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Study-related determinants of university graduates' entrepreneurship

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ABSTRACT

Objective: The study undertook an assessment – unique in Polish conditions – of the factors related to higher education differentiating the group of graduates of the Jagiellonian University (JU) in terms of their professional activity in the context of taking up employment or starting self-employment.

Research Design & Methods: Lazear's theory was applied to find study-related entrepreneurship determinants. The study attempted to determine the factors influencing the employment of Jagiellonian University graduates or their self-employment. The following explanatory variables were used during the study: scientific discipline and students' faculty, professional activity or possibly running a business by the student, mode of study (full-time versus part-time), and scientific and non-scientific activities such as volunteering, undertaking studies abroad, and internships. The analyzes were based on data collected during the alumni career paths research of more than 6000 graduates who completed their studies between 2015 and 2019.

Findings: The Mann-Whitney test and parametric t-Student tests showed that graduates of the JU who started a business, as opposed to those who work as employed persons, already set up a business during their studies and then continued it or started other types of business activity. Regarding the two analysed groups of students, there were significant differences in the completed faculty, study mode (full-time versus part-time), student internships, studies, internships abroad, and volunteering.

Implications & Recommendations: The results of the analyses can be used by several groups of beneficiaries. Firstly, they can be useful for high school graduates intending to start higher education, as they indicate such disciplines and fields of study, after which the chances of professional success are the highest. The second group interested in the results of this work might be university students, who, based on its results, may undertake additional academic and non-academic activities that could increase their chances of professional success. Thirdly, the management of universities can use the results of research when preparing an educational offer that would be best suited to the needs of the labour market.

Contribution & Value Added: The subject of factors differentiating the professional attitudes of university graduates, especially in countries undergoing systemic transformation, is insufficiently explored. Deficiencies in quantitative research based on large sets of data are particularly visible. This article fills this gap by pointing to the factors that significantly affect self-employment or hired work by graduates of the oldest and one of the most renowned universities in Poland.

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INTRODUCTION

One of the most important life decisions that young people make is to start their professional career as an employed person or as an entrepreneur. Often, these decisions are related to the decision to start university studies. It is worth paying attention to the global trend which is the systematic increase

in the percentage of people undertaking higher education. Today, tertiary education is, on average, the most common attainment level among 25-34-year-olds in OECD countries and constitutes 45%; in Poland, it is 43% (OECD, 2022). According to the EU policy, universities should support entrepreneurial activities and hence positively influence economic and social progress (European Commission, 2006). As we know, almost half of the population between 25 and 34 years old take up tertiary education, hence, entrepreneurial support at universities becomes important. The study attempted to analyse the factors related to studies that differentiate graduates of Jagiellonian University (the oldest and one of the most respected universities in Poland) in terms of the type of professional activity after graduation. The study was based on data from the Careers Service of the Centre for Academic Support JU. The research contributes to the entrepreneurship literature by empirically testing Lazear's hypothesis using a sample of JU graduates in the period 2014-2019 and narrowing the determinants to those related to students' academic activities. According to Sułkowski (2016), one of the basic conditions for the development of entrepreneurship is an appropriate educational process, carried out at all levels of education, including higher education. For this reason, this study attempted to identify significant studies-related determinants that affect the decision made by graduates of Jagiellonian University to take up employment or start their own businesses.

Many researchers focus on the issues of motivation and factors determining the decision of university graduates to start a business. A popular psychological approach is a theory of planned behaviour (TPB) developed by Ajzen (1991). It assumes that intentions are a significant determinant of human social behaviour. In his model, Ajzen indicates that the intended results from the expectations of a given person regarding the benefits of a given behaviour – attitude, the perception of the correctness of this behaviour from the point of view of social norms – subjective norms, and additionally from the assessment of the difficulty of a given behaviour: perceived behavioural control (Wasilczuk, 2021; Wach & Bilan, 2021). Concerning this theory, a person can have the feeling of having control over life and taking up self-employment can be a manifestation of this ability to control.

Such an approach, however, seems to be insufficient to fully explain entrepreneurial attitudes based on social psychology. The alternative entrepreneurial intention model is called Shapero's entrepreneurial event (SEE). Initially, it was developed by Shapero (1975), then developed by Sokol (1982), and finally, Kruger contributed to it with important findings (1993). According to the SEE model, individuals' intentions are guided by inertia until something disturbs or displaces them (Krueger & Brazeal, 1994). Such displacement is an initial factor that causes a change in human behaviour (Shapero & Sokol, 1982). Such a change can push an individual into risky behaviour connected with starting up a business. According to Ayob, Yap, Sapuan, and Rashid (2013), displacement can be negative like the lack of job satisfaction, or positive such as rewards. Noteworthy, the SEE model stresses that desirability, feasibility, and a propensity to act are the major factors that control an individual's intention to create a new venture (Ahuja, Akhtar, & Wali, 2019). Perceived desirability refers to a situation in which an individual starts a company, and perceived feasibility is the recognition by an individual that he or she can establish such a company, while the perception of attractiveness is influenced by personal attitudes, values, and feelings that result from the individual's social environment, such as family, friends, and colleagues. Factors such as knowledge and human and financial resources influence the perceived feasibility (Shapero & Sokol, 1982). It is worth mentioning that entrepreneurial activities are risky, and risk is the central part of entrepreneurial intention (Zhang, Wang, & Owen, 2015). Many researchers proved that a positive attitude towards risk or a willingness to bear uncertain results is associated with entrepreneurial intention (Douglas & Shephard, 2002). Wach indicates that the environment and experience of the family business has a positive effect on entrepreneurial intentions, making students with family entrepreneurship background more entrepreneurial than those that do not have such experience (Wach, 2015).

The intention to become an entrepreneur is not a sufficient condition to start a business. According to Piróg (2014), there are external and internal determinants that create four groups of factors interacting with each other. These are individual/personal characteristics of an individual, social capital/social conditions, potential/competence, qualification capital (education and experience), and external condi-

tions (macroeconomic context). This approach is coherent with Lazear's 'jack-of-all-trades' theory, according to which the choice between self-employment and paid employment shows that having a background in many different roles increases the probability of becoming an entrepreneur (Lazear, 2002). University education and university-related additional activities deliver a lot of various competencies to the students. In turn, it may influence the choice of an individual graduate to become self-employed or paid employed. In this research, Lazear's model was applied to identify study-related determinates which have an impact on JU graduates to search for paid employment or start their own businesses.

The rest of the paper is organized as follows. Section 2 briefly reviews the evolution of university graduates' entrepreneurship and develops our hypotheses. In Section 3, we describe our sample and research design. Next section provides the results of the distributions' comparison of hired and self-employed graduates. Finally, the last section concludes and gives some insights on policy implications of the study.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Lazear's 'jack-of-all-trades' theory was verified by many researchers. A big sample data set of 29 transitional post-communist countries was meant to verify the hypothesis of the negative impact of university education on the probability of being self-employed. To create a set of entrepreneurship determinates Lazear's model was applied and empirical analysis was conducted. It was proved that a university education does not support entrepreneurship. However, the research proved that individuals with some experience and a more balanced portfolio of human and social capital can lead to taking up a decision to set up a business, which supports the 'jack-of-all-trades' theory (Habibov *et al*., 2016). Lazear's hypothesis was also supported by Schutzer, who proved that a balanced skill set is important for making progress in venture creation. This set of skills comes from the innate entrepreneurial talent of an individual and prior managerial and entrepreneurial experience, early interest in an entrepreneurial career, and further investments in entrepreneurial education (Stuetzer *et al*., 2013a). However, Silva tested Lazear's hypothesis using two different methods for the Italian working population. When cross-sectional techniques were used the theory seemed to be valid. However, when the panel technique was used, the results showed that a spread of knowledge across different fields does not increase the probability of becoming an entrepreneur (Silva, 2007). In the German case, a large representative sample of the German population was used to evaluate the validity of the balanced skills concept and its influence on choosing own business rather than paid employment. In this study, nascent entrepreneurs were compared to people who decided to continue their paid work. The article leads to the conclusion that Lazear's theory is backed by German data (Wagner, 2006). Another German study conducted on innovative (technology-oriented or knowledge-based) new firms showed that the traditional human capital indicators individually have little or no influence on entrepreneurial skills. However, consistent with Lazaer's theory those entrepreneurs who have got a varied set of work experience have higher entrepreneurial skills relevant to starting and growing a firm (Stuetzer *et al.*, 2013b). Using a data set of Canadian entrepreneurs and individuals who were paid/employed, Åstebro and Thompson (2011) tried to find the set of characteristic skills and triggers that pushes people towards risky occupations which are connoted with setting up a business. The article tested the jacks-of-all-trade and the so-called 'test for variety' hypothesis. These two theorems are not mutually exclusive, but they imply distinctive interpretations of the cause and effects of occupational variety. In this research, it was proven that the 'test for variety' dominates the effects of Lazear's theory. However, both theorems seem to be true (Åstebro & Thompson, 2011). Similar conclusions come from the work of Chung and Parker, who proved that the 'test for variety' is a key driver of entrepreneurship decisions of college graduates (Chung & Parker, 2020).

In the Polish case, Lazear's hypothesis was tested too. The research of Kurczewska and Mackiewicz positively verified Lazear's concept proving that in Polish conditions, individuals with a broader educational and professional background are more likely to start a business. Additionally, the level of education has a negative influence on the chances of survival as an entrepreneur, but at the same time, the number of fields studied has a strong impact on success (Kurczewska & Mackiewicz, 2020). The same authors did another piece of research focusing on the determinates

which increase the probability of business survival. They found out that the breadth of education impacts the propensity to start a business, but it also increases the chances of business survival. The breadth of professional experience turned out to have a significant impact on business survival, but this result did not hold for extensive managerial experience (Kurczewska & Mackiewicz, 2020). According to the work of Gano and Łuczka (2020), Polish students have insufficient knowledge in the field of running their own business, therefore providing them with appropriate qualifications in this regard should increase entrepreneurial intentions. Hence, not directly, Lazear's concept is supported, because a proper skill set is a stimulant of nascent entrepreneurship.

RESEARCH METHODOLOGY

Higher Education Institution (HEI) Data

In Poland, two methods are used to monitor the professional careers of graduates of universities and other higher education institutions. One of the tools is the nationwide system for monitoring the economic fate of university graduates (the so-called ELA), which has been run in a centralized manner since 2014. In this study, particular importance was given to employment and wages as economic outcomes of higher education. The data contained in the ELA come from two sources: the POL-on system, developed and implemented by the Ministry of Education and Science and the Social Insurance Institution.

The second method of examining the professional career of graduates is research conducted individually and separately by universities. An example of such a study are the activities undertaken by JU since 2008. The JU intends to systematically collect data on the entire population of graduates. Accordingly, graduates are invited to participate in this study at different time intervals (0.5 years, 3 years, and 5 years after graduation). The effectiveness of this study is astonishingly high and averages between 55% and 65% of returns. In the current study, the results of the JU's studies were used, because they are much more accurate and include non-economic parameters that are missing in the ELA study.

Sample Characteristics

This study used data from surveys conducted among graduates of master's studies from 2015, 2016, 2017, 2018, and 2019. Due to the high convergence of survey questions conducted in individual years, it was possible to build a uniform database based on which it was possible to conduct research of a quantitative nature.

We used a graduates' survey to compare hired and self-employed workers. The comparative analysis was built based on data obtained in the last four editions of the survey, *i.e.* for 2015, 2016, 2017, 2018, and 2019 vintages. In the end, 7675 observations were included in the database. The following Table shows the number of records (survey responses) by year.

Table 1. Sample size in the JU graduates survey

Academic year	No. of responses	Share of the whole sample
2014/2015	1935	25.21%
2015/2016	1651	21.51%
2016/2017	1391	18.21%
2017/2018	1070	13.94%
2018/2019	1628	21.21%

Source: own study.

The table below presents the distribution of graduates by present-day (up to six months after graduation). It turns out that more than half of JU graduates were not continuing their studies but working. A quarter of JU graduates combined work and study and 15% did not work.

The proportion of graduates taking up paid jobs and those studying has been relatively stable over time. On average, every year between 2015 and 2019 around 6% of all working graduates were self-employed.

Table 2. Distribution of JU graduates by post-graduation status, 2015-2019 vintages

Post-graduation status	Number	Share
I am working and not continuing my education	4256	55.45
I am working and pursuing my studies	1927	25.11
I am not working, but continuing my education	688	8.96
I am not working and I am not continuing my education	542	7.06
No answer	262	3.41
Total	7675	100.00

Source: own study.

Table 3. Distribution of working graduates by employment and activity, 2015-2019 vintages

Year	Category	Numbers	Percentage
2015	hired	1423	93.25
	own business	103	6.75
2016	hired	1229	95.05
	own business	64	4.95
2017	hired	1058	95.23
	own business	53	4.77
2018	hired	791	93.5
	own business	55	6.5
2019	hired	1314	93.39
	own business	93	6.61
Total 2015-2019	hired	5815	94.5
	own business	368	5.95

Source: own study.

Study-related Variables

In the following analysis, we wanted to determine whether the fact that graduates start their own businesses or take up employment depended on certain characteristics related to the period of study. Furthermore, we tested the set of hypotheses if the distributions of those two groups differ due to these characteristics. Among the variables were mainly those related to the faculty completed, the scientific discipline, and the type of study divided into the full-time and part-time programs.

Self-employment and running own business were the most popular among graduates from the Faculty of Management and Social Communication (31% of them started running a business), the Faculty of Law and Administration (17.7%), and the Faculty of Philosophy (approximately 10%). On the other hand, the least popular faculties (from each faculty less than 10 graduates started a business in the analyzed period) were the Faculty of Biochemistry, Biophysics and Biotechnology (three people), Faculty of Chemistry (five people), and the Faculty of Polish Studies (nine people). The structure of those self-employed and hired by faculty translates into the structure of these groups by discipline. The social sciences discipline was dominant (61-62% of graduates in both groups can be assigned to this discipline), while the interdisciplinary sciences discipline was the least popular. The sciences and natural sciences, on the other hand, were marginally more popular among the business group than among the salaried employees.

A feature that differentiates the two groups is the mode of study. In the case of salaried employees, the vast majority have completed full-time studies (around 82%), while among those who were self-employed, only 7% declared having completed full-time studies.

Table 4. Distribution of working graduates by faculty, discipline, and programme completed, 2015-2019 vintages

Category	Hired		Self-employed	
	#	%	#	%
By faculties				
Faculty of Biochemistry, Biophysics and Biotechnology	133	2.29	3	0.82
Faculty of Biology, Faculty of Biology and Earth Sciences, Faculty of Geography and Geology	339	5.83	17	4.62
Faculty of Chemistry	198	3.4	5	1.36
Faculty of History	261	4.49	16	4.35
Faculty of International and Political Studies	442	7.6	21	5.71
Faculty of Law and Administration	1043	17.94	65	17.66
Faculty of Management and Social Communication	1582	27.21	114	30.98
Faculty of Mathematics and Computer Science	240	4.13	21	5.71
Faculty of Philology	543	9.34	29	7.88
Faculty of Philosophy	586	10.08	38	10.33
Faculty of Physics, Astronomy and Applied Computer Science	127	2.18	29	7.88
Faculty of Polish Studies	308	5.3	9	2.45
Inter-faculty interdisciplinary studies	13	0.22	1	0.27
By disciplines				
Humanities	1220	20.98	65	17.66
Interdisciplinary studies	13	0.22	1	0.27
Science and natural sciences	1018	17.51	75	20.38
Social sciences	3564	61.29	227	61.68
By programme type				
Full-time programme	4818	82.85	26	7.07
Part-time programme	951	16.35	238	64.67

Source: own study.

Variables Related to Non-study Activity

The structure of hired and self-employed graduates is different when considering activities during their studies. Looking at the activities related to the field of study, one can note that graduate entrepreneurs already started their own businesses during their studies (almost 22% of them), while in the group of graduates who are employees, this amounts only to 1%. Differences of several percentage points between the two groups can also be noticed in the case of work placements at home and abroad. In the case of non-degree-related activities, a difference in structure is also apparent, in particular the significant prevalence of self-employment among graduate entrepreneurs and the dominance of casual work among employed graduates.

Table 5. Distribution of working graduates by activity undertaken during their studies, 2015-2019

Activity	Activities matched to the studies				Activities unmatched to the studies			
	Hired		Self-employed		Hired		Self-employed	
	#	%	#	%	#	%	#	%
Full-time employment	1412	24.28	104	28.26	1398	24.04	71	19.29
Own business	57	0.98	81	22.01	124	2.13	101	27.45
Occasional work	908	15.61	67	18.21	2353	40.46	105	28.53
Volunteering	1511	25.98	77	20.92	874	15.03	52	14.13
Internship in the country	3279	56.39	157	42.66	296	5.09	17	4.62
Internship abroad	2594	44.61	122	33.15	250	4.30	17	4.62
Studying abroad	760	13.07	29	7.88	–	–	–	–

Note: % refers to the entire group of hired and self-employed.
Source: own study.

It is also worth considering the number of activities broken down by those related and unrelated to the study process and by graduate entrepreneurs and those in paid employment.

Among activities unrelated to the field of study, it can be seen that generally, the majority undertook no more than one activity. Two activities were undertaken by several per cent of respondents in both groups. Three or more activities involved only a few per cent of graduates. The distribution of the number of activities consistent with the completed field of study was similar in both groups of graduates with a slight difference for two activities, which also predominated among graduates taking up paid employment. Among graduate entrepreneurs, on the other hand, the lack of activities related to the field of study was predominant (about 27 declared cases).

Looking at total activities, the distribution was very similar among the employed and self-employed. Between two and four activities were undertaken by around 85-87% of respondents in both groups.

Table 6. Distribution of working graduates by the number of activities undertaken during their studies, 2015-2019

No. of activities	Hired graduates	Percentage	No. of activities	Self-employed graduates	Percentage
Activities unmatched to the completed field of study					
0	2299	39.54	0	154	41.85
1	2241	38.54	1	128	34.78
2	917	15.77	2	48	13.04
3	237	4.08	3	23	6.25
4	97	1.67	4	8	2.17
5	23	0.4	5	4	1.09
6	1	0.02	6	3	0.82
Activities matched to the completed field of study					
0	1431	24.61	0	100	27.17
1	1216	20.91	1	84	22.83
2	1543	26.53	2	80	21.74
3	1133	19.48	3	65	17.66
4	404	6.95	4	27	7.34
5	84	1.44	5	11	2.99
6	4	0.07	6	1	0.27
Total activities					
0	263	4.52	0	9	2.45
1	1249	21.48	1	92	25
2	1237	21.27	2	79	21.47
3	1442	24.8	3	82	22.28
4	1136	19.54	4	63	17.12
5	465	8	5	35	9.51
6	23	0.4	6	8	2.17

Source: own study.

RESULTS AND DISCUSSION

Comparison of the Distributions of Hired and Self-employed Graduates

To compare the distribution of employed and self-employed graduates, many statistical tests were carried out. The null hypothesis states that two independent samples are drawn from a population with the same distribution using the Wilcoxon rank sum test, also known as the Mann-Whitney two-sample statistic (Wilcoxon, 1945; Mann & Whitney, 1947). To compare the structure of the two groups, many parametric tests were also carried out (the table below shows the results of the Student's t-test, but the tests were carried out with modifications such as rejecting the assumption of the equality of variance in the two groups or the Welch test).

Using 5% as a cut-off significance level, it should be concluded that the distributions of graduates who were hired and self-employed differ due to several characteristics. Firstly, differences were evident in the faculty completed and the full-time or part-time programme (Dolton & Silles, 2001; Jasiński *et al*., 2017).

Looking at activities during the studies in line with the field of study, we found that the distributions of entrepreneurial graduates and employed graduates differ in terms of work internships, studies

abroad, and volunteering. Moreover, own a business, irrespective of its matching with the field of study, is an element of differentiation between the two groups; self-employed graduates already start their own business during their studies and then continue it or enter into new types of these activities. Further differentiating factors were occasional work or full employment during studies unmatched in the field of study. In this case, graduates in paid employment were more likely to be interested in these activities (Pinto & Pereira, 2019; Odlin *et al*., 2022). Interestingly, the distribution of graduates by the number of activities undertaken during the studies was statically the same.

Table 7. Results of the non-parametric Mann-Whitney test and the parametric Student's t-test (assuming different variances) for equality of the distributions of hired and self-employed

Variables	Mann-Whitney test		Student's t-test	
	Test statistics	p-value	Test statistics	p-value
Faculty	-2.695	0.007	-2.7729	0.0058
Discipline	-0.591	0.5544	-1.1521	0.2499
Programme (full or part-time)	-3.159	0.0016	-1.9146	0.0563
Study abroad	2.893	0.0038	3.5199	0.0005
Number of activities unmatched to the studies	0.016	0.9876	-1.2147	0.2252
Number of activities matched to the studies	0.804	0.4212	0.3505	0.7261
Total number of activities	-0.202	0.8402	-0.6429	0.5207
Employment during studies matched to the field of study	-1.72	0.0853	-1.6464	0.1005
Activities during studies matched to the field of study	-26.484	0	-9.7068	0
Occasional work matched to the field of study	-1.323	0.1859	-1.2521	0.2112
Volunteering matched to the field of study	2.155	0.0312	2.3005	0.0219
Internships matched to the field of study	5.139	0	5.1554	0
Foreign inter matched to the field of study	4.294	0	4.5063	0
Employment during studies unmatched to the field of study	2.075	0.038	2.2241	0.0267
Activities during studies unmatched to the field of study	-25.146	0	-10.8313	0
Occasional work unmatched to the field of study	4.535	0	4.8831	0
Volunteering unmatched to the field of study	0.469	0.6391	0.4791	0.6321
Internships unmatched to the field of study	0.399	0.6896	0.4155	0.678
Foreign intern abroad matched to the field of study	-0.293	0.7694	-0.2841	0.7765

Source: own study.

CONCLUSIONS

This article provided empirical evidence that two analysed groups of working university graduates, *i.e.* those hired and entrepreneurs differed in terms of some characteristics. These were degree-related variables (faculty and full-time vs. part-time studies) and variables defining activities during studies (such as internships, volunteering, internships abroad and studying abroad, employment, occasional work, and own business taken during studies).

The results of the Mann-Whitney statistics met partially the assumptions of Lazear's theory, which refers to entrepreneurs' pre-experience in a variety of areas. Undertaking many different activities during studies is an example of such preparation. In this way, individuals acquire sufficient skills and knowledge to run their businesses. The null hypothesis can be rejected as stated that there is no difference between medians of the above-mentioned variables. The distributions in the two groups of working graduates differed significantly.

The main limitation of the analysis presented in this article is that connected with the variables' availability, the collected data relates only to some aspects of the Jagiellonian University graduates' entrepreneurship or activities. As regards other research limitations, one should bear in mind that analysed data were collected from one specific Polish University.

Firstly, it implies that the results should be interpreted only in the context of Poland and secondly, in the context of a region with a specific labour market such as Malopolskie voivodship. At the same

time, this limitation suggests an important future research question: Are there any specific characteristics of the labour market in this region which encourage or discourage young people to undertake own businesses? This question can also be confronted with a discrepancy between students' plans and the real proportion of graduates running their businesses. Surveys carried out among students demonstrate that this career path is often declared. Over two-thirds of Polish students (73.2%) perceived themselves as entrepreneurial persons. Almost half of the students (42.3%) had an innovative idea for the business and 26.9% declared to choose this career path after studies (Kunasz, 2008). However, there is a lack of data that verifies the level of putting these declarations into practice. Generally, in Poland, the percentage of fresh alumni starting their own business after graduation is calculated at around 2-10% and is varied depending on the type of HEIs.

Furthermore, the article was based on data collected before the Covid-19 pandemic, when the labour market was completely different, particularly for individuals running their businesses. Finally, we cannot forget that data in the vast majority related to young entrepreneurs, who are the most vulnerable to various crises. For this reason, the presented analysis should be revised after the pandemic.

The direction of future research may consist in including the differences between various HEIs. It might be applied by using and comparing data from Polish Graduates Tracking System. Another area for developing future research is including some macro-level variables (such as the unemployment rate or this directly connected with entrepreneurship 'climate,' *i.e.* Doing Business Indicators). The third new research field is a trial to confront country data with some international students' or graduates' surveys (*e.g.* Eurostudent) in terms of entrepreneurship.

The most practical implication is that the analysis results can be used when preparing the University's educational offer to provide students with some entrepreneurial skills. The differences between faculties should be considered. Additionally, University careers advisors are provided with knowledge of entrepreneurship's determinants.

However, in interpreting the data and results presented in this article, it is important to remember that there are many determinants of choosing an entrepreneur's career. The role of the HEI diploma has not been proven to be the most important in this process (Greene & Saridakis, 2008).

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Conflict of Interest

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