EE
E u r o E c o n o m i c a
Issue 2(38)/2019 *ISSN: 1582-8859*

Stakeholders' Perception for Development of an Entrepreneurial and Innovative Institution

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Abstract: The present paper aims at showing the way in which we can determine the importance given to a higher education institution, on the basis of its self-assessment, by the internal and external stakeholders, using the HEInnovate tool. The objective of the work was to identify the most relevant aspects of the entrepreneurship and innovation in a higher education institution (HEI) from Romania, by establishing the level of the perceptions of the main groups involved in the evaluation. As study methods, the semantic differential (SD) and One-Way Analysis of Variance (ANOVA) were used. Also, to determine the groups of respondents that participate in the self-assessment, between which there are significant differences of perception, the Least Significant Difference (LSD) was used. Research revealed that the respondents perceived as equally important all pillars, giving them a favorable score (average score) ranging between 3.51 and 3.81.

Keywords: HEInnovate tool; pillars; level of perception; analysis of variance; least significant difference

JEL Classification: L26

1. Introduction

In the recent years, in Romania there has been an increasing emphasis on the fact that the HEIs have to contribute to creating a favourable environment for the development of the entrepreneurship and innovation. This implies an appropriate behaviour to address the multiple pressures faced by the HEIs today. These pressures include, in particular, the employers' desire to recruit graduates to help them to improve their innovation and competitiveness, as well as the governments seeking solutions to combat the graduate unemployment.

The future of the higher education from Romania is a preoccupation intensely national awareness, focusing on the education and training objectives, as a result of their influence on economic growth. This influence is concretized by increasing the employment, productivity, participation and skills training, etc.

The studies carried out on the future of the Romanian higher education have highlighted the potential of the universities to adapt to the requirements of the stakeholders, and especially of the students, as being a key factor in creating value and attracting resources to universities.

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The internationalization and the globalization of the labour market have led to changes in the demand for competences of the higher education graduates. Thus, in addition to the professional competences, there are necessary communication skills, entrepreneurial skills, cultural skills, flexibility, initiative, leadership abilities, and willingness to learn permanently (Rauhvargers, 2004, p. 335; Holland, 2009, p. 338).

The main objective for the development of the higher education in Romania is to concentrate the efforts on our country to join, by 2030, the group of Europe's most advanced economies. To this end, the higher education institutions need to focus on the creativity and innovation, focusing increasingly on the learning outcomes and developing skills recognized by employers (Petcu at all. 2015, p. 63).

In a global economic environment corresponding to the information technology era, where the innovation represents the basis for creating a competitive and intelligent economy, the universities become important research and learning centres that need to rethink and redesign their organization and operation. Only in this way a HEI can respond to the new challenges, without giving up to the fundamental principles and values that define it (Gumport, 2000, p. 82; Bleiklie and Kogan, 2007, p.480).

Nowadays, more than ever, there is a clear incentive for the universities to develop the entrepreneurial capabilities in a broad spectrum of students and graduates, to provide learning opportunities that stimulate entrepreneurial thinking and entrepreneurship actions.

Drucker, in his work (1985), has identified the specific business tool-the innovation, claiming that it can be improved by those who think, behave and act in an entrepreneurial manner.

Due to the evolution directions and challenges faced the universities at international, European and national level, in their relationship with other entities in the community, there is a growing emphasis on the need to replace the classical model centred on teaching and research with an innovative and entrepreneurial model, which aims to provide, graduates with innovative and entrepreneurial ideas.

HEIs in Romania recognize their role in education for innovation and entrepreneurship designing a new educational model focused on innovation and entrepreneurship, aiming cultivating the entrepreneurial spirit of the students and practical skills, as well as promoting employment through entrepreneurship.

In the academic environment, the entrepreneurship is seen as the development of a set of behaviours, abilities and individual attitudes characterized by the entrepreneur (Gibb and Hannon, 2006, p. 91; Aarstad, 2014, p. 269).

A HEI can have an entrepreneurial component by the way by which it creates and uses the synergies between teaching and research activities, through the support given to the start-ups and the exchange of experience and information to increase the innovation capacity of the existing firms, by the ways of managing their resources and involvement of the stakeholders in the administrative and leadership activities (Gibb, 2012, p. 17).

Today, the HEI have at their disposal the independent self-assessment tool HEInnovate, which was developed by the General Directorate for the Education and Culture of the European Commission in partnership with the OECD Forum (Organization for Economic Cooperation and Development), which

is used as a source of learning by the higher education institutions in Europe (Organization for Economic Cooperation and Development, 2012).

The present work aims to present the self-assessment of a higher education institution from Romania (Dunarea de Jos University-UDJG) using the HEInnovate tool, the answers obtained on this platform giving the possibility of comparing the pillars analysed based on the respondents' level of perception on developing an entrepreneurial and innovative institution. It also seeks to identify the significant differences in the perceptions between the different groups participating to the self-assessment.

2. A General Framework of Entrepreneurship, Challenge for the Romanian Universities

Entrepreneurship means using of the resources in an innovative, progressive and value-creating manner (Korpysa, 2012, p. 467). It promotes the intersection of disciplinary and informational boundaries in teaching and research, and enables to the external stakeholders to engage in everything that is related to the leadership and organizational capacity of the HEI (Clark, 2004a, p. 82).

Within the universities and their relational environments, by entrepreneurship it can be promoted and supported the change and development by improving the ability to act, starting from the opportunities that have emerged, transforming the universities into learning communities (Levin & Greenwood, 2001, p. 110).

It can be argued that in an entrepreneurial university the teaching, research and involvement of the society are interconnected, creating a continuous synergy and a dynamic exchange of information between leadership, administration and external stakeholders (Entrialgo and Iglesias, 2016, p.1220). An entrepreneurial university is organized so that both professors and students and other employees can prove their spirit of innovation and creativity in teaching and research by using the information they have acquired. In a social environment characterized by insecurity and complexity, they effectively contribute to the improvement of innovation, actively involved in a process of discovery and exchange of experience with local, national and international stakeholders (Salmi, 2009, p. 57).

Due to the extremely complex environment in which we live, there are more and more challenges faced by a HEI.

One of these challenges relate to the profound changes in the production of new information. Because of this, a HEI is exposed to wide-ranging changes regarding the relationship between science and the economy, that involve both challenges and new opportunities to think, create and transmit the new technologies (Etzkowitz et al., 2012, p. 151).

Due to the global information technology revolution, which has led to the expansion of the information sources, today no university or even the entire higher education sector can claim to have absolute control of knowledge (Kwiek, 2012, p. 24).

In general, the academic community has not been able to keep up with all these developments, the independence of the academic discoveries and teaching processes, being still present, plus the fact that the way of thinking is shared by all members of the university environment. But these issues are beginning to change, the universities being forced to focus on useful sources of information to solve

problems, to create partnerships for learning, beyond the boundaries of a strict discipline, thus promoting the transdisciplinarity by exploiting and sharing the information in different ways. Only in this way the universities can explain and transmit information to other audience categories.

Another challenge for a HEI is the reorganization of education so that it stimulates and facilitates learning, the graduates being aware of the latest information specific to the studied, but at the same time acquiring social skills (O'Neill & McMahon, 2005, p. 33). All the available internet information existing to the disposal of the students allows them to access new learning channels that question the traditional teaching methods. Students are thus challenged to find more sources of information and to find new solutions, the professors having the role of facilitating the learning process (Etzkowitz et al., 2012, p. 157).

Improving the professional insertion and the creation of graduate entrepreneurs is another challenge for a HEI (Habibov et all. 2017, p.492). These requirements arise as a result of the labor market changes at a rapid pace, the employers looking for graduates to get to business, solve problems, communicate, approaching the teamwork, mastering information technology and being open to the new ideas, willing to work to create value. All these involve entrepreneurial skills and abilities. To achieve such results, a learning environment and teaching strategies are needed to encourage the students to master their learning process and provide them the opportunity to experience and exploit the information.

Creating a synergy between education and research, as well as wider networks between the universities and employers lead to a better insertion (Mevlin & Pavlin, 2012, p. 176).

Set up the start-ups with the education helping is another challenge for a HEI because the setting up of an own business is a career option in which the education plays a fundamental role. In order to achieve this, it is especially important to have the appropriate skills and competences, the motivated people in this direction having skills to identify opportunities and turn the entrepreneurial projects into successful companies (Tomy & Pardede1, 2017, p. 270).

The existence of relevant and accessible research programs is another challenge that a HEI must take into account, these have an essential role to play in improving the development and sustainability. This implies the existence of an environment that allows the application and exchange of information and technology with the outside world, as well as with entrepreneurs (Levin, 2007, p.49). The higher education institutions need to be open and receptive to the real-world issues to transform research results into products and services. At the same time, they must allow to the students and researchers to develop innovative solutions to disseminate them and, on the other hand, to work with external stakeholders to strengthen the institution's "entrepreneurial capacity". In this respect an approach based on information exchange networks is needed (Perkman et al., 2013, p.439).

Another challenge is the inclusion in the university strategy of the internationalization process. The internationalization allows the students and professors to study and teach, respectively in another country. This leads to the improvement of the academic entrepreneurial spirit, due to exposure to the new research environments and new opportunities (Santos-Álvarez & García-Merino, 2016, p. 4). Such approach encourages the strategic thinking that leads to innovation and modernization in teaching, while also stimulating the collaboration between students and faculty, which can lead to the opening of new research paths. Thus, valuable benefits can be gained for the students as well as the faculties and

universities as a whole (Krabel et al., 2012, p. 198; Organization for Economic Cooperation and Development, 2012).

Another challenge is how the higher education institutions manage the financial crisis, with an impact on the strategic decisions and on the ability to attract funding. These issues drive the higher education institutions to be more oriented towards the entrepreneurial (Shattock, 2010, p. 265).

Another challenge for the higher education institutions is how they create partnerships with stakeholders they work with (Altbach et al., 2009, p. 30). Each HEI is a complex organization in which each discipline is confronted by different stakeholders from different backgrounds, with a certain involvement in knowledge creation, but also in the process of sharing information or using them (Moses, 2005). For the institution to be actively involved, all stakeholders need to develop their capacity to recognize the collaboration opportunities and to communicate them to the stakeholders (Klofsten, 2013, p. 65).

All these challenges faced by the higher education institutions have a significant impact on their management.

For a higher education institution to act in an entrepreneurial and innovative manner, it is necessary to overcome the most difficult barriers, such as the intellectual or ideological beliefs of academic staff, which can result from mistaken perceptions and myths about meanings, values and goals of the entrepreneurship (Altbach et al., 2009, p. 15).

The management of the institution must be involved in providing the alternative interpretations that have the resonance and significance for teaching and research.

In order to explore the entrepreneurial potential of a HEI, as a base for the future change and development a certain level of autonomy is needed, both at the staff level and at the level of the institution as a whole (Clark, 2004b, p. 356).

The starting point for a good adaptation of the institution to the changes is to build a common and shared vision regarding what supposes as a HEI to be entrepreneurial, in a certain socio-economic context and with an organizational and individual development strategy, where the providing of a strong reasoning and academic argumentation are essential for promoting the entrepreneurship throughout the institution, in all disciplines and across all the levels of study (Clark, 2004b, p. 359).

The way in which the HEI sees the entrepreneurship is influenced by the existing culture, the legislative and political framework, as well as the way in which it operates.

It can be argued that there is no unique model, but various ways that promote "entrepreneurship as a method" (Sarasvathy & Venkataraman, 2011, p. 114).

The implications of the institutional changes are related to the fact that the involvement of professors in the entrepreneurship programmes means commitment, but also permanent support from the management of the institution, encouraging the initiatives, so that the whole academic community can establish their entrepreneurial agenda. This depends to a large extent on the presence of the top performers who promote the entrepreneurship and innovation and integrates them into the higher education practices.

An entrepreneurial HEI has a series of features that take the form of seven pillars: administration and leadership, organizational capacity required for funding, people and incentives, teaching and learning of the entrepreneurship, the entrepreneurs are trained and supported, the collaboration and exchange of knowledge and information, the international dimension of the institution, measuring the impact of the changes.

A proper administration and a strong leadership are factors that play a fundamental role in the entrepreneurial development of the HEI. They can stimulate innovation within an institution that operates on the basis of shared vision and values, through the transparent communication between the institution's management and stakeholders, commitment, flexibility and co-operation with the business and the community (Bleiklie & Kogan, 2007, p. 479).

Entrepreneurial higher education institutions are proposing the permanent development of their organizational capacity. The implementation of a strategy to support the institution in developing an entrepreneurial and innovative approach involves attracting the key resources (investment and financing) and people to engage in innovation, who have the knowledge and expertise needed to develop the entrepreneurial capacity. In order to be able to give power and trust to those in the institution to engage in innovation and develop the synergies by building trust-based relationships with external and internal partners, they must be rewarded to achieve the proposed results (Salmi, 2009, p. 82).

Teaching and learning entrepreneurship requires using innovative methods and ways of stimulating the entrepreneurial thinking. For this, the higher education institutions offer formal learning opportunities as well as facilitating the access to non-formal learning experiences, whereby students and professors to inspire by practical and interactive activities, to initiate real business and exchange knowledge in events, competitions or meetings with entrepreneurs. The design and implementation of the entrepreneurial curriculum is carried out by the HEI together with the outside stakeholders (O'Neill & McMahon, 2005, p. 33).

An important step in changing the adopted strategy is to create a learning environment that stimulates the entrepreneurial thinking for students and professors within the HEI. This has to convince the students and graduates that the entrepreneurship is a viable career option, supporting them to develop their skills and to implement the business ideas by providing the personalized assistance by the experienced academic staff. Also, the HEI facilitates the access to finance for its entrepreneurs and provides training and consulting programs in collaboration with business to help the students and graduates set up in leading and developing a business (Kuratko et all., 2004, p. 76).

A HEI can create added value if at the organizational level it strives to stimulate the entrepreneurial approaches and innovation, thus becoming a driver of the economic growth. In this respect, the exchange of the experience plays an essential role in stimulating the institutional innovation and progress in teaching and research. HEI is actively involved in partnerships for joint projects (educational activities, learning programmes, research projects), providing a framework for the knowledge and experience exchange, being dedicated to the collaboration with industries, the public sector and the society as a whole (Taylor, 2000, p. 108).

In order to evaluate the quality of the higher education, the notion of the internationalization is frequently used. Internationalization is a tool that leads to changes and improvements, which determine different

ways of thinking, ensuring the openness of the management process to the outside parties. HEI supports the international mobility and the involvement of the stakeholders in the institution in international projects, which contribute to the generation of new ideas, innovation, openness, lessons learned, good practice models, cooperation, the elimination of cultural and communication barriers, networking and effective partnerships (Coyle & Haskins, 2013, p. 10).

Any entrepreneurial HEI needs to understand the impact of changes taking place within the institution, with a few recommendations regarding the areas and indicators that can effectively assess the impact of the actions to develop entrepreneurial and intrapreneurial approaches. Through a constant analysis and careful monitoring, it is possible to establish the directions and the measures for improvement of some actions. Thus, to measure impact, the HEI regularly evaluates: the impact of its entrepreneurial program, the teaching and learning of the entrepreneurial notions, the way people and resources support the entrepreneurial agenda, the exchange of experience and collaboration, the activities that the institution carries out at international level regarding the entrepreneurship programme and the impact of the support offered to the start-ups (Fayolle & Gailly, 2013, p. 76).

Usually, the impact measurement carried out by the HEI emphasizes the amount of the spin-offs created on the basis of the research results obtained by the institution, and the volume and quality of the intellectual property generation.

Due to the fact that, in the current context, a HEI is evaluated according to the ways in which it responds to the economic and social needs of the society, the issues that addresses, besides the education and research, refer to: the short-term and long-term contributions by which it has to achieve the economic growth at national and local levels, the professional insertion of graduates, a wider access to higher education of disadvantaged groups, stimulation of new businesses and the introduction of innovation into the existing ones, etc. HEI is becoming innovative and entrepreneurial, as a reaction to all these aspects, and the ways in which it can act in an entrepreneurial way are many, of which: promoting the entrepreneurship spirit and innovation through the education, supporting the creation of the new companies, the exchange of knowledge and experience that leading to the enhancement of the innovation capacity of existing companies, the creation and cultivation of synergies between teaching and research, etc. (Barba-Sánchez & Atienza-Sahuquillo, 2017, p. 1098).

3. Data and Method

Data collection and sample

The objective of the research is the UDJG self-assessment using the HEInnovate tool, based on the perception of the stakeholders involved in the self-assessment of the entrepreneurial and innovative characteristics of the institution.

Starting from this goal we have formulated the following hypotheses:

• H1: Respondents perceive with the same intensity all items;

• H2: There are no significant differences between the pillars analyzed;

• H3: Respondent groups perceive in a different way the items which have the highest score, from the pillars analysed.

The study was conducted between May and June 2016 on the basis of a questionnaire which contains a series of statements (items) within seven dimensions (pillars), on the entrepreneurial and innovative nature of the institution's organizational environment were completed. The questionnaires were completed from the perspective of the individual user.

Heinnovate experimental tool was applied in three faculties (Faculty of Naval Architecture, Faculty of Engineering and Faculty of Economics and Business Administration) on a sample of 299 people. We consider that the sample is representative because it is formed both by the students, employees and specialists in the field who can appreciate the entrepreneurial characteristics of the UDJG. The sample of respondents consists of three groups: students, non-students (professors, deans, pro-rectors, department managers, experts, researchers, postdoctoral students, external stakeholders) and anonymous.

The structure of the sample is shown in Table 1.

Table 1. Structure of the sample of respondents

	Students	Non-students	Anonymous
Number	172	67	60
%	57,5%	22,4%	20,1%

The questionnaire was completed on the personal workplace computer for the non-students and from the university for the students. All respondents were informed about the objectives of this study and the confidentiality of data. The large number of the respondents in this self-assessment ensures that the results obtained are representative for the institution in which we conducted the study.

In this way, HEINnovate provides a powerful and useful platform for accurately assessing of the perceptions of all interested and relevant stakeholders on the development of an entrepreneurial and innovative university.

Respondents appreciated the statements about the entrepreneurial and innovative nature of the organizational environment of the UDJG for each of the seven pillars, each consisting of five or six items. Using a five-level scale (where 5 is very favorable and 1 very unfavorable), the assessments made by the selected sample of 299 people have been quantified, regarding the statements related to the entrepreneurial and innovative nature of the institution's organizational environment. Investigated respondents were asked to indicate on the scale the level corresponding to the intensity of the perceptions on the items corresponding to each pillar under evaluation.

In order to process the data obtained from the self-assessment with HEInnovate tool, the SD, also known as the Osgood’ scale and the Anova method, was used. SD was used to determine the respondents' perceptions on the 7 pillars regarding the entrepreneurial nature of UDJG. It is based on the weighted average calculation for each item, depending on the responses within the self-assessment for each level, and the simple arithmetic mean for comparing the pillars in terms of the respondents' perceptions.

Anova method has been used to determine whether there are significant differences in the perception of the respondents on the importance of the pillars analyzed and how the three groups of the respondents perceive items with the highest score.

The method is based on the Fisher test. To highlight the groups between which there are significant differences, the LSD (Least Significant Difference) method was applied.

4. Results and Discussions

4.1. Perceptions of the respondents on the items related to the entrepreneurial nature of the UDJG

Based on the data obtained from the self-assesssment, using SD method, we calculated the weighted arithmetic mean of the answers for each item, which reflects, through an average score, the global perception of the whole sample.

The responses of the 299 respondents on their perception of UDJG's entrepreneurial nature and the weighted arithmetic mean (average score), centralized on pillars and items are presented in Table 2. Based on the data in this table, the hierarchy of the items was made according to how they were perceived by the whole sample.

Table 2. Coding, Description and the Average Score of the Items in the Seven Pillars

Code	Item Description	Average score
Pillar 1 Administration and leadership		
IQ1	Entrepreneurship is an essential part of the strategy of a higher education institution	3.70
IQ2	Commitment to implement the entrepreneurial agenda exists to the highest level	3.67
IQ3	Entrepreneurial activities are coordinated and integrated into the UDJG based on an existing model	3.62
IQ4	The faculties and units of UDJG are encouraged and supported to act in an entrepreneurial manner	3.81
IQ5	For regional, social and community development, UDJG is a driving force in the field of entrepreneurship and innovation	3.73
Pillar 2 Organizational capacity required for funding, people and incentives		
IIQ1	A wide range of sustainable funding and sources of investment support the entrepreneurial goals	3.58
IIQ2	The promotion of the new relationships and synergies can be achieved based on an adequate capacity and culture that the UDJG holds	3.79
IIQ3	Employing and recruiting people with attitudes, behaviours and entrepreneurial experience are part of the UDJG strategy	3.72
IIQ4	In order to sustain its entrepreneurial agenda, HEI invests in the personnel development	3.65
IIQ5	Employees who actively support the entrepreneurial agenda of the UDJG receive incentives and rewards	3.62
Pillar 3 Teaching and learning the entrepreneurship		
IIIQ1	In order to develop a way of the entrepreneurial thinking and related skills, UDJG offers different formal learning opportunities	3.76
IIIQ2	To stimulate the development of thinking and entrepreneurial skills, UDJG offers diverse opportunities and experiences of non-formal learning	3.75

IIIQ3	The results of the entrepreneurial education, which stimulate the design and implementation of the entrepreneurial curriculum, are validated by the UDJG	3.52
IIIQ4	The curriculum is designed, ensuring its delivery by the UDJG alongside external stakeholders	3.56
IIIQ5	Entrepreneurial educational offer integrates research results in the field of entrepreneurship	3.75
Pillar 4 The entrepreneurs are trained and supported		
IVQ1	Increase the awareness of the value of entrepreneurship and encouraging students, graduates and employees to set up a business is provided by UDJG	3.74
IVQ2	Students, graduates and employees are supported by UDJG to put their ideas into practice by setting up a business	3.66
IVQ3	To help students, graduates and employees to set up, lead and develop a business UDJG offers training programmes	3.69
IVQ4	Experienced people in the academic world offer mentoring and personal development activities	3.7
IVQ5	Access to funding for its entrepreneurs is facilitated by the UDJG	3.59
IVQ6	Access to business incubators is facilitated by the UDJG	3.56
Pillar 5 The collaboration and exchange of knowledge and information		
VQ1	Collaboration and the exchange of information and knowledge with different industries, the public sector or society as a whole are part of the UDJG strategy	3.67
VQ2	Active involvement in partnerships and relationships with various stakeholders is demonstrated by the UDJG	3.64
VQ3	UDJG offers opportunities for knowledge sharing by establishing links with business incubators and technology parks	3.51
VQ4	UDJG offers the necessary facilities for employees and students to participate in innovative business activities	3.75
VQ5	To explore new knowledge UDJG integrates research, education and industrial activities	3.74
Pillar 6 The international dimension of the institution		
VIQ1	UDJG 's entrepreneurial agenda integrates internationalization	3.54
VIQ2	International mobility of the employees and students are explicitly supported by UDJG	3.77
VIQ3	The search and attraction of the entrepreneurs are carried out by UDJG	3.57
VIQ4	UDJG has face to the teaching and learning approach that reflects the international perspectives	3.65
VIQ5	The way how UDJG addresses the research reflects the international dimension	3.66
Pillar 7 Measuring the impact of the changes		
VIIQ1	The impact of the entrepreneurial agenda of UDJG is regularly evaluated by it	3.51
VIIQ2	The manner in which UDJG staff and resources support the entrepreneurial agenda is assessed on a regular basis	3.52
VIIQ3	The teaching and learning of the entrepreneurial notions within the institution are regularly evaluated by UDJG	3.57
VIIQ4	The impact of the support that UDJG offers to start-ups is regularly evaluated by it	3.58
VIIQ5	The exchange of knowledge and collaboration is regularly evaluated by UDJG	3.80
VIIQ6	The activities that UDJG carries out at an international level regarding the entrepreneurial agenda are regularly evaluated by it	3.59

Analyzing the data from Table 2 we can see that all items of the seven pillars, as a result of the self-assessment by the respondents, have been perceived with an average score between 3.51 and 3.81, which on a scale of 1 to 5 corresponds to a favorable perceptions.

The variation of the average score of the items between 3.51 and 3.81 shows the existence of small differences in the perception of the different items. These differences occur between the items of the same pillar, as well as between the items of the different pillars. The biggest difference between the highest average score (3.80) and the lowest average score (3.51) is found at the pillar 7. In fact, here, except the VIIQ5 item, which has achieved the highest score, all other items have an average score below 3.6, which means that respondents appreciate the fact that UDJG regularly evaluates the exchange of knowledge and the collaboration, while the impact of the entrepreneurial agenda (VIIQ1) is appreciated weaker.

The smallest difference of the average score between the items appears at the pillars 2 and 4, with scores ranging between 3.79 and 3.58 and 3.74 and 3.56 respectively, meaning that all the statements within these pillars are perceived as equally important for achieving the targets by the UDJG regarding the development of an innovative entrepreneurial culture. An important role is making the most of key resources, such as financing and investment, people, expertise and knowledge, as well as providing by the UDJG of the personalized assistance to generate and implement ideas and set up a business as a career option for the students, graduates and employees.

Among the items that have obtained the highest score are IQ4 (3.81), which shows that the faculties and units of UDJG are encouraged and supported to act in an entrepreneurial manner and IIQ2 (3.79), through which the respondents appreciate that the promotion of the new relationships and synergies can be achieved based on an adequate capacity and culture that the UDJG holds.

Among the items with the lowest average score we notice VQ3 (3.51), which states that UDJG offers opportunities for knowledge sharing by establishing links with business incubators and technology parks, as well as IIIQ3 (3.52) showing that the results of the entrepreneurial education, which stimulate the design and implementation of the entrepreneurial curriculum, are validated by the UDJG.

Considering that all items of the seven pillars have been perceived favorably (level 3÷4 of the used scale of 1÷5), it results that the H1 hypothesis is verified.

4.2. Comparison of the Pillars in Terms of the Respondents' Perceptions

In order to compare the pillars in terms of respondents' perceptions, the average arithmetic of the scores of the items for each pillar was calculated. The obtained values are represented in Figure 1.

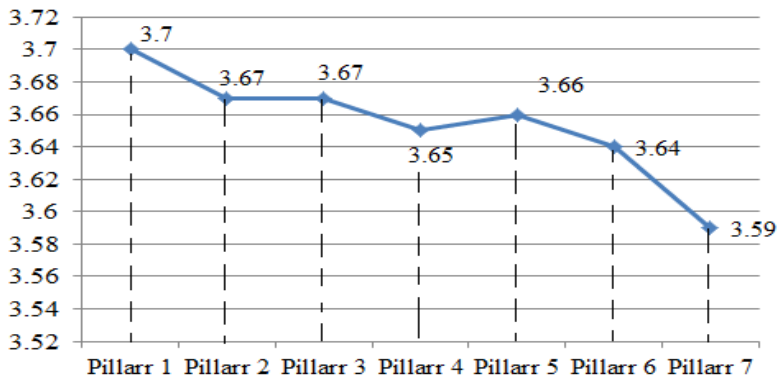

Figure 1. The Arithmetic Average of the Pillars

As shown in Figure 1, there are no appreciable differences in the perception of the respondents for the 7 pillars, their average being between 3.59 and 3.70, ie between 3 and 4 on the levels scale used in the self-assessment. It is noted that the pillar 1 has the highest average (3.70), which shows a preferential perception for administration and leadership, and the pillar 7 as having the lowest average.

To see if the differences between the pillars analysed are significant, we have used the One-Way Analysis of Variance-ANOVA and the F (Fisher) test. For the study we took into account the average scores obtained for the 7 pillars (Figure 1).

We are launching the null hypothesis that there are no significant differences in the perception between the three groups:

H0: $\overline{x_1} = \overline{x_2} = ... \overline{x_7}$ (the hypothesis regarding the equality of the average score of the seven pillars), with the alternative hypothesis: Ha: ($\exists$) $\overline{x_i} \neq \overline{x_j}$, i ǂ j (at least two averages are not equal).

The threshold of significance chosen is $\alpha = 0.05$.

In this method, where the only factor taken into study is the average score of the pillars, the Sum of Squares Among groups (SSA), Sum of Squares Within Groups (SSW) and Sum of Squares Total (SST = SSA + SSW) have been calculated. The dispersions then resulted (MSA-Mean Squares Among groups; MSW-Mean Squares Within groups; MST-Total Mean Squares) and the value of the statistical parameter F, to verify the null hypothesis has been calculated (Table 3).

Table 3. Synthesis of Data Calculated for the Pillars in the one-way ANOVA

The type of variance	The number of freedom degrees	The variation (the sum of squares of deviations)	The corrected variances	Test F
Among groups	k-1=6	SSA=0.038	MSA= $\frac{SSA}{k-1}$ =0.00643	$F_{calculated}= \frac{MSA}{MSW}$ = =0.143
Within groups	n-k=30	SSW=1.343	MSW= $\frac{SSW}{n-k}$ =0.04477	
Total	n-1=36	SST=1.381	MST= $\frac{SST}{n-1}$ =0.03836	

Based on the results from Table 3 we have compared the calculated value of the statistics $F_{calculated}$ =0.143 with critical value F_{critic}=FINV(0.05; 6; 30) = 2.42.

Because F_{critic} =2.42 > $F_{calculat}$=0.143 and hence it is accepted the null hypothesis H_0.

It follows that the H2 hypothesis is verified, meaning that the respondents perceive with the same intensity all the analyzed pillars, and between the pillars there are no significant differences of perception, with a probability of 95%.

4.3. Analysis of the Differences in Perceptions of Different Groups of Respondents

To verify the third hypothesis (H3) of the research on the existence of significant differences of the perceptions between the groups of the respondents regarding to the items with the highest average score from the pillars,we considered only the items that obtained the highest average score after the analysis performed with the SD method: IQ4, IIQ2, IIIQ1, IVQ1, VQ4, VIQ2, VIIQ5. For this aspect of the research, the One-Way Analysis of Variance ANOVA. For this study, the average of the responses of the three different groups of respondents regarding the analyzed items were considered (students, non-students, anonymous) (Table 4).

Table 4. Responses' Average from the Self-Assessment

Students	Non-students	Anonymous
$\overline{x_1}$ =117.57	$\overline{x_2}$ =40.86	$\overline{x_3}$ =41.71

We are launching the null hypothesis that there are no significant differences in the perception between the three groups:

H_0: $\overline{x_1} = \overline{x_2} = \overline{x_3}$ (the hypothesis regarding the equality of the three groups' averages), with the alternative hypothesis: H_a: ($\exists$) $\overline{x_i} \neq \overline{x_j}$, i ≠ j (at least two averages are not equal).

The threshold of significance chosen is $\alpha = 0.05$.

Analyzing the data in Table 4, it is observed that there are differences in the perception of the three groups of the respondents over the items considered. In order to be able to assess whether these differences are significant (in which case the results can be extended to the entire sample of self-assessment, from which the three different groups were extracted, considering that the number of respondents in these three groups constitutes a representative sample for research) or if they are not generated by the random sampling errors, the difference between groups is checked using the Fisher test.

In this method, where the only factor taken into the study is the response of the three groups of respondents from UDJG self-assessment, we calculated the indicators in Table 5.

Table 5. Synthesis of the Data Calculated for the Three Groups in the one-way ANOVA

The type of variance	The number of freedom degrees	The variation (the sum of squares of deviations)	The corrected variances	Test F
Among groups	df1=k-1=2	SSA=27160	MSA= $\frac{SSA}{k-1}$ =13580	$F_{calculated} = \frac{MSA}{MSW}$ = =898.742
Within groups	df2=n-k=18	SSW=272	MSW= $\frac{SSW}{n-k}$ =15.11	
Total	n-1=20	SST=27432	MST= $\frac{SST}{n-1}$ =1371.6	

Based on the results from Table 5, we have compared the calculated value of the statistics $F_{calculated}$ (898.742) with F_{critic} (F_{critic}=FINV(0.05; 2; 18) = 3.554).

Because F_{critic} =3.554< $F_{calculat}$=898.742 and hence it is rejected the null hypothesis H_0

This leads to the conclusion that there are significant differences between the groups analyzed.

Consequently, the H3 hypothesis is verified with a probability of 95%, that means the groups of the respondents perceive in a different way the items with the highest score in the pillars analysed.

To highlight the groups between which there are significant differences, the averages comparison procedure was applied. For this purpose the LSD method was used.

In the LSD method the hypothesis are:

H_0: $\overline{x_1} = \overline{x_2} = \overline{x_3}$ (the hypothesis regarding the equality of the three groups' averages), with the alternative hypothesis: H_a: ($\exists$) $\overline{x_i} \neq \overline{x_j}$, i ≠ j (at least two averages are not equal).

Then, the Dij test statistic was calculated as the difference between the mean of the groups, and for the decision, the critical statistic of the LSDij test was calculated. The calculation was made for a number of seven samplings of the samples i, j. The threshold of significance chosen is α = 0.05.

The found value LSD_{ij} =4.363 for $t_{\alpha/2}=t_{0.025}$=TINV(2 x 0.025; 18)=2.1009.

If $D_{ij}<LSD_{ij}$ → accepting of the H_0 hypothesis

If $D_{ij}>=LSD_{ij}$ → accepting of the H_a hypothesis

The final decision on accepting or rejecting the H_0 hypothesis is given in Table 6.

Table 6. The Procedure of Comparison of the Averages

Groups	Students	Non students	Anonymous
Mean	$\overline{x_1}$ =117.57	$\overline{x_2}$ =40.86	$\overline{x_3}$ =41.71
$\overline{x_1}$ =117.57	D_{11}=0	D_{21}=76.71>4.363→H_a	D_{31}=75.86>4.363→H_a
$\overline{x_2}$ =40.86	D_{12}=76.71>4.363→H_a	D_{22}=0	D_{32}=0.85<4.363→H_0
$\overline{x_3}$ =41.71	D_{13}=75.86>84.363→H_a	D_{23}=0.85<4.363→H_0	D_{33}=0

Since D_{12} and D_{13} are higher than the LSD value, according to the LSD method, the null hypothesis has been rejected only for groups 1 and 2 and 1 and 3, and for 2 and 3 the null hypothesis has been accepted. D_{23} being less than the LSD value, this means that between the group of the students and the other two groups (non-students and anonymous) there are significant differences of perception for the analyzed items, regarding the entrepreneurial nature of UDJG while between the groups of the non-students and anonymous there are no significant differences of perception.

5. Conclusions

The complex environment in which a HEI carries out its work makes this one to face a series of challenges. These have a significant impact on the administration way and management of the institution.

To meet these challenges, the HEI have to make efforts, that at an organizational level to stimulates entrepreneurial approaches and innovation.

The ways in which a HEI can become innovative and oriented towards entrepreneurship are multiple: creating a learning environment and adopting teaching strategies that encourage students to study, give them the opportunity to experience and exploit information, so that at the graduation to have skills and competences that allow them a good insertion; promoting the entrepreneurship and innovation through education, creating a synergy between the education and research; creating an environment that allows for the application and exchange of information and technologies that enhance the capacity for innovation, openness to new ideas.

Having entrepreneurial and innovative approaches, the HEI will be able to deliver graduates on the labor market not only professionally trained, but also with entrepreneurial abilities, open to the new ideas, willing to work to create value.

The research carried out in the present paper on the perception of three groups of respondents (students, non-students and anonymous) on the entrepreneurial nature of UDJG, used a series of statements (items) within seven dimensions (pillars), expressing the entrepreneurial and innovative characteristics of the institution and a scale of levels from 1 to 5 for the perception. Based on the SD analysis, it was found that all items and pillars analyzed were perceived to be about as important. The average score of the items ranges between 3.51 and 3.81, and for the pillars between 3.59 and 3.70, which on the used scale of the levels in the self-assessment corresponds to a favorable perception.

Taking into account the items with the highest scores, it appears that the respondents perceive as being very important that UDJG acts to raise the awareness on the value of the entrepreneurship and to encourage the students, graduates and employees to make informed decisions about their career and to open their own business (IVQ1). Also, the respondents appreciate that UDJG offers the necessary facilities to participate in innovative business activities (VQ4), stimulates the international mobility through scholarships, exchange programs and internships (VIQ2).

The ANOVA analysis on the respondents' perception on the pillars, where the only factor taken into the study has been the average obtained by the seven pillars, has showed that there are no significant differences in their perception.

Hierarchizing, however, the pillars by their average, it has been observed that the respondents put on the first place the pillar 1 (Administration and leadership), and on the last place the pillar 7 (Measuring the impact of the changes).

Referring us to the perception of the three groups of respondents, for the analyzed items that have been obtained the highest score in the SD analysis, applying the ANOVA, we have found the existence of significant differences of perception between the groups.

LSD analysis has highlighted the groups between which there are significant differences in perception. Such differences exist between the group of the students and the other two groups (non-students and anonymous), while there are no significant differences in perceptions between the groups of the non-students and anonymous.

It follows that the perception of the respondents on the entrepreneurial approaches and innovation by the UDJG depends on their position towards the institution.

The debate on the HEInnovate is a rich experience, the participants in the questionnaire having the opportunity to freely express their own experiences with the tool used. All these have led to the important discussions about the perception that each participant has about the entrepreneurship.

Acknowledgements

This work was carried out in the framework of the research project Entrepreneurship University 2016-2018, supported by the Junior Achievement Romania (JA Ro), a member of the Junior International Organization Achievement Worldwide – www.jaromania.org.

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