

# FACTORS AFFECTING ENTREPRENEURIAL INTENTIONS AND ENTREPRENEURIAL ATTITUDES IN HIGHER EDUCATION

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## ABSTRACT

*Based on the theory of planned behavior and opinion leadership, this study tests the effect of opinion leaders, subjective norms, behavioral control, and course characteristics on the entrepreneurial attitudes and entrepreneurial intentions over the course of educational programs. Based on a longitudinal study during two summer schools offered from the European Institute of Innovation and Technology (EIT) with 84 students, the following results were found. First, the education and environment at these summer schools affect entrepreneurial attitudes as well as entrepreneurial intentions. Second, opinion leadership in entrepreneurship-related topics positively influences changes in pro-entrepreneurial attitudes. Third, entrepreneurial attitudes, subjective norms, and behavioral control propel entrepreneurial intentions. The main theoretical contribution is the synthesis of formerly distinct research fields of planned behavior, entrepreneurship, and opinion leadership. The study also indicates readily applicable practical suggestions to improve entrepreneurship program that intent to improve entrepreneurial attitudes and norms.*

**Keywords:** *Entrepreneurial attitudes, entrepreneurial intentions, opinion leader*

## INTRODUCTION

There is no doubt about the fact that entrepreneurship is important for both the economy and for personal development (Fauziah et al., 2004). Indeed, entrepreneurial activity has a long list of characteristics that serve the common good from the macro down to the micro-level. Entrepreneurship provides employment for many people while ensuring economic growth via taxes, ideas, and innovations. Entrepreneurship provides many opportunities for the development of knowledge and employee skills and motivates and rewards not only on a financial level, but on an individual level as well. According to Hisrich et al. (2005), entrepreneurship is a dynamic process of creating incremental wealth in which the wealth is created by individuals who undertake the risks involved in terms of equity, time, and career. Entrepreneurship is a stepwise process that is influenced by both exogenous and endogenous factors, such as the existence of a business-friendly environment, the availability of the required factor endowments, the ability to acquire desired resources, and the ability to implement and manage the business concept (Mueller, 2008; Morris et al., 2001).

Numerous published studies have been devoted to the entrepreneur personality. An entrepreneur is commonly characterized as an individual with a unique set of instincts, mindset,

inspiration, or vision who has the strengths, willingness, and ability needed to conceptualize ideas and to implement a business plan and who sees change as an opportunity to create value (Cheng et al., 2009). For a long period of time, educators and professionals have been under the delusion that entrepreneurs are born, not made. Later studies have claimed that entrepreneurship can be taught (Dickson et al., 2008; Gorman et al., 1997; Henry et al., 2005a, 2005b; Kirky, 2004).

Indeed, many studies have shown the interaction between entrepreneurship education and entrepreneurial intention (Baybashiya et al., 2011; Fayolle et al., 2005; Hassan and Wafa, 2012; Kolvereid and Moen, 1997; Noel, 2001; Paco et al. 2012; Peterman and Kennedy, 2003; Schlaegel and Koenig, 2014; Tkachev and Kolvereid, 1999; Upton et al., 1995; Webb et al., 1982; Zhang et al., 2014). A positive direct relationship between a university's stimulatory investment in entrepreneurship and the number of students becoming entrepreneurs has also been found (Varela and Jimenez, 2001). A large number of studies address and answer more detailed research questions: (1) Which course characteristics are more effective than others (Mueller, 2008)? (2) Does prior experience matter (Ramayah et al., 2012)? (3) Which program-derived benefits raise entrepreneurial attitudes and intentions (Souitaris et al., 2007)? (4) What is the impact of the educator profile on entrepreneurship education (Steiner, 2013)? However, so far, only a very limited number of studies have considered the personal characteristics of program participants and embedded role models as a possible influence on entrepreneurial attitudes and intentions.

The goal of this study is to empirically test what factors stimulate entrepreneurial attitudes and entrepreneurial intentions during higher education programs using data collected during different summer schools offered by the European Institute of Innovation and Technology (EIT). These five-week-long summer schools were aimed toward raising entrepreneurial attitude and entrepreneurial intention for masters and doctoral (PhD) students in the realm of climate change mitigation and adaptation. In this longitudinal study, we investigated whether entrepreneurial intention may be influenced by different kinds of opinion leaders, role models, course characteristics, entrepreneurial attitudes, subjective norms, and perceived behavioral control. At the same time, we examined exactly what affects the entrepreneurial attitude of the students towards becoming an entrepreneur during these summer schools. The study has two measurement points at the beginning and at the end of the study including 84 students. The tests are examining the differences in attitudes and intentions at these two measurement points depending on the mentioned independent variables.

This study addresses the following research questions: (1) Is the entrepreneurial intention of students positively influenced by entrepreneurial attitude, subjective norms, and perceived behavioral control? (2) What kind of course characteristics impacts the entrepreneurial attitude? (3) Do role models embedded in entrepreneurship courses impact the entrepreneurial attitude? (4) Do opinion leaders affect the entrepreneurial attitude? If yes, to what extent? By considering these questions, our study contributes to the existing literature in three ways. First, this study attempts to synthesize the theory of planned behavior and opinion leadership. Second, this study adds to prior research on entrepreneurship education by testing changes in entrepreneurial intentions and entrepreneurial attitudes caused by different factors over time. And third, this

study is one of the first to consider the role of students as a determinant of success or failure to stimulate entrepreneurial intentions and entrepreneurial attitudes rather than external factors as teachers and environments.

## **THEORETICAL BACKGROUND AND HYPOTHESES**

The origins of entrepreneurship education are in the USA in the aftermath of World War II. After Professor Myles Mace had come into contact with a number of members of the US Army who hoped to start their own businesses, he proposed an educational course at Harvard University that focused on how to start a small business. In 1947, the first course, “Management of Small Enterprises”, was offered to returning World War II veterans. Currently, in most developed countries the biggest challenge for entrepreneurship is a comparatively low intention and a high fear of starting a business.

A common definition is applied internationally for characterizing “Entrepreneurship Development Programs” as “a collection of formalized teachings that informs, trains, and educates anyone interested in participating in socio-economic development through a project to promote entrepreneurship awareness, business creation, and small business development, or to train the trainers” (Berchard and Toulouse, 1998). There are different views regarding the classification of entrepreneurship education (see Table 1). Depending on the objectives of entrepreneurship education, there are different ways to provide the programs. As suggested by Hytti and O’Gorman (2004), providing information through media campaigns and/or seminars and lectures to students across all levels of the education system (primary, secondary, and higher) and to the broader population effectively increases the awareness and understanding of entrepreneurship. The objective of providing practical skills for entrepreneurial activity is fulfilled by providing information through education and training interventions. In the empirical study by Souitaris et al. (2007), the entrepreneurship program is treated as a concept broader than a simple course, as long as it includes a portfolio of complementary activities. The authors suggest that effective programs should consist of four components: (1) a “taught” component, with one or more modules;

(2) a “business-planning” component, which can include business plan competitions and advice on developing a specific business idea; (3) an “interaction with practice” component, which can include talks from practitioners and networking events; and (4) a “university support” component, which can include market research resources, space for meetings, a pool of technology with commercial potential, and even seed funding for teams of students.

Author	Classification	Objectives
Jamieson (1984)	Education about enterprise	Create awareness
	Education for enterprise	Develop practical skills for starting a business
	Education in enterprise	Improve skills for further enterprise development
Laukkennen (2000)	Education about entrepreneurship	Create theoretical knowledge
	Education for entrepreneurship	Develop and encourage entrepreneurial activity
Curran and Stanworth (1989)	Entrepreneurial education	Build practical knowledge for self-employment
	Education for small business ownership and self-employment	Facilitate starting a business with a new product/service
	Continuing small business education	Build upon or update skills
	Small business awareness education	Create awareness

### **Theory of Planned Behavior**

The theory of planned behavior (TPB) is an extension of the theory of reasoned action. Research performed in the behavioral sciences has proven that behavior can be predicted by intentions. According to the TPB, there are three conceptually independent predictors (attitudes) of intention, namely: attitude towards the behavior, subjective norms, and perceived behavioral control. As stated by Ajzen (1991), a general rule of the theory is: “the more favorable the attitude and subjective norm with respect to a behavior, and the greater the perceived behavioral control, the stronger should be an individual’s intention to perform the behavior under consideration.” Notably, Ajzen expects the relative importance of attitude, subjective norm, and perceived behavioral control for the prediction of intention to vary across different behaviors and situations.

The nature of entrepreneurial activity is intention with entrepreneurship being a typical example of such planned, intentional behavior (Kim and Hunter, 1993; Krueger et al., 2000; Mueller, 2008; Souitaris et al., 2007).

In the field of entrepreneurship, TPB was repeatedly tested by using self-employment as the target behavior (Kolvereid, 1996; Krueger et al., 2000; Mueller, 2008; Souitaris et al., 2007). Descriptions of the main TPB constructs in psychology as well as entrepreneurship research are provided in Table 2.

Construct	Psychology research (Ajzen, 1991)	Entrepreneurship research (Kolvereid, 1996)
Intention	Trying to perform a given behavior	State of mind directing a person's attention and action towards self-employment as opposed to organizational employment
Attitude toward the behavior	Degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question	Difference between perceptions of personal desirability in becoming self-employed and organizationally employed
Subjective norm	Perceived social pressure to perform or not to perform the behavior	Perceptions of what important people in respondents' lives think about them becoming self-employed, weighted by the strength of the motivation to comply with these perceptions
Perceived behavioral control	Perceived ease or difficulty of performing the behavior, which is assumed to reflect past experience as well as anticipated impediments and obstacles	Perceived ability to become self-employed

When applying the TPB conceptual model, we strived to find empirical proof that intention is influenced by attitudes in order to assess whether the entrepreneurship program can cause changes in intentions. A relatively dated literature reviews by Gorman et al. (1997) claims that there is little empirical evidence for this. However, recent studies based on the TPB model confirm that there is an evident relationship between entrepreneurship education and entrepreneurial intention that is influenced by attitudes (Schlaegel and Koenig, 2014; Souitaris et al., 2007, Zhang et al., 2014), although the major studies argue that more evidence is still needed. Kolvereid (1996) calls for more studies based on other samples in order to back up the existing findings. Krueger et al. (2000) did not succeed in establishing a relation between intention and subjective norms, and Souitaris et al. (2007) failed to find any effects of educational programs on the change in attitude towards self-employment and perceived behavioral control. In general, there are some criticism on TPB as summarized in Hardeman et al. (2002) and Sniehotta et al. (2014). Consequently, in order to reaffirm the TPB conceptual model and confirm the influence of entrepreneurship education on intention, we pose the following hypotheses:

- Hypothesis 1*     *Pro-entrepreneurial attitudes of individuals positively influence their entrepreneurial intentions.*
- Hypothesis 2*     *Individuals with pro-entrepreneurial subjective norms show an increased level of entrepreneurial intention.*
- Hypothesis 3*     *Pro-entrepreneurial perceived behavioral controls of individuals positively influence their entrepreneurial intentions.*
- Hypothesis 4*     *Participation in the entrepreneurship course positively affects entrepreneurial intentions of individuals and consequently pro-entrepreneurial attitudes, subjective norms, and perceived behavioral controls as well.*

## Course characteristics

According to the conversational framework of Laurillard (2002), the essence of university teaching is an iterative dialogue between the teacher and the student(s). The entire framework operates on two levels: (1) the discursive, theoretical, and conceptual level and (2) the active, practical, and experiential level. The two levels are bridged when students engage in the processes of adaptation (practice in relation to theory) and reflection (theory in the light of practice). Correspondingly, student-oriented courses include the following aspects: (1) discursive elements, such as the sharing of concepts between teachers and students; (2) adaptive elements, which imply that students have the chance to receive feedback and are responsible for considering this feedback in their further studies; (3) interactive elements, which include meaningful intrinsic feedback provided by teachers; and (4) reflective elements, which provide students with the chance to reflect on task goals, act accordingly, receive feedback and relate the feedback to their conception of the topic. The effectiveness of the student-oriented approach was confirmed in an exploratory study by Mueller (2008). The interviewees confirmed the importance of each listed element above by mentioning that discussion and active participation benefitted the aims of entrepreneurship courses. The contrast of student-orientation would be teacher-centered courses with a low level of student involvement. Therefore, we propose the following:

*Hypothesis 5 Student-oriented courses positively influence pro-entrepreneurial attitudes of the participants.*

## Role Models

According to previous research (Bandura, 1997; Carsrud et al., 1987), role models tend to be the basis for increasing entrepreneurial intention. Contact with professionals lends inspiration to the learning process; moreover, one may adopt the role model's attitude if one associates his/her own personality with that of the role model (Elmore, 1991; Krueger et al., 2000; Scott and Twomey, 1988). The exploratory study by Mueller (2008) based on interviews conducted among lecturer's shows that inviting guest speakers (entrepreneurs) is an important feature of entrepreneurial courses. Furthermore, the motivational effect is higher if course participants can identify with the speakers, i.e. if students think to themselves: "If they could do it, I can do it as well". As the same time, the quantitative study by Mueller (2008) proves that courses that provide the opportunity to contact role models with whom students can identify positively influence the entrepreneurial attitude towards founding one's own company. We aim to replicate these results using our data sample and suggest the following:

*Hypothesis 6 The integration of role models into the entrepreneurship program positively influences the pro-entrepreneurial attitude of individuals.*

## Opinion Leadership

The academic study by Martens (1998) illustrates an example of an American non-smoking campaign among young individuals. After having learned that a traditional campaign utilizing brochures results in high expenditures without reasonably successful results, a different approach was used. Opinion leaders within the class were targeted in order to convince the classmates of the hazards of smoking. Ultimately, the second approach was more effective. As previously explained, leadership is based on relationships, is meant to create change, and can be assumed by anyone (Zekan et al., 2012). Several studies in clinical practice and consumer behavior have defined opinion leaders as individuals who, to an extent, influence the opinions, attitudes, beliefs, knowledge, and behaviors of others, and who have demonstrated effectiveness in disseminating information about new ideas and techniques (Potishuk and Kratzer, 2012). Moreover, opinion leaders have special qualities, knowledge, and skills. Previous findings claim that opinion leadership is a two-way interaction and not a generalized trait (Myers and Robertson, 1972). In other words, opinion leaders send and receive information, can influence others, and can be influenced by others. In the case of study programs opinion leaders might appear among class mates. This is a usual case in larger school groups that are determined by opinion leaders (Kratzer and Lettl, 2009).

*Hypothesis 7*      *Individuals with opinion leader characteristics can influence the attitudes of others.*

*Hypothesis 8*      *Individuals who are opinion leaders in entrepreneurship-related topics positively influence changes in pro-entrepreneurial attitudes of other program participants.*

## METHODOLOGY

### Sample

Our sample of 84 students is based on questionnaires completed by participants at the beginning and end of two “The Journey” summer schools initiated in 2012 by the EIT Climate-KIC (Knowledge and Innovation Community). The program “The Journey” is a new and unique initiative of the EIT that is financed by the European Commission aimed to stimulate solution-driven behavior to issues around climate change mitigation and adaptation. Climate-KIC itself is a public-private community initiated and financed by the EIT that focuses on innovation in the area of climate change. One of its key activities is education. “The Journey” aims to foster entrepreneurial thinking by (1) increasing awareness for business opportunities related to climate change, (2) providing the skills and tools to translate business ideas into business solutions to climate change and (3) creating climate change-relevant start-ups. “The Journey” is a five-week intensive climate change innovation and entrepreneurship summer course based in three European locations.

## **Data Collection**

In order to collect the necessary information, the following research method was developed and applied. The participants were asked to fill in ex-ante and ex-post questionnaires when entering and exiting the program, respectively. The data gathering took place during the course and one researcher was always present to distribute and collect the completed forms as well as answering possible questions. Such measures as entrepreneurial intention, entrepreneurial attitude, subjective norms, and perceived behavioral control were measured twice, while the information about the course characteristics and opinion leadership was measured only once, either at the beginning or at the end of the program. The measures are self-reported measure. Heneman (1974) found that self-report measures had less restriction of range and leniency than purportedly more objective supervisor ratings. Since the summer school was executed with changing staff and the students were accompanied only by coaches throughout, we decided to rely on self-reports rather than on supervisor ratings.

## **Measures**

### **Attitude towards Being an Entrepreneur:**

Developed items are based on the measure proposed by Kolvereid (1996) and reflect the reasons for being an entrepreneur or an organizational employee. The following employment choices were considered in the survey questions: (1) being an entrepreneur: economic opportunity (one item), challenge (two items), autonomy (two items), authority (two items), self-realization (one item), participation in the entire process (one item); (2) being employed in organization: security (one item), work load (one item), social environment (one item), avoiding responsibility (one item), and career (one item). Moreover, following Ajzen's (1991) research method, we included three items aimed to evaluate certain behaviors from the perspective of value (doing so is valuable/not valuable) and pleasure (doing so is pleasant/unpleasant). After running the reliability test, one item was excluded. In total, 16 items comprise the scale of attitude with Cronbach's Alpha values of 0.751 and 0.797 for the ex-ante and ex-post questionnaires, respectively. The scale is calculated by extracting the average mean of all item scores.

### **Subjective Norms:**

As a developmental construct for the subjective norms, we have used Ajzen's (1991) suggestions concerning this issue. Direct questions should be asked about the subjective norms of participants. While developing the items for scale, we took into account several important measures such as direct measures (two items), descriptive norms (one item) and motivation to comply (two items). We calculated the scale by summing up the results of the following multiplications: the perceived expectations of the family/others and the motivation to comply with these expectations, as well as the actual behavior of important individuals and the motivation to comply with these people. Finally, the scale reliability was tested using direct

measures and descriptive norms. Consequently, Cronbach's Alpha value is estimated at the level of 0.765 (ex-ante questionnaires) and 0.746 (ex-post questionnaires).

### **Perceived Behavioral Control:**

According to Ajzen (1991), perceived behavioral control reflects the confidence of individuals in their capability to perform the target behavior. A number of different items should reflect the respondent's perceived capability and controllability of performing the behavior. The average sum of seven items comprises the scale with Cronbach's Alpha at 0.761 (ex-ante) and 0.800 (ex-post).

### **Entrepreneurial Intention:**

As with the previously developed scales, we followed Ajzen's recommendations when constructing the TPB questionnaire. In order to measure intention, the use of statements with direct meanings is recommended. The answers should indicate the degree of readiness and willingness to perform the target behavior. Finally, a set of three items make up the scale of entrepreneurial intention with reliability values of 0.858 (ex-ante) and 0.819 (ex-post questionnaire). The scale was calculated by averaging the sum of the item scores.

### **Student Orientation:**

A five-point-scale of student orientation was developed based on previous studies. This scale measures extent to which the entrepreneurship program is teacher or student-centered. The final scale is the mean value of the indices developed by Laurillard (2002) and replicated by Mueller (2008) – namely, discursive (3 items), adaptive (2 items), interactive (8 items), and reflective (3 items) elements. Sixteen questions were posed to the respondents (see Table 3). The reliability test provided a Cronbach's Alpha value of 0.787.

Element	The purpose of the questions
Discursive	Reflects the availability of discussions in the class and the influence of students on the objectives and topics
Adaptive	Reflects the availability of discussions in the class and the adaptability of the objectives and topics according to the student's knowledge
Interactive	Reflects the availability of feedback, encouragement, and support within the class
Reflective	Reflects the availability of emphasis on the advantages and disadvantages of entrepreneurship, and gives consideration to starting the business

### **Role Models:**

Because contact with professionals and family inspires the learning process, the role model scale was developed for measuring the influential effect of guest speakers and entrepreneurs in the class. The students had to indicate to what kind of role models they had

personal contact. The summarized item scores of four questions form the scale. The Cronbach's Alpha value of the variable was 0.796.

### **Opinion Leaders:**

To measure opinion leadership, the self-reposting technique was selected for the following reasons: the method does not require involvement of additional respondents; it is a suitable solution for quantitative studies; and it is the only feasible technique for delimited and uniform social networks that can be usefully applied to networks of professionals and communities with mutual interests (Potishuk and Kratzer, 2012). For measuring opinion leadership among participants, we adopted the scale of Flynn et al. (1996). The scale contains 6 items: importance of the opinion (1 item), authority of the person (2 items), frequency of information given (1 item), and ability to persuade (2 items). Before calculating the scale, we aligned all items with the same direction. Consequently, the lower the total score, then the greater the opinions of the leadership characteristics. The final scale was calculated by averaging the sum of all item scores. The reliability test indicated Cronbach's Alpha to be 0.762 for opinion leadership in climate science and 0.708 for opinion leadership in entrepreneurship.

### **Analytical Techniques**

According to the developed research design, we tested the TPB model at the beginning and the end of the program. Therefore, we could only analyze matched questionnaires (ex-ante and ex-post). 138 questionnaires were completed by the students. All results are presented in Tables 4–8. The means, standard deviations, and bivariate correlations of the sample data are presented in Table 4. The overall correlation shows that all variables could be included in the regression model; none of the variables are highly correlated with each other. We also performed the collinearity diagnostics on all variables as part of the multiple regression procedure. This helped us to verify the problem of multicollinearity, which may not be evident in the correlation matrix, by analyzing the tolerance and variance inflation factor (VIF). Both indicators have values that do not violate the multiple regressions (tolerance >0.10 and VIF % 10). All results designated as statistically significant refer to  $\alpha$  of 0.10 (1-tailed) and 0.05 (2-tailed) or lower.

## **RESULTS**

We used the correlation matrix in order to check the validity of the developed conceptual framework (see Table 4). Every suggested relationship was confirmed. A positive relationship between entrepreneurial intention and attitude, subjective norms, and perceived behavioral control was observed. In order to determine the strength of this correlation, we used the guidelines of Cohen (1988), who suggests the following classification system: small ( $r = 0.10$ – $0.29$ ), medium ( $r = 0.30$ – $0.49$ ), and large ( $r = 0.50$ – $1.0$ ). Therefore, we conclude that at Time 1 (ex-ante), the attitude and subjective norms have a medium relationship with entrepreneurial intention ( $r = 0.370$  and  $r = 0.437$ , respectively), while perceived behavioral control has a large relationship ( $r = 0.574$ ) with entrepreneurial intention. Meanwhile, at Time 2 (ex-post), the attitude and perceived behavioral control have a strong relationship ( $r = 0.506$  and  $r = 0.503$ ,

respectively), while subjective norms have a small relationship ( $r = 0.297$ ) with entrepreneurial intention. Moreover, there is medium positive relationship between difference in attitude and student orientation ( $r = 0.442$ ), role models ( $r = 0.415$ ) and opinion leadership in entrepreneurship ( $r = 0.257$ ).

Hierarchical multiple regression was used to assess the ability of three control measures (attitude, subjective norms, and perceived behavioral control) to predict levels of entrepreneurial intention at two different points in time after controlling for the influence of age and gender (see Table 5). Age and gender were entered at Step 1, explaining 4.1 % of the variance in entrepreneurial intention. After the entry of attitude at Step 2, the total variance explained by the model as a whole was 14 %, ( $F = 8.080$ ,  $p \leq 0.05$ ). During Step 3, the subjective norms were entered and the total variance explained by the model as a whole was 24.9 % ( $F = 11.884$ ,  $p \leq 0.05$ ), and after entering the last variable, the variance explained increased to 47.1 % ( $F = 24.337$ ,  $p \leq 0.05$ ). The three control measures explained an additional 43 % of the variance in entrepreneurial intention. In the final model, only the three control measures were statistically significant, with the attitude unstandardized value of  $B = 0.312$  ( $p \leq 0.1$ ); subjective norms,  $B = 0.027$  ( $p \leq 0.05$ ); and perceived behavioral control,  $B = 0.789$ , ( $p \leq 0.05$ ).

**Table-4**  
**DESCRIPTIVE AND CORRELATION COEFFICIENT**

Variable	Mean	Std. Deviation	Correlation														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Age	25.420	3.582	1	-.003	-.155	-.232**	-.061	.017	-.222**	-.192*	.186*	.258**	-.092	.062	-.123	-.029	-.013
Gender	1.478	0.501	-.003	1	.121	.092	.073	-.108	.087	.133	.142	.121	-.012	-.129	.045	.090	-.018
Attitude ex-ante	2.379	0.459	-.155	.121	1	.508**	.293**	.174*	.243**	.196*	.370*	.315**	-.423**	-.030	.265*	.154	.125
Attitude ex-post	2.245	0.504	-.232**	.092	.508**	1	.194*	.317*	.333**	.391**	.369*	.506**	.565**	.391*	.633*	.391*	-.002
Subjective Norms ex-ante	24.594	11.185	-.061	.073	.293**	.194*	1	.521*	.182*	.112	.437*	.252**	-.081	.024	.035	.101	-.103
Subjective Norms ex-post	23.143	11.577	.017	-.108	.174*	.317**	.521**	1	.000	.217*	.190*	.297**	.169	.259*	.227*	.180*	.097
Perceived Behavioral Control ex-ante	2.944	0.719	-.222**	.087	.243**	.333**	.182*	.000	1	.360**	.574*	.360**	.117	-.056	.190*	.168	-.031
Perceived Behavioral Control ex-post	2.637	0.717	-.192*	.133	.196*	.391**	.112	.217*	.360**	1	.175*	.503**	.222**	.164	.339*	.322*	.030
Entrepreneurial Intention ex-ante	3.074	1.087	-.186*	.142	.370**	.369**	.437**	.190*	.574**	.175*	1	.579**	.034	-.055	.094	.124	-.072

Entrepreneurial Intention ex-post	2.704	1.018	.258**	.121	.315**	.506**	.252**	.297*	.360**	.503**	.579*	1	.227**	.081	.294*	.313*	-.005
Difference in Attitude	-0.137	0.480	-.092	-.012	.423**	.565**	-.081	.169	.117	.222**	.034	.227**	1	.442*	.415*	.257*	-.122
Student Orientation	2.147	0.497	.062	-.129	-.030	.391**	.024	.259*	-.056	.164	-.055	.081	.442**	1	.616*	.101	.146
Role Models	7.466	3.079	-.123	.045	.265**	.633**	.035	.227*	.190*	.339**	.094	.294**	.415**	.616*	1	.164	.070
Opinion Leaders in entrepreneurship	2.786	0.702	-.029	.090	.154	.391**	.101	.180*	.168	.322**	.124	.313**	.257**	.101	.164	1	.164
Opinion Leaders in climate science	2.685	0.702	-.013	-.018	.125	-.002	-.103	.097	-.031	.030	-.072	-.005	-.122	.146	.070	.164	1

\*\*Correlation is significant at the 0.05 level (2-tailed)  
\*Correlation is significant at the 0.1 level (1-tailed)

Ante Dependent Variable Differences in Intention	Step 1	Step 2	Step 3	Step 4
Constant	4.062**	1.994**	1.694**	-.610
Age	-.057**	-.042*	-.039*	-.010
Gender	.302	.221	.181	.124
Attitude		.759**	.526**	.312*
Subjective Norms			.034**	.027**
Perceived Behavioral Control				.789**
F-stat	3.79**	8.080**	11.884**	24.337**
Adjusted R <sup>2</sup>	.041	.140	.249	.471

\*\*Coefficient is significant at the 0.05 level (2-tailed)  
\* Coefficient is significant at the 0.1 level (1-tailed)

The same procedure was applied to test the model at Time 2 using the data collected at the end of the program (see Table 6). Age and gender explained 6.5 % of the variance in entrepreneurial intention. Attitude entered at Step 2 increased the total variance explained by the model as a whole to 26.8 % ( $F = 16.748$ ,  $p < 0.05$ ). In the next step, the subjective norms were added to the model, and the explained variance reached 28.5 % ( $F = 13.835$ ,  $p = 0.05$ ). The last variable entered increased the variance explained by the whole model to 31.6 %, ( $F = 12.942$ ,  $p = 0.05$ ). The three control measures explained an additional 25.1 % of the variance in entrepreneurial intention. In the final model, only the three control measures were statistically significant, with the attitude unstandardized value being  $B = 0.768$  ( $p = 0.05$ ); subjective norms,  $B = 0.012$  ( $p = 0.1$ ); and perceived behavioral control,  $B = 0.300$  ( $p = 0.05$ ).

Post Dependent Variable Differences in Intention	Step 1	Step 2	Step 3	Step 4
Constant	4.089**	1.316*	1.078	.297
Age	-.071**	-.043*	-.041*	-.030
Gender	.268	.208	.185**	.153
Attitude		.949**	.896**	.768**
Subjective Norms			.014	.012*
Perceived Behavioral Control				.300**
F-stat	5.494**	16.748**	13.835**	12.942**
Adjusted R <sup>2</sup>	.065	.268	.285	.316
** Coefficient is significant at the 0.05 level (2-tailed)				
* Coefficient is significant at the 0.1 level (1-tailed)				

The above mentioned regressions tested Hypotheses 1–3, which claim that attitude, subjective norms, and perceived behavioral control have a positive influence on entrepreneurial intention. The results show that among the control variables, only age has a significant impact on entrepreneurial intention. Coefficients are negative in both cases, meaning that younger students have a higher entrepreneurial intention. Meanwhile, gender has no significant influence on the dependent variable. All three independent variables show significant impact on the entrepreneurial intention at both times. Therefore, Hypotheses 1, 2, and 3 are all supported by the results.

A paired-samples t-test was conducted to evaluate the impact of participation in the entrepreneurship course on the entrepreneurial intention of individuals (see Table 7). In order to examine the t-test we reversed the scales of attitude, subjective norms, perceived behavioral control and entrepreneurial intention for better illustrating decreases and increases. A statistically significant increase in attitude scores from Time 1 to Time 2 was observed. The mean increase in attitude scores was 0.137 with a 95 % confidence interval ranging from 0.218 to 0.059. The  $\eta^2$  statistic (0.076) indicates a moderate effect size. At the same time, a statistically significant increase in perceived behavioral control and entrepreneurial intention was observed, with an increased mean of 0.310 and 0.366, respectively. The  $\eta^2$  statistic for both variables shows a moderate effect size (0.127 and 0.125, respectively). We did not identify a significant change in the subjective norms. This may be explained by the fact that subjective norms of participants could not change in such a short period of time (five weeks). Hence, we conclude that Hypothesis 4 is partly supported; meaning that participation in the entrepreneurship program positively affects entrepreneurial intention, pro-entrepreneurial attitude and perceived behavioral control.

Variable	Mean	Std. Deviation	T	$\eta^2$	Sig.
Attitude Post– Attitude Ante	.137	.480	3.339	0.076	0.001
Subjective Norms Post– Subjective Norms Ante	1.648	11.126	1.676	0.022	0.096
Perceived Behavioral Control Post– Perceived Behavioral Control Ante	.310	.814	4.454	0.127	0.000
Entrepreneurial Intention Post– Entrepreneurial Intention Ante	.366	.972	4.343	0.125	0.000

In order to test the remaining hypotheses, we performed a hierarchical regression. The results with respect to differences in attitude due to the participation in the entrepreneurship program are presented in Table 8.

Dependent Variable Differences in Attitude	Step 1	Step 2	Step 3	Step 4	Step 5
Constant	.237	-.394	-.761**	-.426	-.728**
Age	-.013	-.006	-.011	-.012	-.012
Gender	-.031	-.045	.005	.002	-.017
Role Models		.064**	.032**	.031*	.025
Student Orientation			.310**	.342**	.344**
OL Climate				-.138**	-.166**
OL Entrepreneurship					.162**
F-stat	.639	8.881**	9.559**	9.293**	9.711**
Adjusted R <sup>2</sup>	-.006	.154	.208	.242	.287
**Coefficient is significant at the 0.05 level (2-tailed)					
*Coefficient is significant at the 0.1 level (1-tailed)					

Neither age nor gender of participants has any significant impact on the dependent variable. In other words, the regression shows that the explanatory variables concerning the difference in attitude have significantly more variance than the controls. This situation does not change considerably in Models 2, 3, 4, and 5, when all other independent variables are entered. The explained variance of Model 1, at 0.6 %, is very low. After entering the first independent variable role models to Model 2, the explained variance is increased considerably to 15.4 %. These data demonstrate that role models affect the difference in attitude in a positive way with a statistically significant unstandardized coefficient of 0.064 ( $p < 0.05$ ). When entering variable student orientations in Model 3, the explained variance increases significantly to 20.8 %. These data demonstrate that both role models as well as students positively affect differences in attitude ( $p < 0.05$ ). When opinion leadership in climate science was entered into Model 4, 24.2 % of variance was explained. Moreover, the effect of the added variable on the dependent variable is negative ( $p < 0.05$ ). However, more variance is explained when integrating the last independent variable – opinion leadership on entrepreneurship – into Model 5. The explained variance

increases to 28.7 %. These data from this model show that opinion leadership in entrepreneurship has a positive influence on differences in attitude.

Therefore, it can be stated that Hypotheses 5, 6, 7, and 8 are confirmed (Table 9). Firstly, role models integrated in the entrepreneurship program positively influence the pro-entrepreneurial attitude of individuals. Secondly, there is a positive influence of student-oriented courses on the pro-entrepreneurial attitude of the participants. Thirdly, students with opinion leader characteristics can influence the attitudes of other students. Namely, students who are opinion leaders in entrepreneurship-related topics positively influence the change of pro-entrepreneurial attitudes of other program participants.

In summarizing the results, it is observed that all formulated hypotheses are confirmed on the bases of the presented data analysis. Consequently, the TPB conceptual model proposed by Ajzen (1991) can be reaffirmed. In other words, entrepreneurial intention is influenced by attitudes (attitude towards the expected behavior, subjective norms, and perceived behavioral controls). Moreover, entrepreneurial intention, as well as attitude, could move to the pro-entrepreneurial direction due to participation in an entrepreneurship course. We can answer the main research question about the characteristics of the entrepreneurship program that influence the difference of attitudes and the extent to which they do so. Ultimately, all three dimensions of the program have an influence: the nature and methods of student-oriented courses, who the teachers are (role models), and who is being taught (students with opinion leader characteristics) can impact the course output.

Hypotheses		Results	
1	Pro-entrepreneurial attitude	Positively influence	Confirmed
2	Pro-entrepreneurial subjective norms		Confirmed
3	Pro-entrepreneurial perceived behavioral control		Confirmed
4	Participation in entrepreneurship course		Partly Confirmed <sup>1</sup>
5	Role models	Positively influence	Partly Confirmed <sup>2</sup>
6	Student-oriented courses		Confirmed
7	Opinion leaders		Confirmed
8	Opinion leaders in entrepreneurship-related topics		Confirmed

1 The Variable Differences in Subjective Norms was Not Statistically Significant.  
 2 The positive significant effect of role models on pro-entrepreneurial attitudes disappears when entering the variable opinion leaders in entrepreneurship-related topics.

## DISCUSSION AND CONCLUSIONS

Entrepreneurship literature claims that entrepreneurial activity is a typical example of planned behavior. Consequently, it can be stimulated by educational programs that increase the intentions influenced by attitudes (attitude towards the expected behavior, subjective norms, and perceived behavioral controls) of individuals in the pro-entrepreneurship direction. The purpose of this study was to empirically assess the relevance of a previously proposed TPB conceptual framework and determine the role of different entrepreneurship program dimensions (the course itself, the educator, and the learner). With this study, we integrated three rarely intersecting fields: theory of planned behavior, entrepreneurship education, and opinion leadership theory. To address these questions, we applied a pre- and post-test design.

Our results show that the influence of attitudes on the intention has high explanatory power and is extremely relevant for increasing the entrepreneurial intention. This confirms not only traditional research in psychology fields (Ajzen, 1991), but also entrepreneurship research (Mueller, 2008; Souitaris et al., 2007). More accurately, the results indicate that pro-entrepreneurial attitudes, subjective norms, and perceived behavioral controls positively influence the pro-entrepreneurial intention. Therefore, we conclude that the previously proposed TPB model by Ajzen is applicable in explain entrepreneurial activity of individuals. We support the findings of Kolvereid (1996) by replicating the TPB model for self-employment on the data sample collected during the entrepreneurship program “The Journey” (developed and sponsored by EIT Climate-KIC, 2012). Hence, we provide the evidence for a relationship between intention and subjective norms, which did not find support from the sample of Krueger et al. (2000).

When looking at the results in more detail, we concur that entrepreneurship education plays an important role in fostering and promoting entrepreneurship activity. In other words, we provide support for the previously failed findings of Souitaris et al. (2007). Educational programs in entrepreneurship positively affect attitudes toward self-employment, subjective norms, perceived behavioral controls, and entrepreneurial intention. The major findings address the role of different entrepreneurship program dimensions. The results show that all three interactive levels, such as the course itself, the educator, and the learner, have a reasonable influence on the change of attitude toward self-employment. We used student-oriented teaching to investigate the course; therefore, we promote the earlier findings of Mueller (2008) that student-oriented courses are effective and positively influence the pro-entrepreneurial attitude of participants.

The concepts of role models and opinion leaders were applied to the investigation of personal course dimensions such as educator and learner. The findings show that role models increase entrepreneurial intention as long as contact with professionals is inspiring for students, who in turn may easily adopt the behavior of the role models. Therefore, we support numerous studies conducted in this field (Bandura, 1997; Krueger et al., 2000; Mueller, 2008). Last but not least, our findings demonstrate that the student group could be considered as a receiver of provided education as well as the moderator of the course output and that it influences the change towards a pro-entrepreneurial attitude. Based on the theory of opinion leadership and previous research, we suggested that participants of the program with opinion leadership

characteristics can influence the outcome – namely, the attitude towards entrepreneurship. The tested hypotheses about opinion leaders were confirmed. This is in line with the idea of Lau and Ng (2001) that word-of-mouth has a strong influence on the decision-making process and behavior, as long as opinion leaders impact the opinions, attitudes, beliefs, motivations, and behaviors of others (Valente and Pumpuang, 2007).

Indeed, we conclude that the findings of the study provide support for a significant number of effects that are well-known from the traditional entrepreneurship and behavioral science literature, e.g. the importance of entrepreneurship education for influencing the participant's intentions and/or the ability of opinion leaders to influence the attitudes. Furthermore, we added and empirically proved other effects important for the success of the program: namely, participants may influence and shape the learning outcomes just as the course itself or the educators can. The presence of opinion leaders with different competencies among the students shapes the learning outcome positively.

All of the above statements allow us to conclude that this study offers theoretical insights and practical implications. The main theoretical contribution is the synthesis of formerly distinct research fields of planned behavior, entrepreneurship, and opinion leadership. We consider our study to be a promising starting point for lending more attention to opinion leadership research among entrepreneurship learners in the future. The evidence of the relationship between intention and attitudes (attitude towards self-employment, subjective norms and perceived behavioral control) offers scientific input to the theory of planned behavior. Moreover, the results reassert that entrepreneurship can be promoted with the help of entrepreneurship education. Also, this study adds to the theory of opinion leadership by justifying the importance of different program dimensions needed for success and by empirically showing the influence of opinion leaders on the program outcomes.

From the practical perspective, the knowledge that entrepreneurship education influences entrepreneurial intention and a better understanding of this process will help to answer questions regarding the necessity of entrepreneurship programs, their structure, and teaching methods, and will enable more success by increasing awareness about the participants' characteristics. So far, the knowledge about the relationship of the course characteristics as well as the attitudes and intentions of participants can directly guide the program design at the early developmental stages and can help to review and improve it. Since the results show that student-oriented courses have a positive effect on entrepreneurial intention, the course creators can follow these guidelines and implement such learning techniques. As long as role models impact attitudes, it is reasonable to devote extra energy to choosing the educators, lecturers, and guests or speakers who can serve as role models. The group of participants was shown to be an important issue for the overall success of the program. Being conscious of opinion leaders in the group and their spheres of influence is the next point for an effective entrepreneurship program, as long as opinion leadership is a two-way phenomenon, meaning that people who influence others are, in turn, influenced by others in the same topic area (Myers and Robertson, 1972).

## LIMITATIONS

Despite the numerous contributions offered by this study, it has limitations and a number of unaddressed questions. In our view, the biggest issue in this case is the aspect of time. Though we discussed the promotion of entrepreneurship and demonstrated an increase of entrepreneurial activity as a result of education, the study only addresses the attitudes and intentions toward expected behavior and not the behavior itself. That means that the time-lag problem has not been solved. Although there are behavioral changes as part of the summer school, these cannot be measured within a time-line of five weeks. Therefore future research should design studies that cover time in longer perspectives.

The second issue is the sample size. The sample size was large enough to acquire significant results, although in order to solidify the findings, a larger number of programs and respondents needs to be utilized. Moreover, the data was gathered solely during the 2012 Climate-KIC entrepreneurship program “The Journey”. The group of participants was randomly formed; however, all students were from Climate-KIC-related universities. Studies beyond that sample could additionally confirm the results found.

Third, the single effects on attitudes, intentions and perhaps norms should be studied in more detail. This is very relevant in designing study programs on entrepreneurship in the future. In addition, future research studies might concentrate also on more experimental designs and include control groups into their design. At all, the research should be done beyond European educational programs to increase the generalizability of results and maybe to reveal some cultural differences. Only more empirical evidence allows to structure programs and learning methods in the way that the expected learning objectives (changes in attitudes, intentions and behaviors) may happen. The last one is what really matters to education.

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