

STUDENTS' ATTITUDE ON ENTREPRENEURSHIP IN HIGHER AGRICULTURAL ENGINEERING EDUCATION

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Abstract

In the last decade, the Romanian agronomic engineering universities focused on the promotion of entrepreneurship among the students, by including entrepreneurial competences in curricula or by promoting entrepreneurial support activities. To develop more educational instruments in this field, we considered that the main challenge is to assess the entrepreneurship interest and needs of the students. In this context, the present paper aims to reveal the attitude of agricultural engineering students toward the implication in the development of their own business and to emphasize the role of formal education in their necessary skills development. The research is based on a survey conducted among students in final years of studies from a Romanian agronomic higher education institution and consisted in 215 questionnaires. Our approach has taken into consideration the differences among the students linked to their age, gender, place of residence, the potential employment and family environment. The main findings of our study have indicated that the students from agronomic engineering field have basically a positive attitude toward entrepreneurship and meanwhile they are very aware of the challenges related to the development of new businesses.

Key words: entrepreneurship, entrepreneurial approaches, students' attitude, agronomic engineering

INTRODUCTION

In the last two decades, the entrepreneurial education became very important due to its acknowledge role in speeding up countries economic growth [15]. Thus, the entrepreneurial interest of the students became also very important for the higher education stake holders in their process to adapt curriculum to the market needs. There are several studies which are trying to identify the factors which influence the decision behavior of students related to entrepreneurship and their conclusions are very relevant: entrepreneurship education contributes to the increase of student awareness about the subject and influence the entrepreneurial projects of the students [14], [8], [3], [16]; an entrepreneurial family background influences positively the entrepreneurial plans [2]; male students pointed out a clearer intention to start

a business [13]; the change in the employment status can stimulate individual entrepreneurial activity [6]; the students from technical fields (like agricultural engineering) have a lower interest toward entrepreneurship than the students from faculties of economic studies [7] etc. We have found also some papers which are focusing on agricultural education (agronomic, agricultural engineering, etc.) and pointed out the factors influencing the entrepreneurial projects among their students, like: entrepreneurial education, family support, perceived behavioral control, etc. [12]; education support, personality traits and skills [9]; the need to gain independence [1] etc. However, almost all the studies mentioned that the entrepreneurial courses didn't have impacts on students' intention towards entrepreneurship. "Entrepreneurship education does not teach students to pursue an

entrepreneurial career, but to apply what they learned to their future jobs” [4].

This topic was approached intensely also in Romania in the last years due to the fact that entrepreneurship became a theme of interest for Romanian higher education, many universities including in their curriculum different disciplines adapted to develop entrepreneurship competencies. A research performed in Romania on engineering students (from Petru Maior University of Tirgu Mures) revealed that there are some important factors which influence positively the entrepreneurial intentions: students’ entrepreneurial family background and entrepreneurial personality traits [5]. Also, there are studies which make a sketch of an engineer student with entrepreneurship skill: “persons which are determined to be independent ... with ability to work in the multidisciplinary teams and which have the capacity to communicate the own ideas ... these persons have the capability to take the risk to feel the business opportunity, to take the initiative ... and to make decisions based on limited information”, “persons who are passionate about what they are doing and who have a deeply knowledge in different areas of the life sciences and which are able to coordinate multidisciplinary teams”, etc. [10][11].

By following this direction of research, our research aimed to respond to the following questions: what is the level of interest towards entrepreneurship in agronomic studying field? What are the factors which differentiate the students regarding this interest? What are the premises to motivate them? What are in their opinion the success factors and challenges in the process of development of a business?

MATERIALS AND METHODS

This research aimed to analyse the entrepreneurial interests of Romanian students from agronomic field of studies. Our research is based on the results obtained from 215 questionnaires completed by students from University of Agronomic Sciences and Veterinary Medicine of Bucharest (3rd and 4th year of studies) during academic year 2018-

2019. The results were processed by SPSS, with descriptive statistic methods. Frequencies table (Table 1) indicates that in our database of respondents we have 53.5% women (from which 60% reside in urban areas and only 29.6% are employed) and 46.5% men (from which 64% reside in urban areas and 37.0% are employed). If we look more in detail by residence area, we observe that the majority of the questioned students come from cities (61.9%) but the percent of employability is higher for students which reside in rural areas (37.8%).

Table 1. Main characteristics of respondents

Variable	Categories	Frequency	Percent (%)
Gender	Woman	115	53.5
	- urban areas	69	60.0
	- rural areas	46	40.0
	- employed*	34	29.6
	- unemployed*	81	70.4
	Man	100	46.5
	- urban areas	64	64.0
	- rural areas	36	36.0
	- employed*	37	37.0
	- unemployed*	63	63.0
Residence area	Urban	133	61.9
	- gender (man)	64	48.1
	- gender (woman)	69	51.9
	- employed*	40	30.1
	- unemployed*	93	69.9
	Rural	82	38.1
	- gender (man)	36	43.9
	- gender (woman)	46	56.1
	- employed*	31	37.8
	- unemployed*	51	62.2
Total		215	100

Source: own data SPSS.

*55 students didn’t declare the employability status (25.6%)

Our questionnaire aimed to collect information on the students’ interest and view regarding entrepreneurial activities. In order to obtain all this information, we inquired eleven questions out of which, five dichotomous questions (with Yes/No answers) and four multiple-choice questions. For the last questions we converted responses also by using multiple dichotomies (dummy yes/no variables). Starting from these questions we computed the following multiple response set of variables (Table 2):

-*Entrepreneurship interest* (the own interest to start a business);

-*Business start premises* (what are the reasons that would determine the respondent to start a business);

Table 2. Annual variation coefficient

Variable	Primary variables (Dichotomy group tabulated at value 1 (yes))
Entrepreneurship interest	Q.1/Is in this period the entrepreneurship a concern for you? Q.9/If someone you know would give you \$ 50,000 gift to spend, would you invest them in a business? (other alternatives: home, cars, vacations, personal goods etc.) Q.10/ If you would have the opportunity, would you be willing to invest time and money to participate in an entrepreneurship course?
Business field	Q.11.1/If you would have the opportunity to set up a business, in which domain will you invest? - Agriculture and related activities Q.11.2/If you would have the opportunity to set up a business in which domain will you invest? - Tourism and restaurants (other food processing and delivery activities) Q.11.3/ If you would have the opportunity to set up a business in which domain will you invest? - Others (IT, services, etc.)
Business start premises	Q.2.1/Which are the reasons that would cause you to start your own business? Financial independence Q.2.2/Which are the reasons that would cause you to start your own business? Independence in time organization Q.2.3/Which are the reasons that would cause you to start your own business? I consider it the kind of activity I find myself in
Business success	Q.8.1/ Which of the following aspects do you consider the most important for the success of a business? - Motivation Q.8.2/ Which of the following aspects do you consider the most important for the success of a business? - Education Q.8.3/ Which of the following aspects do you consider the most important for the success of a business? - Money Q.8.4/Which of the following aspects do you consider the most important for the success of a business? - Friends
Business challenges	Q.6.1/Which is the biggest problem that you consider in the current entrepreneurial environment in Romania? - The accessibility of financial funds Q.6.2/ Which is the biggest problem that you consider in the current entrepreneurial environment in Romania? - Barriers to entry into new markets Q.6.3/ Which is the biggest problem that you consider in the current entrepreneurial environment in Romania? - Bureaucratic aspects Q.6.4/ Which is the biggest problem that you consider in the current entrepreneurial environment in Romania? - Identifying a sustainable business

Source: own data SPSS.

-*Business field* (if the respondent has the opportunity to open a business, in which domain would invest);

-*Business success* (which are the most important elements to assure the success in business);

-*Business challenges* (which are the elements that can impede the success of a business).

In addition, we tested: the willing to collaborate within an entrepreneurial organizations (Q.4), the main sources needed to finance their potential business (Q.5), if they have a firm business model in their family (Q.3), if they want to learn more about entrepreneurship (Q.10) and which is the time frame to develop a sustainable business in their opinion (Q.7).

Further, we computed the frequency tables and the interest variables were approached by gender, residence place, status of employment and familial environment. Also, for the questions which present the entrepreneurship interest we computed a new variable "Interest" for counting the persons who responded by 'yes' to all three questions (the answers related with interest were: Inexistent = 0; Low = 1; Medium = 2; High = 3). Additionally, we applied a crossed analysis (crosstabs) and the Pearson chi (chi-square) test to investigate if there are statistically significant differences in entrepreneurial attitude between the observed and the expected frequencies of variable sets based on the mentioned categories of classification.

RESULTS AND DISCUSSIONS

The assessment of the interest towards entrepreneurship of students took into consideration two aspects: 1) what is the level of intention and availability to start a business?; 2) why to start a business, how (what I need?) and what problems could I encounter? The first question was approached from three point of views: the degree of preoccupation in the present towards entrepreneurship (Q.1); the availability to start a business in the immediate future (prioritization) (Q.9); the field of business considered with potential by students (Q.11). The second question was approached through the assessment of three elements: premises to start a business (Q.2), factors needed for success in a business (Q.8) and factors which can impede the development of a new business (Q.6).

Overall attitude of students toward entrepreneurship

Entrepreneurship is a major concern only for 40.9% of students from agronomic field of studies (Table 3). However, if they could receive a certain amount of money in the immediate future, almost 48% of them will chose to invest in a business and 14% are undecided, so the interest is higher if exists

some kind of external funding. However, overall, if we measure interest toward entrepreneurship through the chose methodology mentioned above, only 26.8% declare that they think to open a business, 31,4% declare that ‘maybe’ will open a business if they receive money from external sources and around 42% declare that they want to learn about entrepreneurship.

Table 3. Multiple response variables frequencies

Variable	Categories	Total		Yes (%)
		Responses	Percent of cases (%)	
Entrepreneurship interest	Q.1	88	26.8	40.9 (2.8% N/R*)
	Q.9	103	31.4	47.9 (14% N/R)
	Q.10	137	41.8	63.7 (0.5% N/R)
	Total	328	100.0	-
Business field	Q.11.1	43	25.6	20.0 (20.9% N/R)
	Q.11.2	64	38.1	29.8 (20.9% N/R)
	Q.11.3	61	36.3	28.4 (20.9% N/R)
	Total	168	100.0	-
Business start premises	Q.2.1	166	57.0	77.2 (0% N/R)
	Q.2.2	90	30.9	41.9 (0% N/R)
	Q.2.3	35	12.0	16.3 (0% N/R)
	Total	291	100.0	-
Business success	Q.8.1	136	32.6	63.3 (1.9% N/R)
	Q.8.2	89	21.3	41.4 (1.9% N/R)
	Q.8.3	167	40.0	77.7 (1.9% N/R)
	Q.8.4	25	6.0	11.6 (1.9% N/R)
	Total	417	100.0	-
Business challenges	Q.6.1	76	29.8	35.3 (0% N/R)
	Q.6.2	83	32.5	38.6 (0% N/R)
	Q.6.3	65	25.5	30.2 (0% N/R)
	Q.6.4	31	12.2	14.4 (0% N/R)
	Total	255	100.0	-

Source: own data SPSS.

Related with the field of business, we observed that only 25.6% of the students want to start a business in agriculture. Actually, from their responses we saw that 38.1% want to open a restaurant or a hotel/rural touristic accommodation household and around 36.3% want to open a business in another field (like auto services, IT services, etc.). The main reasons to start a business are financial (57.0%) and time (30.9%) independence, only 11,6% from respondents identifying their self as potential entrepreneur. In the students’ opinion, related to the success and impediments in developing a business are:
 -the most important factors to start a business and to be successful are money (40,0%) and motivation (32.6%), not knowledge or connections. We have to take in consideration that 46,5% affirm that they will start a business only if they will have their own money (family, friends, etc.) and only 25.6%

would resort to loans next to their own sources (Q.5).
 -Also, over 80% of them are aware that to develop a sustainable business you need at least 1-2 years (40,9% of them indicated over 2 years) (Q.7). So, having this in their mind, is not a surprise that the main factors of success are money and motivation. However, we want to point out that even if only 41.4% from the students selected education as important factor for success (21.3% of total responses related with success), our assessment showed that almost 64% from them are willing to invest time and money to participate in an entrepreneurship course.
 the biggest challenge to develop a business in Romania is the competitiveness of the market (the barriers to enter the market - 32.5%), followed very closely by the lack of means of financing (29.8%).

Factors influencing the interest towards entrepreneurship

In this part we investigated the variables from Entrepreneurial interest set (Q.1, Q.9 and Q.10) by gender, residence place, status of employment and family environment (Table 4). In this way we tried to see if there are significant statistical differences in responses by these criteria by applying descriptive analysis and Pearson Chi-Square test.

The interest to open and develop a business is higher for men than for women, almost half of

men declared that entrepreneurship is a current concern. Also, almost 60% of the male students (compared with only 41% of the female students) are willing to start a business in the near future if they will have funds. Regarding the desire to improve their knowledge in the field, almost 64% from the students (both genders) are willing to participate in a specialized course. The Chi-square test didn't reveal significant differences by gender for the selected questions.

Table 4. Entrepreneurship interest assessment

		Q.1/Is entrepreneurship a concern for you right now?				Q.9/If someone you know would give you a \$ 50,000 gift to spend, would you invest them in a business? (other alternatives: home, cars, vacations, personal goods etc.)				Q.10/If you had the opportunity, would you be willing to invest time and money to participate in an entrepreneurship course?			
		No	Yes	N/R	Total	No	Yes	N/R	Total	No	Yes	N/R	Total
Total	No	121	88	6	215	82	103	30	215	77	137	1	215
	%	56.3	40.9	2.8	100.0	38.1	47.9	14.0	100.0	35.8	63.7	0.5	100.0
GENDER (W – Woman, M – Man)													
W	No	72	40	3	115	49	47	19	115	41	73	1	115
	%	62.6	34.8	2.6	100.0	42.6	40.9	16.5	100.0	35.7	63.5	0.9	100.0
M	No	49	48	3	100	33	56	11	100	36	64	0	100
	%	49.0	48.0	3.0	100.0	33.0	56.0	11.0	100.0	36.0	64.0	0.0	100.0
W	%	59.5	45.5	50.0	53.5	59.8	45.6	63.3	53.5	53.2	53.3	100.0	53.5
	M	%	40.5	54.5	50.0	46.5	40.2	54.4	36.7	46.5	46.8	46.7	0.0
Pearson Chi-Square Test	Chi-square 4.072 df 2 / Sig. 0.131				Chi-square 5.02 df 2 / Sig. 0.081				Chi-square 0.874 df 2 / Sig. 0.646				
PLACE OF RESIDENCE (U – Urban, R – Rural)													
U	No	79	51	3	133	55	61	17	133	47	85	1	133
	%	59.4	38.3	2.3	100.0	41.4	45.9	12.8	100.0	35.3	63.9	.8	100.0
R	No	42	37	3	82	27	42	13	82	30	52	0	82
	%	51.2	45.1	3.7	100.0	32.9	51.2	15.9	100.0	36.6	63.4	0.0	100.0
U	%	65.3	58.0	50.0	61.9	67.1	59.2	56.7	61.9	61.0	62.0	100.0	61.9
	R	%	34.7	42.0	50.0	38.1	32.9	40.8	43.3	38.1	39.0	38.0	0.0
Pearson Chi-Square Test	Chi-square 1.530 df 2 / Sig. 0.465				Chi-square 1.591 df 2 / Sig. 0.451				Chi-square 0.641 df 2 / Sig. 0.726				
Employment status													
No	No	65	24	0	89	39	46	4	89	39	49	1	89
	%	73.0	27.0	0.0	100.0	43.8	51.7	4.5	100.0	43.8	55.1	1.1	100.0
Yes	No	35	35	1	71	31	35	5	71	21	50	0	71
	%	49.3	49.3	1.4	100.0	43.7	49.3	7.0	100.0	29.6	70.4	0.0	100.0
N/R	No	21	29	5	55	12	22	21	55	17	38	0	55
	%	38.2	52.7	9.1	100.0	21.8	40.0	38.2	100.0	30.9	69.1	0.0	100.0
No	%	53.7	27.3	0.0	41.4	47.6	44.7	13.3	41.4	50.6	35.8	100.0	41.4
	Yes	%	28.9	39.8	16.7	33.0	37.8	34.0	16.7	33.0	27.3	36.5	0.0
N/R	%	17.4	33.0	83.3	25.6	14.6	21.4	70.0	25.6	22.1	27.7	0.0	25.6
	Pearson Chi-Square Test	Chi-square 26.372 df 4 / Sig. 0.000				Chi-square 37.449 df 4 / Sig. 0.000				Chi-square 5.947 df 4 / Sig. 0.203			
FAMILY ENTREPRENEURIAL ENVIRONMENT													
No	No	72	29	0	101	44	51	6	101	48	52	1	101
	%	71.3	28.7	0.0	100.0	43.6	50.5	5.9	100.0	47.5	51.5	1.0	100.0
Yes	No	49	59	5	113	38	52	23	113	29	84	0	113
	%	43.4	52.2	4.4	100.0	33.6	46.0	20.4	100.0	25.7	74.3	0.0	100.0
N/R	No	0	0	1	1	0	0	1	1	0	1	0	1
	%	0.0	0.0	100.0	100.0	0.0	0.0	100.0	100.0	0.0	100.0	0.0	100.0
No	%	59.5	33.0	0.0	47.0	53.7	49.5	20.0	47.0	62.3	38.0	100.0	47.0
	Yes	%	40.5	67.0	83.3	52.6	46.3	50.5	76.7	52.6	37.7	61.3	0.0
N/R	%	0.0	0.0	16.7	0.5	0.0	0.0	3.3	0.5	0.0	0.7	0.0	0.5
	Pearson Chi-Square Test	Chi-square 53.322 df 4 / Sig. 0.000				Chi-square 15.739 df 4 / Sig. 0.003				Chi-square 13.183 df 4 / Sig. 0.010			

Source: own data SPSS.

*Question Q.3: Do you have personally or anyone else in the family, your own business?

The situation is similar if we look at the interest by place of residence. The differences between the answers of students from urban and rural areas are not statistically significant (p value > 0.5). However, the frequencies analysis allows us to conclude that among rural students exists a slightly higher preoccupation in this domain (with around 6-7% more than for students from urban areas). If by gender and place of residence there aren't so many differences, when we take in consideration the employment status or entrepreneurial family environment the situation changes. Chi-square test results revealed a significant difference between: the students which are employed and the ones which are not in relation with questions Q.1 and Q.9; the students who have a firm business model in their family and the ones who are not related to all the questions connected with entrepreneurial interest. So, what we may observe is that when students get a job, their vision on life changes.

Half of the students that are employed are thinking to open their own business and if they receive somehow money they are disposed to invest immediately and also, over 70% of them are willing to invest time and money to learn how to do it.

The situation is similar if we group the students based on their entrepreneurial family environment. Around 52% of the students who grow up in an entrepreneurial environment are thinking to open their own business, 46% are willing to do it the near future and almost 75% want to learn how to be an entrepreneur.

The level of interest towards entrepreneurship of students

In the final part of our paper we computed a new variable (Interest) which comprises all the positive answers given by students to the questions related with the assessment of interest towards entrepreneurship. We established this interest on four levels, from inexistent to high, such in Table 5.

Table 5. Level of interest – descriptive statistics

		Interest*				
		Inexistent	Low	Medium	High	Total
Total	No	40	58	81	36	215
	%	18.6	27.0	37.7	16.7	100.0
GENDER						
Women	No	23	39	38	15	115
	%	20.0	33.9	33.0	13.0	100.0
Men	No	17	19	43	21	100
	%	17.0	19.0	43.0	21.0	100.0
Pearson Chi-Square Test		Chi-square 8.098 / df 3 / Sig. 0.044				
PLACE OF RESIDENCE						
Urban	No	29	35	45	24	133
	%	21.8	26.3	33.8	18.0	100.
Rural	No	11	23	36	12	82
	%	13.4	28.0	43.9	14.6	100.
Pearson Chi-Square Test		Chi-square 3.693 / df 3 / Sig. 0.297				
EMPLOYEE						
Unemployed	No	26	21	28	14	89
	%	29.2	23.6	31.5	15.7	100.0
Employed	No	6	22	31	12	71
	%	8.5	31.0	43.7	16.9	100.0
Pearson Chi-Square Test		Chi-square 12.398 / df 6 / Sig. 0.054				
FAMILY ENTREPRENEURIAL ENVIRONMENT						
Non-Entrepreneurial	No	27	30	30	14	101
	%	26.7	29.7	29.7	13.9	100.0
Entrepreneurial	No	13	27	51	22	113
	%	11.5	23.9	45.1	19.5	100.0
Pearson Chi-Square Test		Chi-square 8.098 / df 3 / Sig. 0.044				

Source: own data SPSS.

The assessment of interest at students' level revealed that only 16.7% are very interested to develop their own business (these are generally men, students from urban areas and

students with an entrepreneurial background) and 37.7% obtained a medium score. However, overall, we can affirm that almost

55% of them have a positive standing towards entrepreneurship.

The Pearson Chi-Square test confirmed that are significant differences in dataset by gender, the family entrepreneurial environment and, in extremis, by employment. This statistical test allowed us to assess the interest towards entrepreneurial activities and to validate our findings. Meanwhile, if for place of residence we do not have high difference (50-60% of students have a positive attitude), for the other categories we may conclude the following (Fig. 1):

- men have a higher degree of acceptance of entrepreneurship activities, around 64% compared with only 46% of women;
- the majority of students which came from rural areas (58.5 %) want to develop a business, of which, 20% want to set up a business in agriculture and around 30% in tourism and restaurants (including rural accommodation establishments). We consider

that this situation is due to the fact that almost 60% of them own a business in their family linked to these activities;

-based on their employment status, 60% of employed students will prefer an activity which can offer them financial independence and more time. Regarding the students which don't have a job, only 47% of them have in interest towards entrepreneurship. Actually, in this category we have the highest percent of the persons with no interest howsoever to develop a business (almost 30%);

-if they have a raw model in their life (they or someone from the family have a business) the interest to have and develop an entrepreneurial activity is higher. For example, 64% from the students which lived in an entrepreneurial familial environment show a medium and high interest towards entrepreneurship compared with only 44% in the category of the students which don't have this kind of environment.

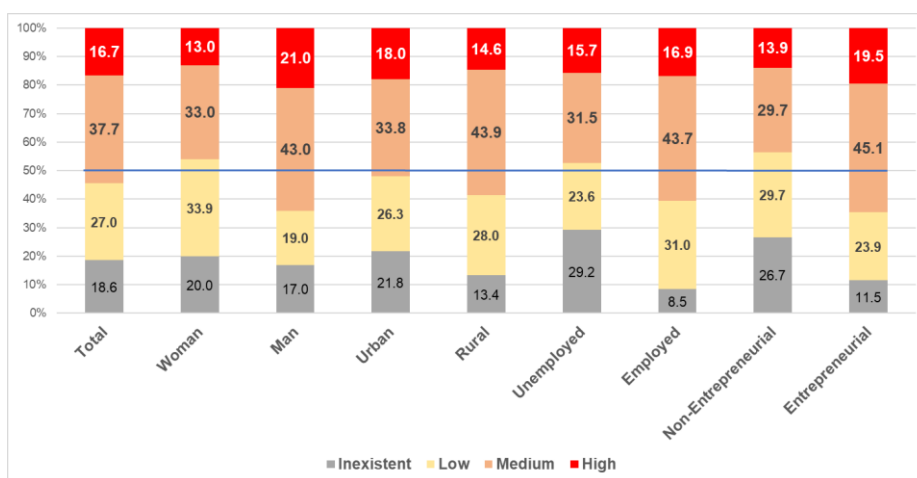


Fig.1. Level of interest by factors (%)
 Source: Own design and calculation.

CONCLUSIONS

The aim of this research was to find the extent of entrepreneurship interest of Romanian engineering students from University of Agronomic Sciences and Veterinary Medicine of Bucharest. Results showed that only 55% of the respondents have a certain interest towards developing a business. We want to point out that only 16.7% were very interested in this subject (this are in general men,

students from urban areas or students with an entrepreneurial background in their family).

All the 215 students included in the research were from the last years of studies which means that they learned about entrepreneurship along many disciplines inside curricula, but it's obvious that there are many other factors which influence their decisions. Actually, our findings complete other studies in the field from Romania which showed that "students' participation in

entrepreneurship education does not influence significantly their entrepreneurial intentions” [5]. In this way, we can say that the university curriculum only contributes to the formation of basic competencies and abilities but don’t motivate the students “to do”.

In the light of this findings, the recent national initiative to create and implement, at universities’ level, organizations to promote entrepreneurship among students (student entrepreneurship societies) may improve the situation and foster entrepreneurship among students, including the ones from agricultural engineering fields. In 2019 this societies provided classes on different subjects like business management or entrepreneurial skills development, supported start-up exhibitions and presentations of successful entrepreneurs, organized thematic workshops and workgroups, etc. By taking these elements into account we plan to continue this research more in depth to see if this kind of institutional support, next to the university curricula, has a real impact on the growth of the interest of students towards entrepreneurship.

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