Factors influencing entrepreneurial intentions of students

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Abstract

The purpose of the paper is to get insights about the impacts of entrepreneurship education on engineering students. The synthesis of the literature indicates that impact studies of entrepreneurship programmes on the attitudes and intentions of students are relatively rare. The article focuses on the testing of a novel questionnaire design, notably on its potential to distinguish entrepreneurship students and those not taking the entrepreneurship course. Responses were collected from a Hungarian university (n=147). While results of a broader study confirm that opportunity recognition is shaped by macro-level factors, which have an influence on risk perception through locus of control, the measurements used imply no significant differences in the measured factors between students, who participated in an entrepreneurship course and the control group. Our findings point to the need for good student selection and complex entrepreneurship programmes that target attitudinal change.

Keywords: Entrepreneurship, Intention Models, Entrepreneurship Education

1 Introduction

Early research on the factors that influence the decision to start a new business focused mainly on traits or personality characteristics of individuals. Then models were developed for better understanding of the entrepreneurial process that incorporated behavioural and situational factors. More recently, intentions models that focus on attitudes and their antecedents have been proposed to better explain the entrepreneurship process. (Peterman-Kennedy, 2003)

Even if the potential benefits of entrepreneurship education have been praised by researchers and educators, the impact of entrepreneurship programmes on attitudes and intentions of students remained relatively untested. (Souitaris et al., 2007)

The literature focusing on entrepreneurial intentions of students highlights the self-efficacy theory and the theory of planned behaviour and both seems to be an effective predictor of a wide range of behaviours. The self-efficacy theory involves the degree to which one perceives his ability to successfully handle given situations (Pruett et al, 2009). Engle et al. (2010) demonstrated in their research in this area that an individual's

behaviour is highly influenced by confidence in their ability to perform the behaviour necessary to be successful. Behaviour is not concerned with the skills someone has, but with the belief in one's abilities. Engle et al. (2010) analysed several research projects that focused on a wide array of potential drivers, or antecedents, of entrepreneurial activity and concluded that they were based on a number of various models including content models, which examine such factors as individual traits, and process models that are derived from social cognitive theory.

The theory of planned behaviour developed by Ajzen is also a frequently used model (Autio et. al., 2001, Souitaris et al., 2007, Lanero et al., 2011). According to Ajzen's theory, behavioural performance can be predicted from a person's plan and intentions to perform the behaviour in question. Ajzen suggests the following three kinds of salient beliefs: i) behavioural beliefs, which are assumed to influence attitudes towards the behaviour; ii) normative beliefs, which constitute the underlying determinants of subjective norms; and iii) control beliefs which provide the basis for perceptions of behavioural control (Ajzen, 1991).

Autio et al. (2001) applied the theory of planned behaviour to analyse factors influencing entrepreneurial intent among university students. Their study provides a test of the robustness of the intent approach using international comparisons and found perceived self-control to have the most important influence on entrepreneurial intent in the USA and autonomy to be a significant antecedent of entrepreneurial intent in Finland and Sweden.

The authors of the paper are entrepreneurship educators who took seriously the recommendations of Kuratko (2005), in which he overviewed the trends and challenges in entrepreneurship education for the 21st century and proposed that entrepreneurship educators must have the same innovative drive that is expected from entrepreneurship students. In the research design the authors looked for methodologies that involve higher education students to measure entrepreneurial innovation, with specific attention to the theoretical and practical methodological considerations for higher level contexts. The reason behind this ambition could also be explained by the recommendation of Lüthje and Franke (2003) who argue that it is more promising to focus stimulating activities on the right students, particularly those with a propensity to high risk taking and an internal locus of control. We take these developments as our starting point and focus on risk taking, internal locus of control and perceived efficiency of institutions, as a higher level contextual construct. Our expectation is that there will be statistically significant differences between students, who take an entrepreneurship course and those, who do not take (i.e. to test if course selection is preferred by a specific group of students with more propensity to engage in entrepreneurial innovation).

The article is structured as follows. In the methodology development section we introduce a questionnaire-based research design that was used to test the entrepreneurship attitudes and intentions of students involved in the survey. Then we present the research results, which point to no significant differences between engineering students and the control group. Finally, we present our conclusions and discuss some limitations of our approach.

2 Methodological development and measurement

In order to take into account the latest available knowledge on studying entrepreneurial innovation efforts of university students, a comprehensive literature review was carried out to assist the development of an appropriate empirical research design. Farhangmehr et al. (2016) revealed that entrepreneurship competencies are a predictor of entrepreneurship motivation, but the knowledge base is not. Following this finding we

looked at the literature of entrepreneurship psychology. The literature review of the field by Omorede et al. (2015) confirms focus on the following five areas: personality, cognitions, emotions, attitudes, and self. Going deeper into the personality traits, Morris et al. (2014) identified a core set of 13 entrepreneurial competencies that are relevant for entrepreneurial success. Actually, these are the competencies educational programmes should focus. Nabi et al. (2017) provide a systematical review of empirical evidence on the impact of entrepreneurship education in higher education on a range of entrepreneurial outcomes. According to them recent reviews suggest that the impact of entrepreneurship education programs on attitudes and behavior is equivocal because studies suggest both positive and negative outcomes.

In order to design our investigation we relied on and also departed from the findings of Simon et al. (1999) who were primarily interested in how individuals cope with risk when starting a new venture. They investigated MBA students based on a case study regarding a decision to start a venture. Their conclusion was that individuals start ventures because they do not perceive the risks involved, and not because they knowingly accept high levels of risks. Our research was also influenced by an Estonian study carried out by Venesaar et al. (2011) whose attempt was to develop a new approach in the evaluation of entrepreneurship education programme in university, as well as the findings of Gubik and Farkas (2016) who analysed motivations and entrepreneurial efforts of the Hungarian students by using the database of the international research project GUESSS (Global University Entrepreneurial Spirit Students' Survey).

As Kuratko et al. (2005) highlight entrepreneurship courses are delivered to students in various formats and qualities, therefore, it is a relevant issue to assess their usefulness and impact on entrepreneurial intentions. However, it is not easy to identify relationships and provide evidence how these type of courses might increase the likelihood of launching a technology-based company during or right after university studies.

The authors have been running entrepreneurship courses for both engineering students and students in other specialisations for more than five years and believe that the teaching methods used complement students' knowledge with entrepreneurial skills. According to anecdotal evidence and more formal assessments the feedback from students is positive. Some of their students successfully established and run different kind of companies in the past years and come back to the course as guest lecturer in order to inspire other students. Still, from year to year there is the question if the right students take the course. Is there a chance to have a next Larry Page or Sergei Brin sit in their class, and if so, how do the attitudes of the student population, from which the next generation of innovative entrepreneurs may emerge look like? This is probably an enquiry many entrepreneurship educators are curious about, which could be translated into the following broad research question:

RQ: Do entrepreneurship courses attract students with high enough entrepreneurial attitudes and intentions?

Engle et al. (2010) stress that educators need to identify individual students with specific attitudinal characteristics suggesting entrepreneurial intent and recognize their own potential influence as mentors and use it to nurture, encourage, and support students. In doing this, educators also need to let students know of the skills necessary to successfully start a business and help build their confidence in being able to perform those activities. These warnings brought us to formulation of the following hypotheses:

H1: Students taking an entrepreneurship course have different perception of the efficacy of institutions.

H2: Students taking an entrepreneurship course have higher internal locus of control.

H3: Students taking an entrepreneurship course have different perception of risks related to a cased-based entrepreneurial innovation opportunity.

In order to fill the identified knowledge gap, results of a novel questionnaire survey – originally designed to generally measure and identify the factors leading to decisions about entrepreneurial innovation (Borsi and Dőry, 2018), – were analysed to understand the differences between engineering students, who take an entrepreneurship course and those, who do not. The survey is a novel approach in this field because it included an entrepreneurial innovation case, which served to examine the contextualization of entrepreneurial innovation (Garud, 2014) and now we focus on engineering students. This means a subset (n=147) of the original student sample (n=270), for which an additional variable (whether the student participates in an entrepreneurship course) was also available.

The questionnaire started with a short case of a "pet washing kit" that was not biased towards neither men, nor women (Box 1).

> Suppose that you have had a dog or a cat for a longer time and in the past 1 year you started to experiment with a new bathing kit, which can also be used by elderly or disabled people, who may have problems to wash their pets. To build the prototype had cost you HUF 255000, but you are convinced that it could be manufactured and sold at a price of HUF 165000. The idea is a good one, no special materials are needed, but one part of the kit is original and you think it could easily be an important business secret. In your experience, the average service price for washing an average sized dog or cat is in the range of HUF 1700-2100, and you are confident that if, as an alternative, you start selling the kit, you would make a decent profit. Many people in your neighbourhood have already assured you that they would buy this product for the unit price foreseen (HUF 165000). You are about to implement the idea and grow your business.
>
> Note: HUF 255000 is slightly less than one month of annual gross national income, HUF 165000 is approximately one-twentieth of the annual gross national income (World Bank Data for 2015).

Box 1 The pet washing kit story – part 1. Source: Borsi and Dőry (2018)

In order to make sure that responders are deeply involved in the case, a friend was "invited" into the story (Box 2).

> You decide to discuss your plans with a close friend of yours - whom you think would be the most appropriate person to discuss your idea and the option to start the business, for the first time, on a confidential basis. Please, think of an existing person, WHO IS NOT YOUR RELATIVE, and give the below listed general properties of that friend:
> - gender
> - age
> - educational background / profession (the domain where he/she works or studies currently)

Box 2 The pet washing kit story – part 2 Source: Borsi and Dőry (2018)

The measurement also strengthens involvement of the respondents by designing questions for two variables: 'confidence and honesty of the situation' in Box 1 and 'appropriate informedness of the friend', i.e. the degree to which the friend was chosen to be

appropriate in that situation. Components of the theoretical model in Borsi and Dőry (2018) were then tested for the two group of students (see Figure 1).

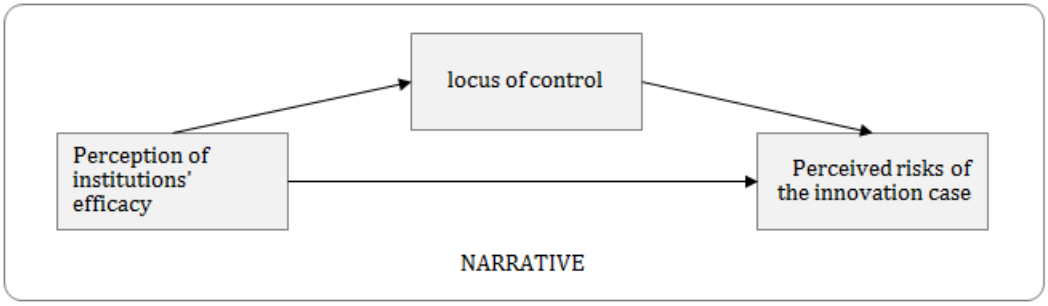

Figure 1 Theoretical model of measuring perception-centred entrepreneurial innovation with a fixed narrative (Borsi and Dőry (2018)

'Perceived risks of the innovation case' and the 'perception of institutions' efficacy' were measured with 3 items each. For 'locus of control', the standard set of 13 questions were adopted from Rotter's (1954) social learning theory. The results in Borsi and Dőry (2018) confirm that innovation success is shaped by macro-level factors, which have an influence on risk perception through locus of control and our study now seeks to get insights about the impacts of entrepreneurship education on engineering students.

3 Survey results

The underlying assumption in Borsi and Dőry (2018) was that contextual factors combined with individual's locus of control could influence risk perception Here we would like to show if there are statistically significant differences in terms of the measured variables between those taking entrepreneurship courses and those, who do not. Whether there are differences or not, it shall have implications as regards the entrepreneurial intentions of students and the education of entrepreneurship in higher education.

The questionnaires were administered in a classroom setting, and participation was voluntary. The questionnaire was filled in a total of 147 undergraduate students in one Hungarian university (Széchenyi István University, Győr, Northwest of Hungary) between November and December 2017. The vast majority of respondents are in the 20-23 year old range, 81% were male and nearly 80% are engineers.

The course entitled "From idea to business" is a one semester long, practice-oriented elective class that any students with engineering specialisation (in their first, second or third year of undergraduate education) can take. Two instructors, one academic and one entrepreneur with several years of business experience lead the class, which starts with an overview of the key features of entrepreneurship, characterisation of entrepreneurs and steps of the entrepreneurial process (with lot of example from practice). Then students propose business ideas in a structured brainstorming and form a team with the task to design and test the business model of the selected idea. Certainly, there are several pivots and revisions after the go out of the walls and learn the feedback from potential clients, customers. Finally, the course ends with a "pitch" in front of invited potential investors and/or entrepreneurs from the region.

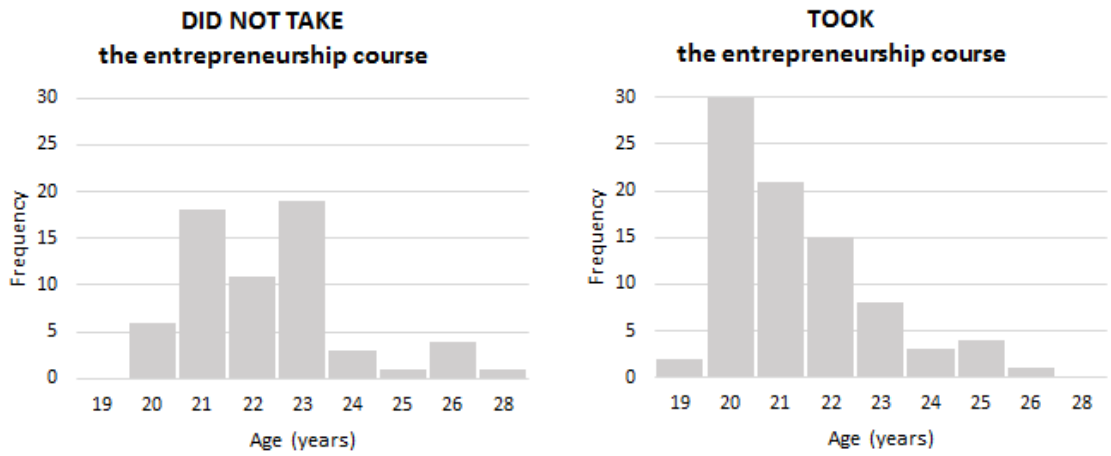

Figure 2 Frequency of respondents by age and by entrepreneurship course participation

As regards involvement in the pet washing kit narrative, statistically there were no significant differences between the two groups (Table 1), however, on a larger sample the second item of confidence ('To that friend I could not tell all details, but only some things that are important for my decisions') and the third item of informedness (My friend would easily understand all the important basics of what I want to do) would probably indicate difference.

Table 1 Variables of involvement measured on a Likert scale

	Means		t-statistic	p (difference of the two means is not zero)
	DID NOT TAKE the entrepreneurship course	TOOK the entrepreneurship course		
CONFIDENCE AND HONESTY OF THE SITUATION				
If my friend asked about confidential business details, I would not tell	0.000	-0.417	1.217	0.226
To that friend I could not tell all details, but only some things that are important for my decisions	-0.175	-0.714	1.662	0.098
One should better be careful about telling all details in such situations	0.381	0.310	0.230	0.818
APPROPRIATE INFORMEDNESS OF THE FRIEND				
My friend is generally doing well in real life problems	1.825	1.679	0.767	0.444
My friend would be able to understand all the significant details of my problem	1.667	1.940	-1.488	0.139
My friend would easily understand all the important basics of what I want to do	1.571	1.976	-1.957	0.052

Notes: -3 = I completely disagree, 3 = I completely agree. n = 63 and 84 respectively for non-course takers and course takers.

Table 2 summarises the differences between the group means. As the t-test demonstrates, there are no statistically significant differences between those, who took the entrepreneurship course and those, who did not. The application and participation in the course does not imply that group of students, who have different attributes of perceived institutional efficacy, locus of control and perceived risks of innovation.

Table 2 Variables in the theoretical model on a Likert scale

	Means		t-statistic	p (difference of the two means is not zero)
	DID NOT TAKE the entrepreneurship course	TOOK the entrepreneurship course		
PERCEIVED INSTITUTIONAL EFFICACY (Likert scale)				
In case of dispute over e.g. IP, I would trust the authorities to find justice	0.429	0.405	0.087	0.931
My firm could negotiate with any party because law and the contracts would protect my knowledge and my idea without any problem	0.524	0.179	1.120	0.232
The legal system in Hungary guarantees the protection of business ideas	0.048	0.048	0.357	0.721
Locus of control (scale: 1-13)	6.806	6.530	0.826	0.410
PERCEIVED RISKS OF THE CASE (Likert scale)				
I would know the main business development directions and would not get lost with making the pet washing kit a real product on the market, I would not perceive substantial risk of realisation	0.778	0.488	1.189	0.236
Even if the steps taken that far are logical, I am not confident enough what the next steps would be	0.270	-0.095	1.361	0.176
Making the pet washing kit business a reality is risky, most probably I would not be able to realise substantial market success	-0.317	-0.345	0.101	0.920

Notes: -3 = I completely disagree, 3 = I completely agree. n = 63 and 84 respectively for non-course takers and course takers. Risk perception measures were adopted and developed from Simon et al. (1999).

Despite the lack of statistically significant differences between the measured variables of the theoretical model in Figure 1, there is one notable difference in a specific aspect that the questionnaire also contained: future entrepreneurship ambitions and visions. The students were confronted with the question in Box 3, and Figure 3 shows the differences recorded between the two groups of students.

Let's assume that you actually found the pet washing company business within 1-2 years from now, and dedicate your energies to entrepreneurship. In a such scenario, i.e. if you really run the business, how would you imagine your future and the future of the enterprise? Please tick only one answer below, the one that you think is most possible to imagine!

- I cannot imagine to live my life as an entrepreneur / company owner in the next 5-10 years
- With my ownership (company leadership) the pet washing kit business could most be a small-medium sized family firm
- I would make the company grow and sell at a good price to retire at the age of 35, and/or looking for other challenges
- I could imagine that with my leadership the firm expands abroad, deploys capacities in cheap manufacturing locations (e.g. Mexico, China, Poland etc.) to produce the pet washing kit and sells in many countries not only this kit, but newer and newer products

Box 3 The pet washing kit story – part 3

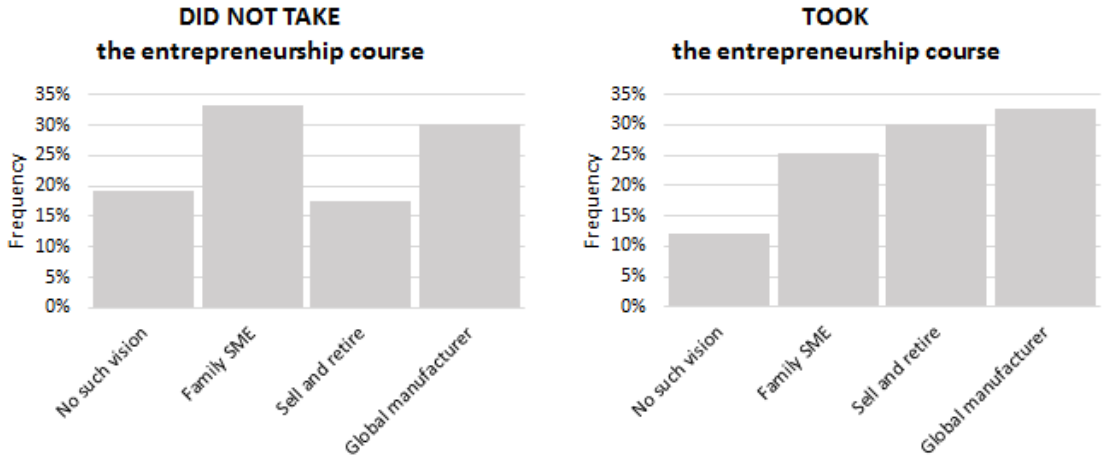

Figure 3 Distribution of respondents by future enterprise vision and entrepreneurship course participation

The most notable difference is that students, who took the entrepreneurship course can imagine in higher numbers the 'sell and retire' scenario. To a smaller extent, in the 'entrepreneur' group there are fewer students, who had no entrepreneurial vision at all in reflection to the pet washing kit case.

4 Conclusions and discussion

Our survey results have important implications for teaching entrepreneurship in higher education. Application for a 'business as usual' kind of entrepreneurship course (by which we mean a one semester class in the setting described before) does not make the selection by entrepreneurial attitudes, moreover, since the survey was administered towards the end of the course, the course has no relationship with the measured perceptions and attitudes.

Although with the above survey results do not infer causal relationships and thus we have to be careful here, still, we would state that there is not enough to provide only one or two required or elective entrepreneurship course to university students. Based on classroom experience these courses could make entrepreneurship more attractive and may even wake some entrepreneurial intentions in students with low or medium low entrepreneurial ambitions, but far more is required in order to increase significantly the willingness of higher education students to become entrepreneur. The selection to the course must be more rigorous, and/or changes are required in the teaching methods and/or curricula, paying more attention to techniques that can bring about attitudinal change. In better selected student groups the soil could be more fertile as the imagined future ventures (the last part of the pet washing kit narrative) demonstrate.

Our study has certain limitations. First of all the sample used was biased towards engineers and men and we do not have sufficient information what this bias may have caused. Another limitation is that the measurements used for this analysis are part of a broader study, in which the focus is on developing methodologies to measure innovation in multiple multilevel contexts (Borsi and Dőry (2018)). In order to make more robust conclusions and to analyse causal relationships, more specific measurements for studying how the here presented and other factors influence entrepreneurial intentions might be needed.

We can put our results in a larger context as reflected in OECD (2017) focusing on the challenges in Hungarian higher education institutions. The above suggested changes in

curricula may not be implemented without the introduction of viable resource allocation mechanisms to support entrepreneurship, innovation and the university third mission. Based on the results we share the view that the provision of basic support for new venture creation (possibly well-embedded in the wider start-up ecosystem) will bring about results if entrepreneurial attitudes are sufficiently nurtured for the next generation of innovative businessmen and businesswomen.

Certainly, in our education programmes we plan to continue with the existing experimental and some potentially new innovative entrepreneurship teaching methods, because we strongly believe that entrepreneurship education will continue as a major and growing academic discipline. This is in line with Katz (2003), who also added that there are too many academics, too much established infrastructure and too much demand from students, firms and governments to let entrepreneurship fall into disuse or disarray.

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References

Ajzen, I. (1991), "Theory of planned behavior", *Organizational Behavior and Human Decision Processes*, Vol. 50 No. 1, pp. 179-211.

Autio, E., Keeley, R., Klofsten, M., Parker, G.C., and Hay, M. (2001), Entrepreneurial intent among students in Scandinavia and USA", *Enterprise and Innovation Management Studies*, Vol. 2, No. 2, pp. 145-160.

Borsi, B. and Dőry, T. (2018): Perception of multilevel factors for innovation success: a survey of university students. Conference paper, The ISPIM Innovation Conference – Innovation, The Name of The Game, Stockholm, Sweden on 17-20 June 2018

Engle, R., Dimitriadi, N., Gavidia, J., Schlaegel, C., Delanoe, S., Alvarado, I., He, X., Baume, S. and Wolff, B. (2010), "Entrepreneurial intent: A twelve-country evaluation of Ajzen's model of planned behavior", *International Journal of Entrepreneurial Behavior & Research*, Vol. 16 No. 1, pp. 35-57.

Farhangmehr, M., Gonçalves, P., Sarmento, M. (2016) Predicting entrepreneurial motivation among university students: The role of entrepreneurship education, *Education + Training*, Vol. 58 Issue: 7/8, pp. 861-881. https://doi.org/10.1108/ET-01-2016-0019 (Date of access: 20 April 2018)

Garud, R., Gehman, J., Giuliani, A. P. (2014) Contextualizing entrepreneurial innovation: A narrative perspective. *Research Policy*, 43, pp. 1177-1188.

Gubik, A.S. and Farkas, S. (2016). Student Entrepreneurship in Hungary: Selected Results Based on GUESSS Survey. *Entrepreneurial Business and Economics Review*, 4(4), pp. 123-139.

Katz, J. A. (2003). The chronology and intellectual trajectory of American entrepreneurship education: 1876–1999. *Journal of Business venturing*, 18(2), pp. 283-300.

Kuratko, D. F. (2005). The emergence of entrepreneurship education: Development, trends, and challenges. *Entrepreneurship theory and practice*, 29(5), pp. 577-598.

Lanero, A., Vázquez, J. L., Gutiérrez, P., and García, M. P. (2011), "The impact of entrepreneurship education in European universities: an intention-based approach analyzed in the Spanish area", *International Review on Public and Nonprofit Marketing*, Vol. 8 No. 2, pp. 111-130.

Lüthje, C. and Franke, N. (2003), The 'making' of an entrepreneur: testing a model of entrepreneurial intent among engineering students at MIT. *R&D Management* 33 (2), pp. 135-147.

Morris, M. H., Webb, J. W., Fu, J., and Singhal S. (2013) A Competency-Based Perspective on Entrepreneurship Education: Conceptual and Empirical Insights. *Journal of Small Business Management*, 51(3), pp. 352–369.

Nabi, G., Liñán, F., Fayolle, A., Krueger, N., and Walmsley, A. (2017). The impact of entrepreneurship education in higher education: A systematic review and research agenda. *Academy of Management Learning & Education*, 16(2), pp. 277-299.

OECD (2017) Supporting Entrepreneurship and Innovation in Higher Education in Hungary. http://www.oecd.org/industry/supporting-entrepreneurship-and-innovation-in-higher-education-in-hungary-9789264273344-en.htm (Date of access: 20 April, 2018)

Omorede A., Thorgren, S., and Wincent, J. (2015) Entrepreneurship psychology: a review. International *Journal of Entreprenurial Management*, 11, pp. 743–768.

Peterman, N. E., and Kennedy, J. (2003), "Enterprise education: Influencing students' perceptions of entrepreneurship", *Entrepreneurship theory and practice*, Vol. 28 No. 2, pp. 129-144.
Pruett, M., Shinnar, R., Toney, B., Llopis, F., and Fox, J. (2009), "Explaining entrepreneurial intentions of university students: a cross-cultural study", *International Journal of Entrepreneurial Behavior & Research*, Vol. 15 No. 6, pp. 571-594.
Rotter, J. B. (1954), Social learning and clinical psychology. New York: Prentice-Hall.
Sánchez, J. C. (2013), "The impact of an entrepreneurship education program on entrepreneurial competencies and intention", *Journal of Small Business Management*, Vol. 51 No. 3, pp. 447-465.
Simon, M., Houghton, S. M., and Aquino, K. (1999) Cognitive biases, risk perception, and venture formation: How individuals decide to start companies? *Journal of Business Venturing*, 15, pp. 113–134.
Souitaris, V., Zerbinati, S., and Al-Laham, A. (2007), "Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources", *Journal of Business venturing*, Vol. 22 No. 4, pp. 566-591.
Venesaar, U., Ling, H., and Voolaid, K. (2011) Evaluation of the Entrepreneurship Education Programme in University: A New Approach. *Amfiteatru Economic*, Vol. XIII, No. 30, June 2011, pp. 377-391.