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# Panel study of entrepreneurial intentions of higher education students

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## Abstract

Entrepreneurial intentions have been extensively researched among higher education students (e.g. Wang & Wong, 2004; Wu & Wu, 2008; Vrdoljak & Dulcic, 2011). The biggest research gap has been in longitudinal settings (e.g. Matlay & Carey, 2007; Fayolle & Liñán, 2013). The present study contributes to narrowing this gap by focusing on changes in entrepreneurial intentions during studies. The specific objectives are twofold: (1) to analyse the change in higher education students' entrepreneurial intentions from the first year of studies until graduation; and (2) to examine the effect of gender and entrepreneurship pedagogy on the development of entrepreneurial intentions.

The data used in the study comes from Finland. The population of our study is made of participants from five universities in six different study fields. The data was collected using a self-administered questionnaire in 2009, and in 2011 and 2012. Thus, our data covers the whole study period from the first to the last year. For the analysis we accepted those individuals who had answered in at least two waves. In our data there are 62 individuals with responses from all three data collection waves and 149 individuals with two measurement waves. The change of entrepreneurial intentions was analyzed with linear regression.

The results show that entrepreneurial intentions decrease significantly during studies. With male students, the intentions do not decrease as severely as with female students. Female students start with a lower level of entrepreneurial intentions and their intentions develop more negatively than male students' intentions. Students who participated in entrepreneurial courses with active modes of teaching had higher values of entrepreneurial intentions in the beginning than other students. However, both groups show a negative development in entrepreneurial intentions. Linear regression analysis shows that the changes in perceived behavioral control, in entrepreneurial attitudes and in subjective norm have an effect on the development of intentions. Also gender has an effect on the development. The most significant variable in the model is the change in perceived behavioral control followed by the change in attitudes.

## Keywords

Entrepreneurial intentions, higher education students, longitudinal research, Theory of Planned Behavior, entrepreneurship pedagogy.

## 1 Introduction

Entrepreneurial intentions have been extensively researched among higher education students (e.g. Wang & Wong, 2004; Wu & Wu, 2008; Vrdoljak & Dulcic, 2011). The biggest research gap has been in longitudinal settings (e.g. Matlay & Carey, 2007; Fayolle & Liñán, 2013). The present study contributes to narrowing this gap by focusing on changes in entrepreneurial intentions during studies. The research setting in this paper is unique:

we measure higher education students' entrepreneurial intentions and their antecedents three times during studies from the first study year until graduation year.

In order to study the development in entrepreneurial intentions and their antecedents, we adopt an existing intention model, Theory of Planned Behavior (TPB) by Ajzen (1991). TPB suggests that intention is the immediate antecedent of behavior. The core of the TPB is the idea that intentions have three conceptually independent determinants, namely attitude towards the behavior, subjective norm and perceived behavioral control.

Previous research shows that women have lower entrepreneurial intentions and less desire to start new businesses than men (e.g. Linan & Chen, 2009). Joensuu et al. (2013) showed in their longitudinal research that there is a gender difference in the initial level of entrepreneurial intentions and how intentions develop over time. Entrepreneurial pedagogy can also have an effect on the development of entrepreneurial intentions. Majority of arguments favour various active modes of learning, largely drawing upon studies on entrepreneurs' learning (e.g. Higgins and Elliott, 2010).

The specific objectives for this study are twofold: (1) to analyse the change in higher education students' entrepreneurial intentions from the first year of studies until graduation; and (2) to examine the effect of gender and entrepreneurship pedagogy on the development of entrepreneurial intentions.

The structure of this paper is as follows: chapter 2 presents the literature review for the study. Chapter 3 deals with the research methodology and chapter 4 presents the findings. Finally, the conclusions and limitations of the study are presented in chapter 5.

## **2 Literature review**

### **Entrepreneurial intentions and their antecedents**

TPB (Ajzen 1991) suggests that intention is the immediate antecedent of behavior and, thus, the stronger the intention to engage in specific behavior, the more likely should be its actual performance. The intention to conduct a certain behavior has been noticed to be one of the strongest predictors of given behavior (Fishbein & Ajzen, 1975; Bagozzi et al., 1989; Krueger & Carsrud, 1993). The TPB-model has been widely used, tested, developed and criticized in different contexts (Armitage & Conner, 2001; Sheeran, 2002). The model has been utilized often within entrepreneurship research and with student populations (e.g. Krueger & Carsrud, 1993; Krueger et al., 2000; Barbosa et al., 2006). The core of the TPB is the idea that intentions have three conceptually independent determinants, namely attitude towards the behavior, subjective norm and perceived behavioral control (Ajzen 1991, 188).

Attitude towards the behavior refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question. The more positive an individual's perception regarding the outcome of starting a business is (see e.g. Krueger et al., 2000; Segal et al., 2005; van Gelderen & Jansen, 2006; Pruett et al., 2009) the more

favourable their attitude towards that behavior should be and, consequently, the stronger the individual's intention to go ahead and start a business should be.

Subjective norm refers to the perceived social pressure to perform or not to perform a behavior, i.e. starting a business. Subjective norm is based on beliefs concerning whether important referent individuals or groups approve or disapprove of an individual establishing a business, and to what extent this approval or disapproval matters to the individual (Ajzen, 1991, p. 195).

Perceived behavioral control refers to the perceived ease or difficulty of performing the behavior. It is based on beliefs regarding the presence or absence of requisite resources and opportunities for performing a given behavior (see Bandura et al., 1980; Swan et al., 2007). According to Ajzen (1991) this is most compatible with Bandura's (1980) concept of perceived self-efficacy. In entrepreneurial intention literature, perceived behavioral control and entrepreneurial self-efficacy have been used almost interchangeably (Schlaegel & Koenig, 2014).

In most of the studies the best predictor of intentions has been perceived behavioral control (Kristiansen and Indarti, 2004; Liñán, 2004; Henley, 2005; Segal et al., 2005; Urban, 2006; Sequeira et al., 2007; Wilson et al., 2007; Prodan and Drnovsek, 2010; Chen and He, 2011; Drost and McGuire, 2011; Finisterra Do Paco et al., 2011; Lee et al., 2011; Lope Pihie and Bagheri, 2011). The second-most common predictor has been attitudes (Zampetakis et al., 2009; Moi et al., 2011) followed by subjective norm (Aizzat et al., 2009; Lope, et al., 2009; Engle et al., 2010; Siu and Lo, 2013). Kautonen, van Gelderen and Fink (2013) found that attitude, subjective norm and perceived behavioral control jointly explain 59 percent of the variation in intention. In a recent meta-analysis, perceived behavioral control had significantly larger effect size than either attitude or subjective norm (Schlaegel and Koenig, 2014).

### **Development of entrepreneurial intentions**

Few longitudinal studies exist concerning the development of entrepreneurial intention. Joensuu et al. (2014) found in their research that entrepreneurial intentions decreased during studies among higher education students. This tendency was found in all study fields. Also other studies have shown negative development of entrepreneurial intentions during studies (e.g. Fayolle et al., 2005; Henley, 2007; Pihkala, 2008; Wu & Wu, 2008; Nabi et al., 2010). In the study of Joensuu et al. (2014) the development of entrepreneurial intentions was predicted by change in perceived behavioral control, change in attitudes and finally by change in subjective norm.

Based on previous research we suggest the following hypotheses:

*Hypothesis 1: Entrepreneurial intentions decrease during studies and after graduation.*

*Hypothesis 2: The changes in perceived behavioral control, in entrepreneurial attitudes and in subjective norm have an effect on the development on intentions.*

## **Gender**

The effect of gender has received considerable attention in previous entrepreneurial studies (Fayolle and Liñán, 2013). Previous research shows that women have lower entrepreneurial intentions and less desire to start new businesses than men (e.g. Wang and Wong, 2004; Wilson et al., 2004; Shay and Terjesen, 2005; Linan and Chen, 2009), although not all studies have found correlation between gender and entrepreneurial intentions (Pruett et al., 2009; Yordanova and Tarrazon, 2010). Joensuu et al. (2013) found a gender effect also in the development of entrepreneurial intentions: men had more positive development trends in entrepreneurial intentions than female. The initial levels of entrepreneurial intentions were more positive among male students than female students.

Based on previous findings we suggest following hypothesis:

*Hypothesis 3: The development of entrepreneurial intentions is more positive with men than with women.*

## **Entrepreneurship education and mode of teaching**

A variety of methods are employed in entrepreneurship education (e.g. Hytti and O’Gorman, 2004), but despite long debate there is no universally accepted pedagogical recipe for teaching entrepreneurship (Fayolle and Gailly, 2008). Hannon (2006) posits that no single philosophy, conception or model is likely to meet the broad scope of the field. Majority of arguments, however, favour various active modes of learning, largely drawing upon studies on entrepreneurs’ learning (e.g. Pittaway and Cope, 2007a; Higgins and Elliott, 2010; Pittaway and Thorpe, 2012). The assumption is that conventional (e.g. lecture based) teaching methods can neither convey the complexities of entrepreneurship nor prepare a student for it. Neck and Greene (2011), promoting the view of entrepreneurship as a method rather than a process, argue that entrepreneurship requires an approach based on action and practice, particularly within a formal education structure.

Hytti and O’Gorman (2004) refer to ‘action learning methods’ in which students take the primary role, and traditional methods such as lectures, exams and essays. Walter and Dohse (2012) in turn contrast reflective modes, where knowledge is acquired through reflective observation, with active modes involving active experimentation. Despite theoretical and pragmatic argumentation in favor of active modes (e.g. Henry and Treanor, 2012; Neck and Greene, 2011; van Gelderen, 2010; Walter et al., 2010), their greater effectiveness remains to be empirically demonstrated. Pittaway and Cope (2007b) call for comparative longitudinal studies to evaluate pedagogies. We have not identified longitudinal studies on individual level comparing the impacts of different teaching modes (i.e. active-based and lecture-based teaching) on entrepreneurial intentions and their antecedents. An exception to this is the study by Walter and Dohse (2012), showing that active modes of entrepreneurship education are positively related to self-employment intentions

in all regional contexts, whereas the effectiveness of reflective modes is moderated by regional context.

Based on previous research, we suggest following hypothesis:

*Hypothesis 4: Active modes of teaching in entrepreneurial courses have a positive effect on the development of entrepreneurial intentions.*

### **3 Research methodology**

The data used in the study comes from Finland. The population of our study is made of participants from five universities in six different study fields. The data was collected with a self-administered questionnaire for the first time in fall 2009, and the collection was repeated in 2011 and 2012. Hence, our data covers the whole study period from the first to the last year. For the analysis we accepted the individuals for whom we have answers in at least two waves. In our data there are 62 individuals with responses from all three data collection waves and 149 individuals with two measurement waves. 62 percent of the respondents were female. 66 percent had participated in entrepreneurial courses with active modes on teaching. Majority of the respondents were studying in the field of Social services, Health and Sports (49 %) or in the field of Technology (20 %). Other study fields were Natural Sources and the Environment (15 %), Culture (12 %), Social sciences, Business and Administration (3 %), and Tourism, Catering and Domestic Services (1 %).

#### **Variables**

Entrepreneurial intention was measured with eight items using 7-point likert scale. Subjective norm was measured with two sets of items: originally the support from persons close to the individual (belief items) was measured with three items (seven-point scale from 1 to 7) and motivation to comply was measured by three items (seven-point scale from 1 to 7) referring to each of the aforementioned belief questions (three items). For statistical analysis the motivation to comply items were transformed to -3 - +3 scale. The belief based items (coded as ranging from 1 to 7) and the corresponding motivation to comply items (coded as ranging from -3 to +3) were multiplied, and then added to create an index of Subjective Norm (ranging from -63 to +63). This coding is based on Ajzen (1991). He suggests that the strength of each normative belief is multiplied by the person's motivation to comply with the referent in question, and the subjective norm (SN) is directly proportional to the sum of the resulting products across the salient referents. Perceived Behavioral Control was measured with five items using 7-point likert scale. Attitudes were measured with nine items using 7-point likert scale.

Gender was coded as zero for female students and one for male students. Participation only in entrepreneurship courses with passive modes on teaching (only lectures) was coded as zero and participation in entrepreneurship courses with active modes on teaching

(addition to lectures also project work, cooperation with entrepreneurs, virtual enterprises etc.) was coded as one.

Table 1 presents correlations, Cronbach's alphas, minimum and maximum scores, means and standard deviations for the scales (EI=entrepreneurial intentions, SN=subjective norm, PBC=perceived behavioral control, ATT=attitudes).

*Table 1. Correlations, Cronbach's alphas, range, means and standard deviations for the scales.*

	EI	SN	PBC	ATT
EI	1			
SN	.19*	1		
PBC	.63***	.08	1	
ATT	.60***	.17*	.47***	1
Cronbach's alpha	0.85	0.78	0.77	0.84
Range	1.0-6.9	-48-63	1.2-6.4	1.4-6.9
Mean	3.5	-1.8	4.2	5.0
Sd	1.1	16.4	1.0	0.9

According to Tabachnick and Fidell (1996) the independent variables with a bivariate correlation more than .70 should not be included in multiple regression analysis. Although correlations are quite high between some variables (ATT and PBC), this does not exceed this cut value. Tolerance and VIF-values were also analyzed to see that there was not a threat of multicollinearity between independent variables. The skewness and kurtosis values were also checked for the normality of scales.

The data was analyzed using t-tests and logistic regression analysis with SPSS 21. The change was analyzed by using difference score with multiple linear regression modeling. For linear regression analysis, we calculated difference scores for each of the main variables of the TPB model (entrepreneurial intention, subjective norm, entrepreneurial attitudes, perceived behavioral control). For this we used 2-wave data (the measurement from 1<sup>st</sup> study year and 4<sup>th</sup> study year). Clarke (2004) states that it is common to use the difference score when studying change from 2-wave data. As such, we investigated whether changes in intentions were the result of changes in attitudes, in subjective norm and in perceived behavioral control. Gender and entrepreneurial education pedagogy were added in the model.

## 4 Results

Table 2 presents the development of means of entrepreneurial intentions. Intentions decrease significantly during studies. The mean of entrepreneurial intentions is 3.5 in the

first study year and 3.0 in the graduation year. Hypothesis 1 is supported. With male students, entrepreneurial intentions do not decrease as severely as with female students. The mean of entrepreneurial intentions with male students is 3.6 in the beginning of studies and 3.4 in the graduation year. Female students start with a lower level of entrepreneurial intentions (3.4) and intentions develop more negatively than with men (2.8 in the graduation year). Hypothesis 3 is supported. Students who participated in entrepreneurial courses with active modes of teaching had higher values of entrepreneurial intentions in the beginning (3.7) versus other students (3.4). However, both groups show a negative development in the mean values of entrepreneurial intentions. Hypothesis 4 is not supported.

*Table 2. The development of Entrepreneurial intention (means and standard deviations).*

	EI 1 <sup>st</sup> study year	EI 3 <sup>rd</sup> study year	EI 4 <sup>th</sup> study year	Sig. between initial level and final level of EI
All students	3.5 (1.1)	3.3 (1.3)	3.0 (1.3)	***
Men	3.6 (1.2)	3.4 (1.4)	3.4 (1.3)	*
Women	3.4 (1.1)	3.2 (1.2)	2.8 (1.2)	***
Participation in EE coursis with active modes on teaching	3.7 (1.1)	3.5 (1.1)	3.2 (1.1)	***
Participation in EE coursis with only passive modes on teaching	3.4 (1.3)	3.2 (1.4)	2.9 (1.5)	**

\* p< .05. \*\* p< .01. \*\*\* p<.001

Table 3 presents the results from the linear regression analysis. As can be seen from the table, the changes in perceived behavioral control, in entrepreneurial attitudes and in subjective norm have an effect on the development on intentions. Also gender has an effect on the development. Hypothesis 2 is supported. The whole model explains 26 percent of the variance of the change in entrepreneurial intentions. The most significant variable in the model is the change in perceived behavioral control followed by the change in attitudes.

*Table 3. The Linear regression analysis of the change in entrepreneurial intentions.*

<b>Independent variables</b>	
Gender (male)	$\beta$ 0.22**



Participation in entrepreneurial courses with active mode	$\beta$ -0.05
Change in PBC	$\beta$ 0.31***
Change in ATT	$\beta$ 0.27**
Change in SN	$\beta$ 0.17*
<b>Model fit statistics</b>	
Adjusted R <sup>2</sup>	0.26
F-statistics	9.575***

\* p < .05. \*\* p < .01. \*\*\* p < .001 Standardized coefficients reported.

## 5 Conclusions

The first objective of this study was to analyse the change in higher education students' entrepreneurial intentions from the first year of studies until graduation. Entrepreneurial intentions of a higher education student decrease during studies. This is in line with previous research (Fayolle et al., 2005; Henley, 2007; Pihkala, 2008; Wu and Wu, 2008; Nabi et al., 2010). It seems that individuals at the beginning of their studies have greater self-confidence for and greater interest in starting their own businesses than they do after studying three years. The results are not very promising from the point of view of formation of entrepreneurial intention in higher education. However, it isn't untypical for people to overrate their intention to perform a distant action. Hence, a 1st year student may overrate his intent to start a business after graduation, whereas in the graduation year, the student is more realistic about his intentions.

Change in attitudes, subjective norm and perceived behavioral control have an effect on the development of entrepreneurial intentions. This shows that Ajzen's (1991) theory of planned behavior is working also in a longitudinal setting. It is encouraging to note that attitudes and perceived behavioral control – both factors at least theoretically within the scope of influence of education programs – contribute to change in entrepreneurial intentions. This signifies that in order to increase entrepreneurial potential, we should focus on improving the knowledge base of young people (to change their attitudes) and place young people into pedagogical situations where they can develop their skills and competencies in entrepreneurship related tasks (to improve their perceived behavior control).

The second objective of the study was to examine the effect of gender and entrepreneurship pedagogy on the development in entrepreneurial intentions. Our empirical observations clearly demonstrate a gender difference in both initial level of intentions and the way in which intentions evolve over time. Men have a higher level of entrepreneurial intention in the beginning of the studies and their intentions develop less negatively than the intentions of women do. The same gender effect have also been found in previous studies (Joensuu et al., 2013).

In this study, active modes in entrepreneurship pedagogy did not have an effect on the development of entrepreneurial intentions. Students who participated in entrepreneurship courses with active teaching modes had higher entrepreneurial intentions in the beginning of the studies and also in the graduation year than other students, but their intentions

developed negatively during studies. Entrepreneurship courses with active teaching modes were not able to sustain the students' initial level of entrepreneurial intention. It may be that other factors have more effect on the development of intentions that it is a real challenge for higher education to foster entrepreneurship. It should also be noticed that despite of the results there are many other arguments that favour active modes. The most important is actual learning (e.g. Pittaway and Cope, 2007a; Higgins and Elliott, 2010; Pittaway and Thorpe, 2012). It may also be that active modes in entrepreneurship courses have an indirect effect on the development of entrepreneurial intentions. In fact, Varamäki et al. (2015) found a direct effect of versatile teaching methods in entrepreneurship courses on the development of attitudes related to entrepreneurship. The change in attitudes has a direct effect on the change in entrepreneurial intentions; if we can affect attitudes, we can affect the development of entrepreneurial intentions.

It is also possible that students with higher intentions are more likely to include active entrepreneurship courses in their personal curriculum than other, less interested students. Our data does not extent to whether the courses attended by respondents were elective or compulsory. However, as all the universities in the study include entrepreneurship competences as a learning outcome in their degree education, there is reason to believe that entrepreneurship courses are, at least to a degree, compulsory.

Future studies could explore why the level of intentions among women decreases more than males. It might well be that there are difference in the way women and men learn in higher educational setting.

All in all, despite the formidable challenges of longitudinal data collection (see e.g. Harte and Stewart, 2010; Joensuu et al., 2013) a serious effort should be made to extent longitudinal studies to actual behavior, i.e. realization of intentions (see also Liñán and Fayolle, 2015). This would entail following up on changes of intentions during studies and then their actualization in actions either during studies or after graduations. Additionally, deeper attention should be paid to future studies that link intentions and starting the start-up process. Liñán and Fayolle (2015) have suggested that implementation intention theory and the concept of commitment should be included when analyzing the link between intentions and behavior.

### **Limitations**

There are some limitations concerning this study. The first is the data size and the loss of data in a longitudinal setting. Also the majority of the respondents were studying in the field of Social services, Health and Sports or in the field of Technology, which can have an effect on the results. The context (Finnish higher education system) should be remembered when interpreting the results.

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