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Exploring the effectiveness of university agenda for developing students' entrepreneurial behavior

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ABSTRACT

The objective of this research was to identify the main factors of influence and their level in terms of framing 'Ștefan cel Mare' University of Suceava into the pattern of the sustainable university. Firstly, we have thoroughly examined the literature and correlated it with the local practices in entrepreneurship and education. This resulted in a set of key issues which we have investigated as variables throughout a questionnaire that has been applied to 348 students from 'Ștefan cel Mare' University of Suceava (USV) in Romania. By running the Principal Components Analysis (PCA) in SPSS, we have identified which type of academic skills and competencies acquired by students are influencing the development of the university and the development of students' entrepreneurial abilities. Results indicated that a high degree of material resources available to use by respondents is associated with a high level of academic training, thus this should be a good strategy to intensify. For the second part of the analysis, we have applied the logistic regression method to measure the combined influence of factors identified throughout the PCA. Statistical analyses showed that respondents who recorded higher interactions related to the university context gained higher entrepreneurial skills and competencies.

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1. The impact of the entrepreneurial university mission

The importance of the universities' agenda has increased regarding the evolution and support awarded to entrepreneurship at European level. Entrepreneurship is considered as an important basis for the economic development by the fact that it is recognized as an active, determining, and indicative factor of the development of the economy at local and national level, with influences on the European and global level (Hapenciuc et al., 2016; Neamtu, 2017). According to Stam's (2015) arguments, an

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entrepreneur devotes time and effort to create something new, which has value due to the financial, psychological, and social risk assumed.

For the systemic approach, entrepreneurship is not just an output of the system as the entrepreneurs are at the same time important factors for creating the system as well as maintaining healthy conditions inside it (Stam, 2015). An entrepreneurial system also includes other entities (important factors), such as large enterprises, universities, financial institutions, and state-owned enterprises that support new and growing entities.

Universities are the connecting institution between all the partners of an entrepreneurial system. Universities make a significant contribution to economic growth through the combined performance of advanced research, knowledge networks, education and human capital creation and entrepreneurship. Universities have been described as 'natural incubators' (Etzkowitz, 2003, p. 111) at the very heart of innovation, creativity, and economic growth. While not all the universities are in such positions, the fact that universities need to be entrepreneurial in terms of their actions, orientation, education, structures, practices, culture, and research is increasingly recognized (Bejinaru, 2017, 2018; Fayolle & Redford, 2014).

A broadly accepted definition of the 'entrepreneurial university' is given by Etzkowitz et al. (2000) and refers to any university taking on activities to 'improve regional or national economic performance as well as the university's financial advantage and that of its faculty, differentiated from what Baldini et al. (2014) define as 'academic entrepreneurship', encompassing formal and informal mechanisms to commercialize research.

The role of an entrepreneurial university is to carefully monitor the external environment and to react quickly to the signals transmitted by the transformations that occur due to different causes. An entrepreneurial university aims to educate students so that they can successfully cope with the uncertainty and complexity that are present everywhere globally (Betáková et al., 2020; Salamzadeh et al., 2013). Moreover, to train employees capable of generating new knowledge with a high degree of practical application and thus contribute to solving the problems that are now unknown (Gibb, 2012).

This article examines the contribution of universities to supporting the regional entrepreneurial core through the study of obstacles and factors that accelerate the above-mentioned mission.

2. Importance of sustainability in the university agenda

Analysing the springs of this concept in the literature, we identified as a basic source and as a widely debated and supported vision - the document 'The Talloires Declaration' adopted by the leaders of over 500 universities in over 50 states in 1990 in Talloires, France, according to which, a sustainable university is based on the following basic 10 principles:

1. Increasing awareness of the concept of sustainable environmental development
2. Creating an institutional culture on sustainability

3. Educating environmentally responsible citizenship
4. Supporting environmental literacy for all
5. Practicing institutional ecology
6. Involvement of all stakeholders
7. Collaboration for interdisciplinary approaches
8. Supporting primary and secondary schools in the process of promoting sustainable development
9. Expanding the activity and the collaboration relations on the international level
10. Maintaining a continuous and dynamic activity

Starting from these principles, more nuanced perspectives have emerged in the scientific community regarding the definition of a sustainable university. Velazquez et al. (2006) defines the sustainable university as a system that approaches, implement, and supports at regional and global level fighting and reduces the negative effects on the natural, economic, and social environment, as well as using its resources to fulfil teaching, research and disseminating information to help society move towards a sustainable lifestyle.

Furthermore, the research followers of sustainable development in academia have identified that universities worldwide have largely adopted and adapted the principles of the Talloires Declaration into their own organizations' declarations (Lozano et al., 2013; Sylvestre et al., 2013; Wright, 2004). This practice evidence of academic vision emphasizes once more the critical importance of the university's drive for sustainability. The improvements regarding the principles and core components of the sustainable university have been recently synthesized under the title of SD leaders (Sustainable Development leaders) by Hussain et al. (2019, p. 3) as follows: '1. Curricula; 2. research; 3. operations; 4. outreach and collaboration; 5. universities collaboration; 6. assessment and reporting; 7. trans-disciplines; 8. institutional framework; 9. SD through campus experiences; and 10. educate the educators'. According to the insightful study of Lozano et al. (2013) upon the major declarations (the Talloires declaration, the Halifax declaration, the Kyoto declaration, the Swansea declaration, the Global Higher Education for Sustainability Partnership, the Luneburg declaration, the declaration of Barcelona, the Graz Declaration, the Turin declaration, and the Abuja declaration) on sustainable development of universities, the most important driver is considered teaching and learning. In this sense, we convey to the authors visible (Hussain et al., 2019) proposition that there is a strong causality between the quality of teaching and the sustainable development of higher education. A high level of teaching quality is a very attractive feature of universities for talented and competitive students as well as a reliable anchor for future employers. The quality of the educational activities will lead to gaining a good reputation on the market, thus fulfilling its essential mission - to make teaching and learning visible (Hussain et al., 2019; Ualzhanova et al., 2020).

Over time, the sustainable university has been seen, involved, and defined from several perspectives of sustainability, namely:

- the sustainable university as the equivalent of cultural endurance,
- the sustainable university as a foundation of society and education,

- the sustainable university in the modern hypostasis of ecology,
- the sustainable university as a 'new university', which minimizes tradition and emphasizes modernity.

Without disregarding the complexity and multitude of approaches, we appreciated and highlighted from an educational perspective that - a sustainable university can develop students' skills in this direction, both through formal education (according to curricula) and non-formal education (extracurricular projects) and above all through strategic leadership (Bolisani & Bratianu, 2018; Bratianu et al., 2020; Omer & Aljaaidi, 2020).

Due to the major role that universities have always played in society - it becomes implicit that - even for sustainable development - the university becomes a driver for all stakeholders.

3. Key components of sustainable university models

The complexity of the scientific works on this topic led us to reach the conclusion that the components of the sustainable university spread throughout most domains: social, economic, cultural, technological, environmental, and others. Sustainable university models - are designed in conjunction with multiple other areas such as the economic area, the social area, or even the political area. Following, we present a series of similar proposals regarding the key elements of the sustainable university, as follows:

- Velazquez et al. (2006) leads the topic, being among the first who launched such a model and presently one of the most complex and well-known models that represented a reference for the studies that followed.
- Lukman and Glavic (2007, p. 107) continued the efforts by analyzing and arguing the similarities of the sustainable university model to Deming's cycle (PDCA), considering it as a spiral for the scope of continuous improvements. The authors argue that the strategy to achieve a sustainable university is to follow the four steps of the spiral: policy-PLAN, operations-DO, evaluation-CHECK, and optimization-ACT and always pay attention to the elements involved: organization, statement, strategy, education, research, practice, quality control systems and report.
- Mader (2009) studied several universities in different regions of the world and consolidated, based on the integration of common elements he discovered, the model of integrative development processes towards sustainability in regions.
- The topic of the sustainable university was afterward approached to support other complex research subjects like university rankings throughout the lens of education, research, and environment as core elements of sustainable development (Lukman et al., 2009).
- A complex and relevant model which clearly defines the role, the framework, and the constituents of the sustainable university was designed by Kostoulas-Makrakis and Makrakis (2012). The model supports the development of the sustainable university-based on four key constituents: a) curriculum, teaching and learning; b)

research and development; c) institutional/administrative operations and d) partnerships and outreach across the three distinct dimensions of sustainable development, considered: 1) social and economic justice; 2) ecological integrity and 3) the well-being of all living systems on the planet through an integrative and cross-cutting manner

- Grecu and Ipina (2014) elaborated a graphic model of a sustainable university comprising elements and processes that interconnect multiple fields. The authors suggest a cycle of transformative processes towards the goal of sustainable universities, starting from 1. Leadership commitment, 2. Social network, 3. Participation, 4. Education and learning, 5. Research integration and 6. Performance management.
- SUEM is the Sustainable University Excellence Model, developed to comprise, link and set up together with the complexity of the topic in a sole picture (Hussain et al., 2019, p. 11). Built according to the design and logic of a navigation compass, the model integrates into a balanced approach, by including the following elements: teaching excellence, accessibility, community engagement, environment, research culture, technological capability building, internationalization.

Due to the complexity of the topic, more recent studies have adopted narrower and rather targeted research questions based on the concept of sustainable universities, such as universities as culture change agents for sustainable development; relevance and social responsibility of sustainable university; the role of sustainable university principles for corporate entrepreneurship; the resilient city adapting towards sustainable university mobility and more.

The importance of innovation strategies for the well-being of a sustainable university is explored and argued by Grabara et al. (2020) in strong connection with the highly valuable human resources and corporate entrepreneurship. The study revealed that there are strong positive determinations between the sustainable development of human resources and entrepreneurship on the results of sustainable innovation which further leads to the achievement of the sustainable university. Moreover, such an academic work environment carried out between universities, leads to the strengthening of the sustainable innovation process and facilitates the consolidation of the sustainable university (Salamzadeh et al., 2014).

4. 'Ștefan cel Mare' University as an open system

From the analysis of the relations that the University of Suceava establishes with the insertion environment through the exercise of the five functions - development of creative human capital, regional innovation, community development, participation in regional leadership, and economic influence, it is found that the higher education institution behaves as an open system that contributes to the development of its area of influence. The inputs generated by the local and regional insertion environment of the University's human, financial and material resources (Figure 1) are capitalized by the Higher Education Institution and transformed by specific mechanisms into outputs useful to the insertion environment.

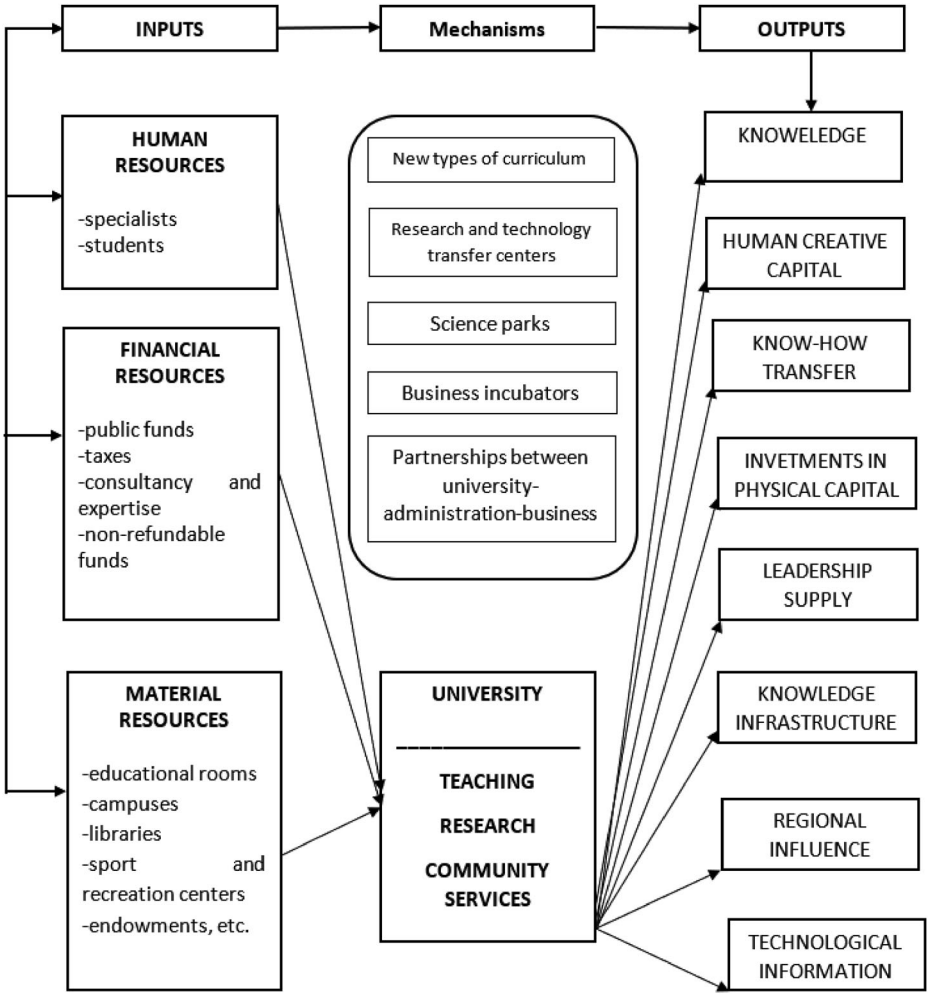

Figure 1. The university as an optimal open system.
Source: adaptation after (Dedita, 2015).

By exercising the functions aimed at the development of creative human capital, regional innovation, community development, and participation in regional leadership, the University generates several specific outputs (Figure 1). These outputs are directly monitored by the higher education institution, being the result of human capital formation, scientific research and innovation, and involvement in community development. In a subsidiary way, these university 'results' have an economic impact on the insertion environment of the University.

The financial university inputs 'return' in another manner in the insertion environment that generated them. A certain percentage returns to the local or regional economy in the form of salaries, scholarships or other forms of financial support offered to the employees or students. Also, another significant part of these financial resources is transferred to the business environment in the form of remuneration for the different services that contribute to the development of the material base and the infrastructure of the university campus (Filho, 2011).

Scientific research projects with non-refundable funding, in addition to the direct impact determined by the financial resources attracted to the insertion environment of the University, also determine a strong indirect impact. It is generated by the technological transfer and knowledge of the results of these projects, the impact they have on regional innovation, or the influence of human capital with a higher level of training and specialization determined by the participation in programs that considered the development of human resources. Also, the development of human resources through initial education or continuous training has an important economic impact on the labor insertion environment, generating besides the high-skilled workforce also sustainable effects like business location decisions in the influence of the higher education institution or the transfer of knowledge, skills, and abilities towards employers (de la Harpe & Thomas, 2009; Ionescu et al., 2022).

At this point, it is worth mentioning that since 2018 'Stefan cel Mare' University of Suceava has been number one in the national top for brevets and innovations as declared by the National Office of Brevets, Licences, and Inventions of Romania (Bejinaru et al., 2018).

5. Research methodology

5.1. Objectives

The general objective of the research is to identify the main factors of influence in terms of framing 'Stefan cel Mare' University in the pattern of the sustainable university from the students' perspective. In this approach, we shall identify the academic skills and competencies acquired by students, as key elements for the development of the university and the development of students' entrepreneurial abilities and skills as future entrepreneurs.

Correlating the key elements of the sustainable university identified in the literature review with the real coordinates identified at this Higher Education Institution we formulated in the scope of our research the following specific objectives:

1. Identification of competencies, skills, and knowledge that allow students to become aware of the concepts of sustainability and sustainable development from an economic, social, and ecological point of view;
2. Identification of curricular and extracurricular activities through which the university trains conscious and responsible graduates to be able to approach sustainable development correctly and actively;
3. Identifying initiatives to create a stimulating environment for inter-and multidisciplinary learning and research in the economic, social, and ecological fields;
4. Recognition, and involvement of students as valuable partners to promote the transition to the principles of sustainable development;
5. Creating interdisciplinary and systemic connections between disciplines to identify social, economic, and environmental relations in the analysis of various cases;
6. Assuming the role of leader of the university in preparing students and providing material and information resources for the consolidation of a sustainable society;

7. Achieving the interdisciplinary connection between entrepreneurship - ecological concerns and sustainability.

5.2. Research method and instrument

To this study participated a number of 348 students from 'Ştefan cel Mare' University of Suceava. From the total number, 258 respondents were female students and 90 were male students. The average age of the respondents who filled in the online questionnaire is 22.74 years. The first stage of the questionnaire analysis will consist of a CPA (Confirmatory Factor Analysis) and throughout the second stage, the factors obtained will be integrated into a linear regression equation to identify whether exists a combined influence of the studied variables.

5.3. Variables used in research

Corroborating the authors' perspectives and the conclusions of their studies found in the literature, we made an argumentation of the objectives formulated to ensure that there are solid foundations according to which they deserve to be investigated. Items were coded on a scale from 1 (very low degree) to 5 (very high degree) and participants were asked to indicate the extent to which they agreed/disagreed with the presented statements.

University skills and competencies. The 12 items refer to contents like the ability to practice in the graduated field, the knowledge of the graduated field of specialization, or the ability to coordinate activities in the field. Alpha Cronbach for the scale is 0.843.

Material resources. Two items were used that measure the material endowment within the Faculty of Economics, Administration and Business - FEAA Suceava. The items referred to the existing teaching facilities and materials within the faculty. Alpha Cronbach for the scale is 0.862.

Academic interaction. Four items were used to measure the interactions within FEAA Suceava. Participants were asked to indicate the extent to which they benefited from interactive conditions within the faculty programs. Alpha Cronbach for the scale is 0.884.

Interest in starting a business. Four items were used to measure the preference to open a business. Participants were asked to indicate the extent to which they would be interested in starting their own business. Alpha Cronbach for the scale is 0.892.

Desire to follow a pro-entrepreneurial project. One item was used to measure the interest of students to participate in a pro-entrepreneurial project. Respondents were asked to indicate the extent to which they would be interested in participating in a pro-entrepreneurial project. Alpha Cronbach for the scale is 0.891

External obstacles in the way of opening a business. Two items were used to measure the perspective upon external risks and obstacles. The participants were asked to indicate the extent to which they consider that the external environment is hostile and full of dangers and obstacles. Alpha Cronbach for the scale is 0.859.

Fear of failure. One item was used to measure respondents' fear of failure in response to the idea of opening a new business. Participants were asked to indicate the extent to which they would be afraid of failure if they opened a new business. Alpha Cronbach for the scale is 0.856.

Educational methods that develop entrepreneurial skills. Seven items were used to measure respondents' perception that certain educational methods develop entrepreneurial skills and abilities. Alpha Cronbach for the scale is 0.851.

6. Statistical interpretation of data

6.1. Interpretation of significance and consistency coefficients

To find out if there is a relationship between the main variables of the research, we performed a Pearson correlation analysis in SPSS. The correlation matrix is presented below in Table 1:

The Pearson correlation matrix indicates that there are large, medium and small size correlations between the variables under analysis. The variable fear of failure has a significant correlation with the variable university skills and competencies, and the value of p is 0.042. Even if the correlation is significant, the value close to the significance threshold requires replication of the link in other research conditions.

To verify the sample validity, we performed t tests for independent samples. For this we transformed the continuous variables into dichotomous variables (1 = low values, 2 = high values), depending on the median of the variables. The results indicated the following in Table 2, below:

The results indicated that all differences between the tested environments are statistically significant. The results indicated that the averages on the level of academic

Table 1. Correlation matrix between the main research variables.

	2. Material resources	3. Academic interaction	4. Interest in starting a business	5. Desire to follow a pro-entrepreneurial project	6. External obstacles in the way of opening a business	7. Fear of failure
1. University skills and competences	**,518**	**,653**	**,393**	**,402**	**,349**	**,109**
	,000	,000	,000	,000	,000	,042
	348	348	348	348	348	348
2. Material resources		**,719**	**,297**	**,280**	**,213**	*,047*
		,000	,000	,000	,000	*,382*
		348	348	348	348	*348*
3. Academic interaction			**,351**	**,341**	**,298**	*,055*
			,000	000	,000	*,304*
			348	348	348	*348*
4. Interest in starting a business				**,457**	**,586**	**,280**
				,000	,000	,000
				348	348	348
5. Desire to follow a pro-entrepreneurial project					**,373**	*,041*
					,000	*,440*
					348	*348*
6. External obstacles in the way of opening a business						**,452**
						,000
						348

Notes: (1) bold values are marked as significant correlations. (2) FEAA = Faculty of Economics, Administration and Business.
Source: elaborated by the authors.

Table 2. Correlation matrix for the main research variables.

Dependent Variable	Independent Variable	N	M	SD	t	p
1. Competencies and skills	Material resources (low)	204	39.99	6.76	−9.121	**.000**
	Material resources (high)	144	46.45	6.13		
2.Competencies and skills	Academic interaction (low)	223	39.92	6.47	−10.89	**.000**
	Academic interaction (high)	125	47.55	5.84		
3.Participate in a	Competences and skills (low)	183	3.72	1.05	−6.860	**.000**
pro-entrepreneurial project	Competences and skills (high)	165	4.39	.76		
4.Interest in starting a business	Competences and skills (low)	183	13.53	3.74	−5.514	**.000**
	Competences and skills (high)	165	15.64	3.34		
5.External obstacles in the way	Competences and skills (low)	183	21.25	4.08	−5.817	**.000**
of opening a business	Competences and skills (high)	165	23.89	4.37		
6.Fear of failure	Competences and skills (low)	183	3.47	1.07	−2.447	**.015**
	Competences and skills (high)	165	3.77	1.21		

Source: elaborated by the authors.

skills and abilities vary significantly depending on the educational methods that support the development of entrepreneurial skills. Specifically, the results indicated that there are differences between the averages of the following educational methods depending on the level of competencies and abilities:

- [Entrepreneurship courses] and [internships in companies] (Mdiff = -.241, Str. Err. = .066, p = .006)
- [Entrepreneurship courses] and [meetings with successful entrepreneurs] (Mdiff = -.235, Str. Err. = .066, p = .008)
- [Entrepreneurship courses] and [project involvement] (Mdiff = -.227, Str. Err. = .066, p = .013)
- [Stimulating business during the learning period] and [internships in companies] (Mdiff = -. 209, Str. Err. = .066, p = .029)
- [Stimulating business during the learning period] and [meetings with successful entrepreneurs] (Mdiff = -.204, Str. Err. = .066, p = .038)
- [Career guidance and counseling] and [internship in companies] (Mdiff = -. 201, Str. Err. = .066, p = .043).

6.2. Using the principal components analysis at the level of research variables

To synthesize the collected data, a factorial analysis was performed which allowed the identification of the most significant factors capable of describing the coordinates of the investigated population. The application of the analysis was done at the level of the categories of items delimited within the questionnaire, namely:

1. Questions related to students' perception of the educational process.
2. Questions related to students' perception of extracurricular activities.
3. Questions describing the individual and institutional effort to promote entrepreneurship.
4. Questions describing the ecological perspective of sustainability.

The analysis of the main component starts from the hypothesis that the whole variation is common, so the initial commonality is 1 for all factors. The values of

each factor are the variance explained by the linear composition. At the level of the main components identified, an analysis of the internal consistency of the measurement scale was performed, to test the reliability of all variables. This determined the internal coherence of the scale used. The test results always indicated values higher than 0.9, proving a good internal consistency.

6.2.1. Applying the analysis for the variables representing the students' perception of the educational process

The application of the Principal Components Analysis method led to the retention of 4 factors that explain a proportion of the variation of the answers of approximately 57%, as presented in Table 3 below.

Table 3. Rotated component matrix.

	Component			
	1	2	3	4
I.10. Ability to identify new opportunities and act quickly to pursue them	,773			
I.8. Ability to formulate new ideas and solutions	,724			
I.11. The ability to learn new things, to document and improve continuously	,712			
I.9. Ability to effectively manage working time	,659			
I.17. Knowledge of the field of study/specialization graduated	,657			
I.7. Ability to prepare reports, notes, or other documents	,655			
I.16. Creativity and innovation	,638			
I.13. Ability to practice in the specialty/field graduated	,606			
I.6. Ability to coordinate activities	,605			
I.12. Ability to work in a team	,507			
I.14. Communication skills in foreign languages		,722		
I.15. Digital competences		,704		
II.6. Students' ability to influence university policy and strategic decisions				,732
II.3. Provision of teaching materials (textbooks, laboratory/ project guidance, bibliographic documents)				,722
III.3. Participation in research projects				,713
III.4. Internships, internship placements				,673
II.5. Possibility to participate in internships				,661
II.4. The guidance provided by teaching staff (including for exam preparation)				,658
II.7. Theme and content of the disciplines studied				,636
III.1. Debates between students during the course / seminar / laboratory / project				,630
III.2. Learning through individual or group projects (other than research)				,596
II.2. Equipping with equipment and tools for practice / workshops / specialty classes / laboratories / seminars		,414	,407	,442
I.2. The program has a good academic reputation			,735	
I.4. The program is oriented towards professional training (for a specific occupation)			,713	
I.1. The skills offered by the program are known to most employers in the field.			,671	
I.5. The program is oriented towards the preparation of academic and specialized research			,635	
I.3. The program has a wide disciplinary orientation (allows to occupy a wide range of positions after graduation)			,574	
II.1. Teaching quality (method, technical means, teaching style)		,464	,483	

Source: elaborated by the authors.

The component matrix found by the Varimax rotation method indicates 4 principal components (PC) in which the variables aimed at the perception of the educational process are grouped:

PC1-Perception of acquiring new skills. The most important variable of the main component 1 refers to the perceived ability of students to identify new opportunities and to act quickly to pursue and capitalize on them. Also, it can be noticed the presence in the category of variables with significant influence on these main components and other variables that deal with perception, respectively, the respondents' desire to continuously improve and to be able to formulate new ideas and solutions.

PC2-Perception of necessary communication skills. One can notice a grouping of variables related to students' perception of communication skills in foreign languages and digital skills, correlated with the variable related to the endowment with equipment and tools necessary for practical activities, as resources used in teaching, around a new main component. This new main component indicates the orientation of students towards those skills currently needed for rapid integration into a global labor market.

PC3-Reputation of the program/field of study. From the internal analyses regarding the admission process of students to the study programs organized at the level of Ștefan cel Mare University of Suceava, it is known that the choice of the study program is a complex decision-making process, which is generally influenced by family and/or colleagues. The family generally relates to the reputation of the program in giving graduates the best chance of finding a job that ensures a high social status and colleagues relate to their own experience during their studies in that university program. Thus, we can notice a strong influence from the variables. The program has a good academic reputation and the Program is oriented towards professional training (for a specific occupation) on these main components identified.

PC4-Two-way communication student-university. One last main component identified groups of variables that indicate how students want to be involved in the academic and administrative activity of the higher education institution. The students want diversified coordination from the teachers regarding the resources and teaching methods used but also the possibility to have control over the decisions of the governing bodies of the university and which can also influence their activity.

6.2.2. Applying the analysis for the variables aimed at students' perception of extracurricular activities

The application of the Principal Components Analysis method led to the retention of 4 factors that explain a proportion of the variation of the answers of approximately 69%, presented in Table 4 below.

The component matrix found by the Varimax rotation method indicates 2 main components in which the variables aimed at the perception of extracurricular activities are grouped:

PC5-Extracurricular activities. Regarding this main identified component, we can notice a strong influence from the variables that describe the students' desire to get

Table 4. Rotated component matrix.

	Component	
	1	2
IV.2. Charitable actions	,841	
IV.3. Scientific actions	,819	
IV.5. Student research clubs	,802	
IV.4. Organizational actions / Organizing events at the university	,800	
IV.1. Social actions-Volunteering	,791	
IV.6. Student organizations	,762	
IV.8. Self-development		,869
IV.9. Interest in gaining experience		,869
IV.10. Development of skills already acquired		,823
IV.7. Improving your resume		,678
IV.11. Networking		,672

Source: elaborated by the authors.

involved in the life of the community and to contribute to the implementation of academic activities.

PC6-Motivational springs of extracurricular activities. The main motivating source for involvement in extracurricular activities seems to be the desire to self-develop and gain practical experience.

6.2.3. Applying the analysis for the variables that describe the individual and institutional effort to promote entrepreneurship

The application of the Principal Components Analysis method led to the retention of 6 factors that explain a proportion of the variation of the answers of approximately 60%, as presented in Table 5.

The component matrix found by the Varimax rotation method indicates 6 principal components that describe the individual and institutional effort to promote entrepreneurship:

PC7- Actions to promote entrepreneurship through a strengthened partnership between USV and the private sector. The perception of USV students is that closer collaboration is needed between the university and the private sector to allow a transfer of knowledge and, at the same time, ensure a sustainable and entrepreneurial university status.

PC8- Methods of acquiring knowledge in the field of entrepreneurship. Students consider that the most effective methods of acquiring entrepreneurial skills are internships, counselling, and career guidance activities, respectively, methods that combine participation in specialized courses and involvement in concrete projects.

PC9- Characterization of the entrepreneur profile. During the years of study, students were able to discover what are the main personality traits of entrepreneurs and the degree to which they overlap with individual personality traits.

PC10- Methods/tools to promote entrepreneurship among students. Among the most effective tools for promoting entrepreneurship among students are indicated the extracurricular actions that address this issue, respectively, various specific social media channels.

PC11- Business categories targeted by students. Among the business categories to which students focus, especially, are start-ups, businesses in the field of promoting

Table 5. Rotated component matrix.

	Component					
	1	2	3	4	5	6
V.25. Internships	,740					
V.23. Creating jobs for graduates	,716					
V.29. Smart specializations that correspond to the labor market	,690					
V.26. Public-private partnerships	,688					
V.24. Development of entrepreneurial skills through the curriculum	,685					
V.30. Business incubators	,673					
V.27. Knowledge transfer and innovation	,672					
V.28. Development of the North-East region	,652					
V.22. Attracting European funds through projects	,636					
V.31. Internationalization	,573					
V.35. Internship in companies		,665				
V.33. Career guidance and counseling sessions		,665				
V.34. Stimulating business during the learning period		,653				
V.42. Combined learning		,652				
V.38. Involvement in projects		,618				
V.37. Business plan competitions		,609				
V.32. Participation in entrepreneurship and learning material courses		,604				
V.36. Meetings with successful entrepreneurs		,590				
V.41. E-learning		,580				
V.43. Extracurricular learning		,544				
V.40. Formal learning		,471				
V.15. Creativity and innovation			,731			
V.17. Tenacity			,716			
V.19. Continuous learning			,692			
V.16. Passions for own ideas			,691			
V.20. Other skills and abilities			,684			
V.18. Trust			,649			
V.14. I have leadership skills			,643			
V.12. I'm proactive and I like to work.			,634			
V.11. I take responsibility for my work			,546			
V.13. I have risk tolerance.			,401			
V.5. Extracurricular actions				,772		
V.7. Promotion on social media / Facebook				,759		
V.6. Promotion from the press / radio / TV				,745		
V.4. The activity of student clubs				,743		
V.3. Collaboration protocols with companies and institutions				,688		
V.1. The disciplines studied				,607		
V.2. Non-reimbursable projects implemented				,553		
VI.5. Identifying solutions to common problems					,710	
VI.6. Identification of funding sources					,666	
VI.2. Start-up, business with growth potential					,650	
VI.8. Promotion of new products/services					,636	
VI.3. Lifestyle business					,623	
VI.1. Family business					,621	
VI.4. Other					,552	
VI.7. Bureaucratic aspects with the opening and operation of a company					,519	
V.21. To what extent would you be interested in participating in a pro-entrepreneurship project?					,405	
VI.10. Lack of entrepreneurial knowledge						,791
VI.9. Lack of entrepreneurial skills						,773
VI.11. Lack of own experience						,733

(*continued*)

Table 5. Continued.

	Component					
	1	2	3	4	5	6
VI.14. Uncertainty and turbulence continue in the business environment						,713
VI.13. Fear of failure						,647
VI.12. The complexity of the business environment						,639

Source: elaborated by the authors.

products and services. However, we can notice a strong correlation with this main component of two variables that indicate a series of fears about the entrepreneurial path, namely the lack of confidence that they can find solutions to common problems faced by an entrepreneur in the Romanian economy, respectively, identifying sources of funding.

PC12- The main fears of students about starting a business. Among the most important fears can be listed: lack of entrepreneurial knowledge, lack of entrepreneurial skills, lack of personal experience. Even if the fears indicated by students are generic, their identification allows the university to further investigate these directions indicated by students, so that it can respond through effective methods and tools to reduce/eliminate these fears.

6.2.4. Applying the analysis to the variables that describe the ecological perspective of sustainability

The application of the Principal Components Analysis method led to the retention of 4 factors that explain a proportion of the variation of the answers of approximately 60%, as presented in Table 6, below.

The component matrix found by the Varimax rotation method indicates 4 principal components in which the variables aimed at the perception of extracurricular activities are grouped:

PC13- Actions that in the opinion of students should be found in the concerns of a sustainable university. In the perception of students, among the concerns of a sustainable university, from an ecological perspective, should be found the identification of solutions to reduce pollution and its causes and protect nature by avoiding waste and encouraging sustainable social consumption.

PC14- Institutions/Organizations responsible for environmental protection. In the students' perception, the institution that should play a central role in environmental protection is the Government, which has both legislative and logistical levers to carry out such an activity. Civil organizations and civil society should be positioned alongside the Government.

PC15- Causes of environmental degradation. Some of the main causes identified by students for environmental degradation seem to be a lack of environmental education and indifference. Involvement in projects such as Greenest University,

Table 6. Rotated component matrix.

	Component			
	1	2	3	4
VII.2. Nature protection	,799			
VII.3. Reducing pollution and its causes	,798			
VII.6. Avoiding waste and encouraging sustainable social consumption	,742			
VII.4. Contemplation of nature	,741			
VII.1. Cleaning green spaces	,724			
VII.8. Through practice, outdoor activities, extracurricular activities	,718			
VII.5. Ensuring a clean environment	,668			
VII.9. Active involvement in the well-being of society as a whole	,647			
VII.11. I am interested in environmental protection; I try to behave responsibly towards the environment	,561			
VII.10. I'm interested in environmental protection	,558			
VII.16. Government		,789		
VII.18. Civil organizations		,740		
VII.19. Environmental authorities		,724		
VII.15. Hall		,721		
VII.17. Media-TV, radio, socket		,648		
VII.20. School / University		,626		
VII.21. Parents / family		,532		
VII.24. Lack of education			,751	
VII.25. Involvement in national projects such as Greenest University			,730	
VII.23. indifference			,716	
VII.26. Sustainable environmental reporting Greenest University Campuses			,705	
VII.27. Incorporating the concept of sustainable development in the university curriculum			,677	
VII.28. Properly designed and thought-out study programs			,661	
VII.22. Financial causes				,660
VII.7. Through theory, informative lessons, courses, seminars				,632
VII.12. I am interested in environmental protection; I talk about it regularly with family and friends				,613

Source: elaborated by the authors.

incorporating the concept of sustainable development into the university curriculum can be solutions to address these shortcomings.

PC16- Category of contemplative students. The analysis of the main components also led to the identification of a special category of students, namely those who say they are interested in environmental protection, talk regularly about it with family and friends, are interested in theory, informative lessons on environmental issues, but who see that the problem of environmental degradation has financial causes.

6.3. Statistical modelling of the influence of the studied variables on the students' perception regarding the status of USV as an entrepreneurial and sustainable university

To be able to measure the combined influence of the studied variables on the students' perception regarding the status of USV as an entrepreneurial and sustainable university, respectively, to identify the factors with major/significant influence, we used the logistic regression method.

Table 7. Model summary.

1	407,915	,144	,195
2	372,129	,229	,310
3	345,191	,288	,389
4	332,201	,315	,424
5	325,717	,328	,442
6	320,001	,339	,457
7	315,393	,348	,469
8	310,930	,356	,480
9	306,576	,364	,491

Source: elaborated by the authors.

Table 8. Variables in the equation.

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 9	PC13	,573	,151	14,490	1	,000	1,774
	PC14	,352	,145	5,905	1	,015	1,422
	PC15	,782	,158	24,375	1	,000	2,186
	PC16	-,325	,151	4,612	1	,032	,722
	PC5	,630	,155	16,449	1	,000	1,878
	PC6	,880	,168	27,577	1	,000	2,412
	PC1	,339	,147	5,301	1	,021	1,404
	PC3	,300	,144	4,341	1	,037	1,350
	PC4	-,309	,153	4,081	1	,043	,734
	Constant	,493	,144	11,757	1	,001	1,637

Source: elaborated by the authors.

For this, we used as a dependent variable the variable 'Do you consider that the university you study in is an entrepreneurial and sustainable university?', measured on a dichotomous room (0 = No, 1 = Yes) and as factorial/predictive variables we used the scores of the principal components from PC1 to PC16 obtained in the previous stage.

The refinement of the factorial variables was performed by testing the significance of the coefficients using the likelihood-ratio test (LR). The LR test is recommended when building the model step by step, checking if the variable removed from the model is significant so that the model can be simplified (Table 7).

From the analysis of the Nagelkerke R Square indicator, it can be specified that the last model retained manages to explain about 50% of the variation of the dependent variable, which contains the following predictive variables (Table 8): (PC13), (PC14), (PC15), (PC16), (PC5), (PC6), (PC1), (PC3), and (PC4).

From the analysis of the coefficients related to the model with predictors it can be observed that we find only variables with a statistically significant influence, which lead to the following logistic regression equation (1):

$$\begin{aligned}\log(p/1-p) = {} & 0.493 + 0.573 * (PC13) + 0.352 * (PC14) \\ & + 0.782 * (PC15) - 0.325 * (PC16) + 0.630 * (PC5) \\ & + 0.880 * (PC6) + 0.339 * (PC1) + 0.300 * (PC3) \\ & - 0.309 * (PC4) \end{aligned} \quad (1)$$

From the analysis we can select the first three factors, with the most important influence on students' perception, which are:

- PC 15 - Causes of environmental degradation,
- PC 5 - Extracurricular activities,
- PC 6 - Motivational springs of extracurricular activities.

Thus, it can be concluded that better awareness of the causes of environmental degradation among teaching staff and by carrying out joint projects with students, as part of extracurricular activities, can bring an improvement in students' perception of the efforts that the host university undertakes towards the goal of achieving the entrepreneurial and sustainable university.

7. Conclusions and limits of research

This research aimed to test how students' competencies and abilities vary according to a set of variables depending on a series of other factors interacting with the academic environment.

First, the results indicated that a high degree of material resources available to be used by students is associated with a high level of academic skills and abilities. This indicates that material and didactic endowments facilitate academic performance and the development of skills and abilities required by the labor market and national and international educational goals.

Second, statistical analyses showed that respondents who record higher interactions related to the university context gain higher university skills and competencies. This means that academic interactions and academic flexibility, through the involvement of students in the teaching-learning process or the decision-making process, is an element that facilitates the acquisition of the same academic competencies and abilities.

Third, the statistical results indicated that when the competencies and skills acquired in the university are higher, students report a significantly higher degree of interest in opening a new business as well as for further qualification improvement by participating in pro-entrepreneurial projects. The motivation streams out of self-confidence about the skills and abilities acquired at university.

Fourth, our data have shown that as skills and abilities increase, so does the acknowledged fear of failure as well as the perception of the individual's external obstacles to starting a business. This means that no matter how high the students' skills and abilities are, they cannot dispel the fear of external obstacles that transform into uncertainties and ongoing turmoil in the business environment, lack of funding, or bureaucratic issues regarding the opening and operation of a company.

Finally, the analysis shows that some educational methods do not differ statistically from each other, namely: participation in entrepreneurship courses and learning materials, career guidance and counseling sessions, plan business competitions. Also, there are no significant differences in environments between the methods: an internship in companies, meetings with successful entrepreneurs, and business plan competitions. These latter methods obtained the highest score on the variable academic skills and abilities. In addition, in the case of methods from the two categories, there are most statistical differences. A possible explanation for the high score of the three

variables in academic competencies and abilities is given by the practical value of the method. Practicing in companies as well as involvement in projects, or meeting successful entrepreneurs, means increasing entrepreneurial motivation as well as gaining experience in the field. The other methods that scored less refer rather to the theoretical lessons and business preparation part.

The limits of this research are: (1) the data were self-reported by the respondents and it raises the issue of subjectivity and facade tendency, (2) the research had unequal groups of participants, and (3) the data was collected and analyzed only for respondents from University of Suceava. However, the results are confirmed by national and international studies, through the publications cited above.

Disclosure statement

No potential conflict of interest was reported by the authors.

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References

Baldini, N., Fini, R., Grimaldi, R., & Sobrero, M. (2014). Organisational change and the institutionalisation of university patenting activity in Italy. *Minerva*, *52*(1), 27–53. https://doi.org/10.1007/s11024-013-9243-9

Bejinaru, R. (2017). Dynamic capabilities of universities in the knowledge economy. *Management Dynamics in the Knowledge Economy*, *5*(4), 577–595. https://doi.org/10.25019/MDKE/5.4.07

Bejinaru, R. (2018). Assessing students' entrepreneurial skills needed in the knowledge economy, *Management & Marketing, Challenges for the Knowledge Society*, *13*(3), 1119–1132.

Bejinaru, R., Hapenciuc, C. V., Condratov, I., & Stanciu, P. (2018). The university role in developing the human capital for a sustainable bioeconomy. *Amfiteatru Economic*, *20*(49), 583–598. https://doi.org/10.24818/EA/2018/49/583

Betáková, J., Havierniková, K., Okręglicka, M., Mynarzova, M., & Magda, R. (2020). The role of universities in supporting entrepreneurial intentions of students toward sustainable entrepreneurship. *Entrepreneurship and Sustainability Issues*, *8*(1), 573–589. https://doi.org/10.9770/jesi.2020.8.1(40)

Bolisani, E., & Bratianu, C. (2018). The emergence of knowledge management. In E. Bolisani & C. Bratianu (Eds.), *Emergent knowledge strategies: Strategic thinking in knowledge management* (pp 23–47). Springer International Publishing. https://doi.org/10.1007/978-3-319-60657-6_2

Bratianu, C., Prelipcean, G., & Bejinaru, R. (2020). Exploring the latent variables which support SMEs to become learning organizations. *Management & Marketing. Challenges for the Knowledge Society*, *15*(2), 154–171. https://doi.org/10.2478/mmcks-2020-0010

de la Harpe, B., & Thomas, I. (2009). Curriculum change in universities: Conditions that facilitate education for sustainable development. *Journal of Education for Sustainable Development*, *3*(1), 75–85. https://doi.org/10.1177/097340820900300115

Dedita, I. (2015). *Rolul universității în creșterea capacității orașului Suceava de structurare a spațiului* [Doctoral thesis]. Bucharest University.

Etzkowitz, H. (2003). Research groups as 'quasi-firms': The invention of the entrepreneurial university. *Research Policy*, *32*(1), 109–121. https://doi.org/10.1016/S0048-7333(02)00009-4

Etzkowitz, H., Webster, A., Gebhardt, C., & Terra, B. (2000). The future of the university and the university of the future: Evolution of ivory tower to entrepreneurial paradigm. *Research Policy*, *29*(2), 313–330. https://doi.org/10.1016/S0048-7333(99)00069-4

Fayolle, A., & Redford, D. (2014). Introduction: Towards more entrepreneurial universities - myth or reality. ? In A. Fayolle & D. Redford (Eds.), *Handbook on the entrepreneurial university* (pp. 1–10). Edward Elgar.

Filho, W. (2011). About the role of universities and their contribution to sustainable development. *Higher Education Policy*, *24*(4), 427–438. https://doi.org/10.1057/hep.2011.16

Gibb, A. A. (2012). Exploring the synergistic potential in entrepreneurial university development: Towards the building of a strategic framework. *Annals of Innovation & Entrepreneurship*, *3*(1), 16742. https://doi.org/10.3402/aie.v3i0.17211

Grabara, J., Hussain, H. I., & Szajt, M. (2020). Sustainable university development through sustainable human resources and corporate entrepreneurship: The role of sustainable innovation and work environment. *www.amfiteatrueconomic.ro*, *22*(54), 480–495. https://doi.org/10.24818/EA/2020/54/480

Grecu, V., & Ipina, N. (2014). The sustainable university – a model for the sustainable organization. *Management of Sustainable Development*, *6*(2), 15–24. https://doi.org/10.1515/msd-2015-0002

Hapenciuc, C. V., Bejinaru, R., Roman, C., & Neamtu, D. M. (2016, July 4–6). *The role of hes within the evolution of the business sector* [Paper presentation]. EDULEARN- 8th Annual International Conference on Education and New Learning Technologies, Barcelona, Spain (pp. 5309–5317).

Hussain, T., Eskildsen, J., Edgeman, R., Ismail, M., Shoukry, A. M., & Gani, S. (2019). Imperatives of sustainable university excellence: A conceptual framework. *Sustainability*, *11*(19), 5242. https://doi.org/10.3390/su11195242

Ionescu, R. V., Zlati, M. L., Antohi, V. M., Stanciu, S., Burciu, A., & Kicsi, R. (2022). Supporting the tourism management decisions under the pandemic's impact. A new working instrument. *Economic Research-Ekonomska Istraživanja*, 1–33. https://doi.org/10.1080/1331677X.2022.2053361

Kostoulas-Makrakis, N., & Makrakis, V. (2012). Processes, strategies and practices for turning the University of Crete into a sustainable university. *Discourse and Communication for Sustainable Education*, *3*(1), 5–22. https://doi.org/10.2478/v10230-012-0001-2

Lozano, R., Lukman, R., Lozano, F. J., Huisingh, D., & Lambrechts, W. (2013). Declarations for sustainability in higher education: Becoming better leaders, through addressing the university system. *Journal of Cleaner Production*, *48*, 10–19. https://doi.org/10.1016/j.jclepro.2011.10.006

Lukman, R. K., & Glavic, P. (2007). What are the key elements of a sustainable university? *Clean Technologies and Environmental Policy*, *9*(2), 103–114. https://doi.org/10.1007/s10098-006-0070-7

Lukman, R. K., Krajnc, D. & Glavic, P. (2009). University ranking using research, educational and environmental indicators. *Journal of Cleaner Production*, *18*(7), 619–628. https://doi.org/10.1016/j.jclepro.2009.09.015

Mader, C. (2009). *Principles for integrative development process towards sustainability in regions: Cases Assessed from Egypt, Sweden and the USA* [Doctoral dissertation]. University of Graz, 140 p.

Neamtu, D. M. (2017, March 6–8). *The university – an entrepreneurial and innovative higher education institution* [Paper presentation]. 11th International Technology, Education and Development Conference, INTED 2017 Proceedings, Valencia, Spain. https://doi.org/10.21125/inted.2017.2088

Omer, W., & Aljaaidi, K. (2020). The association of entrepreneurial education and support with entrepreneurial intention at Northern Boarder University: The case of students from College of Business Administration. *Entrepreneurship and Sustainability Issues*, *8*(1), 555–572. https://doi.org/10.9770/jesi.2020.8.1(39)

Salamzadeh, A., Azimi, M. A., & Kirby, D. A. (2013). Social entrepreneurship education in higher education: Insights from a developing country. *International Journal of Entrepreneurship and Small Business*, *20*(1), 17–34. https://doi.org/10.1504/IJESB.2013.055691

Salamzadeh, A., Farjadian, A. A., Amirabadi, M., & Modarresi, M. (2014). Entrepreneurial characteristics: Insights from undergraduate students in Iran. *International Journal of Entrepreneurship and Small Business*, *21*(2), 165–182. https://doi.org/10.1504/IJESB.2014.059471

Stam, E. (2015). Entrepreneurial ecosystems and regional policy: A sympathetic critique. *European Planning Studies*, *23*(9), 1759–1769. https://doi.org/10.1080/09654313.2015.1061484

Sylvestre, P., McNeil, R., & Wright, T. (2013). From Talloires to Turin: A critical discourse analysis of declarations for sustainability in higher education. *Sustainability*, *5*(4), 1356–1371. https://doi.org/10.3390/su5041356

The Talloires Declaration (1990). http://ulsf.org/talloires-declaration/

Ualzhanova, A., Zakirova, D., Tolymbek, A., Hernández García de Velazco, J. J., & Chumaceiro Hernández, A. C. (2020). Innovative-entrepreneurial universities in the post-modern world concept: Possibilities of implementation. *Entrepreneurship and Sustainability Issues*, *8*(1), 194–202. https://doi.org/10.9770/jesi.2020.8.1(12)

Velazquez, L., Munguia, N., Platt, A., & Taddei, J. (2006). Sustainable university: What can be the matter? *Journal of Cleaner Production*, *14*(9–11), 810–819. 11https://doi.org/10.1016/j.jclepro.2005.12.008

Wright, T. (2004). The evolution of sustainability declarations in higher education. In P. B. Corcoran, & A. E. J. Wals (eds.), *Higher education and the challenge of sustainability* (pp. 7–19). Dordrecht: Springer. https://doi.org/10.1007/0-306-48515-X_2