

## Innovativeness as a driving force for future entrepreneurs- comparison of US and European students

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### Keywords

Entrepreneurship, Innovativeness, Psychological Capital, Entrepreneurial camp

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### Abstract

*Here the interest was to see entrepreneurial intentions and innovativeness and proactiveness levels of US and European students, after they finished their intensive three weeks innovation and entrepreneurial camp. 180 participants answered the questionnaire during the last week of the camp. The focus of this study is to see the impact of innovation on entrepreneurial intentions. Also, the impact of the camp was studied to see a decrease or increase in participants' psychological capital. Additionally cultural differences between US and European students were studied. The results indicated that innovativeness was related to entrepreneurial intentions and students gained higher level of psychological capital due to camp. Cultural differences indicated that US students were improving more their psychological capital at the camp, and they were more proactive than European. In case of entrepreneurial intentions there were no differences between Europe and US. Results are discussed in terms of pedagogical approaches and cultural differences.*

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### Introduction

Entrepreneurship has typically related to characteristics like risk-taking, innovativeness and competitiveness. There are plenty of studies indicating that risk-taking attitudes and behaviors are distinguishing characteristics of entrepreneurship (e.g. Das & Teng, 1997; Douglas & Shepherd, 2002; Stewart et al., 1998). Studies show that innovativeness is a crucial factor impacting entrepreneurial intentions (e.g., Brandt et al., 2025; Harris & Gibson, 2008).

Psychological capital (PsyCap) illustrates individuals' positive capacity in terms of the components of optimism, resilience, self-efficacy, and hope (Luthans et al., 2006), which all could be regarded as needed qualities and attitudes for entrepreneurs. And indeed, some studies indicate positive relationship of psychological capital and entrepreneurship (e.g., Akmaliah & Pihie, 2009; Saeid et al., 2011). Overall psychological capital has been found to have several positive impacts on individuals' life at organizations and work-related matters (Avey et al., 2011; Luthans et al., 2005; Luthans et al., 2008; Peterson et al., 2011). It is not permanent trait, like personality, when it can be increased with interventions. For example, 1-4 hours micro-interventions have been noted to have positive impact on the participants' psychological capital (Lupsa et al., 2019). Interestingly, leaders' have impact on their team members' psychological capital and psychological safety plays a role on individual's level of psychological capital (Brandt, 2022; Brandt & Rinne, 2024).

Here this study focuses on the relationship of innovativeness and entrepreneurial intentions and impact of entrepreneurial camp on the participants' psychological capital. Also, interest is to compare USA and European students in these perspectives. As previous studies indicate culture has direct and indirect effects on different dimensions of entrepreneurship (Amway Global Entrepreneurship Report, 2013; Gonzales-Serrano et al., 2018).

### **Entrepreneurial intentions**

The Theory of Planned Behavior (TPB) (Ajzen, 1991) is one of the models in the study of entrepreneurial intent in different countries (Autio et al., 2001; González-Serrano et al., 2016; Krueger et al., 2000; Liñán & Fayolle, 2015; Moriano et al., 2012). Ajzen (1991) postulates that behavior is a function of beliefs that influence a certain behavior. These beliefs are considered important premises that determine personal attitude, intention and perceived behavior control. The more favorable the subjective norms and attitudes towards behavior, the greater the perceived degree of control of the individual, leading to a stronger intention to perform a certain behavior (Ajzen, 1991). Previous studies have used TPB to predict certain variables that are related to entrepreneurship. These variables include entrepreneurial intentions, entrepreneurial behavior and entrepreneurial skills and attitudes. Entrepreneurial intention is the “self-acknowledged conviction by a person that they intend to set up a new business venture and consciously plan to do so at some point in the future” (Thompson, 2009, p. 676). Entrepreneurial intention is the first step towards taking entrepreneurial action such as contemplating a start-up. The second variable of interest is entrepreneurial behavior. Based on the TPB, intentions are correlated with behavior and linked to behavioral control. Intention plays a central role in TPB by connecting norms, attitudes and behavioral control with enacted behaviors.

### **Entrepreneurial qualities and innovativeness**

Entrepreneurial qualities have typically been related to ability to take risks (Frishamme & Andersson, 2009) and various research indicates this (e.g. Begley & Boyd, 1987; Carland et al, 1995; Karabey 2012; Zhang et al, 2015). Other authors have shown that highly risk-minded entrepreneurs are generally willing to take on high-risk ventures for the chance of high returns (Covin & Slevin, 1989). Some research indicates that with risk-taking ability the need for autonomy in decision making is also needed. The stronger the risk-taking tolerance of the individual has, and the stronger is their preference for decision-making autonomy, the stronger is their intention to be self-employed (Douglas & Shepherd, 2002). The intervention study indicated that people could learn to take risks (Kyrö & Tapani, 2008). Researchers studying students used a variety of measures for entrepreneurial attitudes that included a mixture of attitude and trait measures, often including items referencing risk-taking and innovativeness (Langkamp-Bolton & Lane, 2011; Levenburg & Schwarz, 2008; Macko & Tyszka, 2009; Zampetakis et al., 2009) as well as proactivity (Langkamp-Bolton & Lane, 2011; Zampetakis et al., 2009).

Earlier research suggests that psychological and personality characteristics are the main drivers that predict individuals’ innovativeness. While some believe most individuals can be innovative, creating new ideas is easier for some. For example, Rogers (1962) regarded innovativeness as a context-consistent personality trait. Other scholars meanwhile have argued that innovativeness is influenced by a variety of personality traits and sociological characteristics (Midgley & Dowling, 1978). Despite these differing viewpoints, both approaches maintain that innovativeness, whether conceptualized as a personality trait or adoption to innovations, is to anticipate and influence innovative behavior (Sternberg & Shoham, 2022).

In a business setting, a preference for innovation refers to a willingness and inclination toward experimentation and creativity when developing and introducing new products and services (Lumpkin & Dess, 2001). Therefore, in business settings the innovation process and performance indicators have been studied widely (Nappi & Kelly; 2022). Innovation also needs proactivity, as proactive individuals scan the environment for opportunities, show initiative, and persevere until they bring about change (Bateman & Crant, 1993).

Studies indicate that innovative individuals are persistent (Hurt et al., 1977; Sandberg et al., 2013), self-confident, open to experience, original, independent, and have tolerance for ambiguity (Barron & Harrington, 1981; George & Zhou, 2001; Patterson, 1999; West & Wallace, 1991). Innovators are also willing to change (Hurt et al., 1977), have innovative consumer and employee behavior (Sternberg and Shoham, 2022), are eager to try new ideas (Rogers & Shoemaker, 1971), and exhibit a propensity towards problem-solving (Scott & Bruce, 1994). Additionally, they can inspire others and build networks (Akrich et al., 2002). Regarding personality, studies have found positive correlations between openness, extraversion, and creativity (Bender et al., 2013; Hughes et al., 2013). These layers of innovativeness

enhance the ability of entrepreneurs to seize these opportunities and convert them into successful ventures. Extant literature consistently highlights the positive relationship between innovativeness and entrepreneurial orientation (Umar et al., 2018), in addition to risk-taking, proactiveness, autonomy, and competitive aggressiveness (Covin & Slevin, 1991).

Innovativeness allows entrepreneurs to differentiate themselves, attract customers, and create value in dynamic and competitive business environments. For example, Harris and Gibson (2008) found that personal control, innovation, self-esteem, and achievement concerning business involvement were correlated with intentions to become an entrepreneur. Similarly, Florin et al. (2007) have studied student attitudes promoting entrepreneurship and found that innovation, nonconformity, proactive disposition, self-efficacy, and achievement motivation are crucial. Other researchers studying students used a variety of measures for entrepreneurial attitudes that included a mixture of attitude and trait measures, often including items referencing risk-taking and innovativeness (Langkamp-Bolton & Lane, 2011; Levenburg & Schwarz, 2008; Macko & Tyszka, 2009; Zampetakis et al., 2009) as well as proactivity (Langkamp-Bolton & Lane, 2011; Zampetakis et al., 2009). These qualities are required for entrepreneurs, both students and non-students, to successfully undertake entrepreneurial ventures (Wahee et al., 2022). Entrepreneurial orientation represents the strategic mindset and behavior of individuals, or indeed organizations, that engage in entrepreneurial activities, of which innovativeness is a central dimension. The study by Brandt et al., (2025) shows that innovativeness is crucial factor in entrepreneurial intentions at individual level, however also culture has impact on that.

### **Psychological capital and entrepreneurial tendencies**

A comprehensive definition of Psychological capital (PsyCap) is “an individual’s positive psychological state of development that is characterized by: (1) having confidence (self-efficacy) to take on and put in the necessary effort to succeed at challenging tasks; (2) making a positive attribution (optimism) about succeeding now and in the future; (3) persevering toward goals and, when necessary, redirecting paths to goals (hope) in order to succeed; and (4) when beset by problems and adversity, sustaining and bouncing back and even beyond (resilience) to attain success” (Luthans et al., 2007, p. 3).

In working life, it has been noted that psychological capital has a huge impact on the individuals’ experiences and success. There are multiple studies of its positive impacts on individuals’ life at organizations and work-related matters (Avey et al., 2011; Bergheim et al, 2015; Luthans et al, 2008; Peterson et al, 2011). For example, Karatepe and Karadas (2015) found that employees scoring high on psychological capital are more satisfied with their jobs, careers, and lives. It has also been associated with positive career mobility (Järlström & Brandt, 2017) and objective career success measured in wages and hierarchical career progression (Järlström et al, 2020). At the organizational level, it is connected to organizational performance (Hmieleski & Carr, 2008), business excellence (Hsu et al., 2014) and competitive advantage (Youssef & Luthans, 2010).

In relationship with entrepreneurship, psychological capital seems to have also positive connection. According to the study of Contreras et al. (2017) with the sample of 100 persons, the results indicate that entrepreneurial intention is related to psychological capital with dimensions of self-efficacy and resilience and as an integrated construct. A study by Ebhrem et al (2019) highlighted the importance of psychological capital in explaining why some students are more willing to start-up business than others. Indeed, the higher the student’s psychological capital, the higher the intention to start-up a business. Further, according to study of Brandt (2022) with 457 persons, the PsyCap correlated with Entrepreneurial tendencies as well as Growth orientation. The Entrepreneurial tendencies correlated all dimensions but Hope and Growth correlated with all dimensions. Both were correlated with whole construct of PsyCap. Concerning psychological capital dimensions, the relation between self-efficacy and entrepreneurial behaviour has been widely established (Akmaliah & Pihie, 2009; Chandler & Jansen, 1997; Chen et al, 1998; Saeid et al., 2011). Also, optimism (Lingfei & Li, 2011; Robledo et al, 2015) and hope (Laguna, 2006) are predictors of entrepreneurial intention and hope indicates entrepreneurs’ satisfaction with business ownership according to Jensen and Luthans (2002). According to these studies it seems like persistence is the only dimension which has not been studied as a relationship with entrepreneurship.

## Methodology

### Sample

Totally, 180 students responded to the questionnaire. Most of them were between 21-30 years old (67,4%), and some of the under 20 years (19,9%). Only few of them were between 31-40 years (8,3%) and even less over 41 years (2,2%). There were 50,8% women and 46,4% men as respondents, and most of them were students at university, only some of them were students from upper secondary school (3,9%). Field of education was technology of most of the students (37,6%) or business (27,1%). Some respondents were health and social work field (6,1%), natural sciences (6,1%), and humanistic & art field (5,5%). Most of the respondents were European (61,3%) and secondly most from USA (24,3%). Some respondents did not want to inform the country of origin.

### European Innovation Academy (EIA)

The European Innovation Academy (EIA) (<https://www.inacademy.eu/portugal/>) is the 3 weeks study camp fostering innovativeness and entrepreneurship with students. Students will form the enterprise with international teams during camp. They will get help from mentors with the business background. The best ones will get rewarded after the final pitch day.

### Measuring Innovativeness

Innovativeness questionnaire has been used in international studies, and its reliability has been regarded very good (see e.g. Brandt et al., 2025). The respondents were asked to rate their innovative and proactive behavior at the Likert scale 1-7. Factor analyses (Varimax) divided as planned two dimensions. Creativity was measured with 6 items, such as "I consider innovative opportunities". Cronbach's alpha was 0.841. Proactiveness was measured also with 6 items, such as "I make important organizational members enthusiastic for innovative ideas". Cronbach's alpha was 0.878.

### Measuring impact on psychological capital

Students were asked to rate honestly the impact of the EIA on their psychological capital ranging from -3 to +3, indicating if the camp decrease or increase this psychological capital item. Factor analyses (Varimax) have been earlier made with different dataset (e.g. Brandt, 2022) so those factors were used here as well. Cronbach's alphas were as following: Self-Efficacy 0,894, Hope 0,912, Optimism 0,729, Resilience 0,778.

## Results

Here the results of the entrepreneurial intentions and its connection with innovativeness is presented. Also, the impact of entrepreneurial camp to psychological capital, as well as psychological capital and its impact on entrepreneurial intentions and innovations. Finally, we present cultural differences and its relationship with variables, as well as impact of other background variables.

### Entrepreneurial intentions of the participants

The interest was to see if the students will have the interest to become entrepreneur after the EIA-camp. Results were:

- 3,3% (n=6) will not definitely start own business at the future
- 8,3% (n=15) will not probably start own business at the future
- 32,6% (n=59) did not know if they will start own business at the future
- 33,1% (n=60) will probably start own business at the future
- 22,1% (n=40) will definitely start own business at the future

There were 100 respondents who said they will most likely, or definitely start own business, and 80 persons who were not sure, or said they will not start own business. These two groups were formed and were analyzed further.

- ➔ Group A) unsure or no entrepreneurial intentions (N=80, 44,4%)
- ➔ Group B) High entrepreneurial intentions (N=100, 55,5%)

### Relationship between innovativeness and entrepreneurial intentions

As can be seen from Table 1 the entrepreneurial intention correlates statistically significantly with creativity, proactiveness and total innovativeness. When looking at the means of the low and high entrepreneurial intentions group (Table 2) the means are clearly higher with the group of high entrepreneurial intentions. Independent samples *t*-test produced statistical differences between high and low entrepreneurial intentions and all variables of innovativeness.

		Entr. Intention	Creativity	Proactiv.	Total INNOV.
Entrepreneurial Intention	Pearson Correlation	1	,431**	,363**	,428**
	Sig. (2-tailed)		<,001	<,001	<,001
	N	180	180	180	180
Creativity	Pearson Correlation	,431**	1	,657**	,872**
	Sig. (2-tailed)	<,001		<,001	<,001
	N	180	180	180	180
Proactiveness	Pearson Correlation	,363**	,657**	1	,942**
	Sig. (2-tailed)	<,001	<,001		<,001
	N	180	180	180	180
Total INNOV.	Pearson Correlation	,428**	,872**	,942**	1
	Sig. (2-tailed)	<,001	<,001	<,001	
	N	180	180	180	180

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

**Table 1.** Pearson correlation analyses of Entrepreneurial Intentions and Innovativeness

	Creativity Mean (std)	Proactiveness Mean (std)	Total Innovativeness Mead (std)
Low intentions	5,44 (0,747)	4,66 (1,089)	5,05 (0,838)
High Intentions	6,03 (0,761)	5,44 (1,140)	5,74 (0,846)
F-value	0,206, p<0,001	0,081, p<0,001	0,04, p<0,001

**Table 2.** Means of low and high entrepreneurial intentions groups in Innovativeness, results of *t*-test.

### Impact of the camp to psychological capital and its impact on entrepreneurial intentions and innovativeness

Dimensions of psychological capital all were evaluated higher because of the camp as can see in the Table 3. Least increase was in resilience, and most in self-efficacy and hope. Those students with high entrepreneurial intentions had statistically significantly more raise in every dimension of psychological capital.

	Mean (std)	Range	Low intentions Entr. Mean (std)	High intentions Entr. Mean (std)	F-value sig (t-sided)
Self-Efficacy	1,44 (0,857)	-0,12 to +3,00	1,20 (0,737)	1,62 (0,901)	6,069 p<0,001***
Optimism	1,10 (0,839)	-1,00 to +3,00	0,91 (0,749)	1,26 (0,876)	2,700 p=0,004*
Hope	1,47 (0,921)	-1,00 to +3,00	1,24 (0,821)	1,66 (0,961)	3,923 p=0,002*
Resilience	0,806 (1,011)	<b>-1,2 to +3,00</b>	0,59 (0,904)	0,98 (1,06)	3,711 p=0,009*
Psychological Capital TOTAL	1,20 (0,783)	-0,23 to +3,00	0,98 (0,646)	1,38 (0,839)	6,202 p<0,001***

**Table 3.** Psychological capital and low and high entrepreneurial intentions

### Cultural differences (USA vs. Europe) related to entrepreneurial intentions and innovativeness

When comparing US and European students there were no differences in entrepreneurial intentions, but US students were experiencing more increase in dimensions of psychological capital (see Table 4). The statistically significant differences were in self-efficacy and hope. The proactivity and total innovativeness were also statistically significantly higher with US respondents.

### Gender and educational field in comparison

There were no differences when comparing most fields represented (business vs. technology). In case of gender, there were no difference, but only in case of resilience ( $F=0,025$ ,  $p<0,001$ ) when women felt having less raise in resilience (men, mean=1,132, women=1,07).

	Europe n=111	USA n=44	F-value t-sided p.
Self-Efficacy	1,30 (0,829)	1,75 (0,875)	0,186 p=0,004**
Optimism	1,00 (0,999)	1,26 (0,999)	1,207 p=0,071
Hope	1,34 (0,902)	1,78 (0,915)	0,004 p=0,007**
Resilience	0,694 (0,901)	0,932 (1,25)	9,031 p=0,189
<b>Psychological Capital TOTAL</b>	<b>1,08 (0,724)</b>	<b>1,43 (0,860)</b>	<b>1,073 p=0,006**</b>
<b>Entrepreneurial intention</b>	<b>3,63 (1,061)</b>	<b>3,64 (1,036)</b>	<b>0,007 p=0,976</b>
Creativity	5,67 (0,779)	5,89 (1,156)	0,270 p=0,064
Proactivity	4,88 (1,156)	5,37 (1,197)	0,719 p=0,010**
<b>Innovativeness Total</b>	<b>5,27 (0,885)</b>	<b>5,63 (0,927)</b>	<b>0,525 p=0,014*</b>

**Table 4.** Cultural differences between USA and Europe. Means and standard deviations.

### Discussion

After this entrepreneurial camp there were 56% of students who were most likely to start own business after some years. When comparing this to the larger sample ( $n=1\ 460$ ) of international students the average intention of them was 46% (Brandt et al., 2025). This indicates that this kind of pedagogical camps are important when creating entrepreneurial mindset and the likeliness to start own business.

The results indicate that creativity, proactivity and innovativeness are connected to entrepreneurial intentions. These results support the earlier studies of importance of innovativeness in entrepreneurship. In regards of pedagogical applications, enhancing students' innovativeness, proactivity and creativity should be more in the curriculums. Especially in Europe proactiveness should be also emphasized in the studies. Concrete idea pitching and selling could be some ways to increase self-esteem of students.

All the aspects of the psychological capital were increased after the camp, and especially with those students who planned to start their own business in the future. Most probably those students' who applied and travelled to the EIA, already had their psychological capital at very high level, but interestingly, this experience still did increase that. It would be interesting to study the psychological capital at team level, if the EIA camps of the winning top ten teams have higher psychological capital than others.

From dimensions of psychological capital, especially self-efficacy and hope were increased. Self-efficacy means trust into own abilities in problem solving, having own opinions, and giving presentations if needed. It seems like EIA's lectures, mentors and presentation coaches were doing their job in excellent way, when the self-efficacy of students increased so much. Those people giving lectures and mentors are businesspeople, most from Silicon Valley, and they told their unique story and struggles they have faced, alongside the information about the business. This kind of genuine and encouraging way to support young people to find their path clearly impacted their self-efficacy. Also, the international teams they worked with, seem to give confidence for them. Feeling accepted and being able to contribute and communicate despite high pressure might be reasons for increase of self-efficacy. Hope means target setting and finding the different paths to gain the target. It may be that the camp's targets all the time were so clear that those impacted how the students started to think more target-orientated way. Resilience was the dimension which did had lowest increase (but still did increase), especially with women. The lower increase in resilience might be because many students experienced the camp as very demanding, there were long days to build the business and gain the clients, with team members you did not know earlier. Using English all the time was not easy to all the European students. Students needed to extend their capabilities in many ways as adapting new surroundings, new people and new working methods in very fast way. Increase of the psychological capital with 3-weeks entrepreneurial camp gives new perspectives on the ways to increase psychological capital, when earlier studies indicate that most effective interventions are only couple of hours long (Lupsa et al., 2019). Here it seems that also long and intensive interventions are working well also.

When comparing US and European students, they had the same average on the intentions to start business. The study of Brandt et al. (2025) of cultural differences indicated that lower levels of entrepreneurial intention among students from US, Nordic and European countries in contrast to their counterparts from the Middle East, India, and the Caucasus region. It may be, that western countries are experiencing quite good circumstances in working life, so the pushing factors towards entrepreneurship are weaker than other cultures. There were differences between US and European students in case of psychological capital and innovativeness. The camp had more positive impact on US students' psychological capital. Especially self-efficacy and hope increased more with US students than European ones. It should be noted that the beginning state of the psychological capital was not known, because we did not measure it when students arrived at the camp - so it is not known if the US students were having lower levels of psychological capital in advance. It may also be that even the program is European (created by Estonians), it has largely been impacted by universities from US and many speakers and mentors are from US as well. Thus, it may be that the program is especially suitable for US students, and thus they experience it more positively in regards of psychological capital.

The US students were rating themselves higher in proactivity and total innovativeness. Proactivity means selling the idea to others, systematically approaching important organization's people about the idea and acquiring new customers. It means social activity to get others involved and enthusiastic about the new ideas. It seems that US culture emphasizes and supports proactive behavior, when we stereotypically expect US people to act as socially active and confident ways. Maybe also long history in business and sales have made US people more active, when the 'land of possibilities' is there, if you are active. European people tend to be more modest and e.g. sales is typically not very attractive work for Europeans.

Overall, the students with entrepreneurial intentions increased their psychological capital during the camp. It seems like camp gave them important attitudes and perspectives that are crucial in many aspects of entrepreneurship and working life. This entrepreneurial camp had impact on the wider construct of persons' attitudes, including self-esteem. Some of the studies of entrepreneurial education show that education can exert positive effects on entrepreneurial self-esteem (e.g. Jones et al., 2008) and this kind of intensive well-built camp can do it very well.

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