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The effect of cooperation between universities and stakeholders: Evidence from Ukraine

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A B S T R A C T

This paper presents a scheme of implementation of the protocol for diagnosing stakeholders of educational space, which aims to meet the needs and interests of both contractors and the university, and makes an efficiency assessment in achieving the goals of the university. The ranking of the social status of the stakeholders in the association is obtained, which demonstrates the importance of each stakeholder in the collaboration. The relationships between university and stakeholders, the degree of communication of stakeholders with each other, the attitude of each stakeholder towards the group of stakeholders as a whole and the total activity of group interaction based on the calculation of sociometric indicators are determined. Finally, the effectiveness of the level of involvement of stakeholders in the activities of the University is also proved.

1. Introduction

Collaboration is a key factor in universities' interactions with various counterparties. The level of effectiveness of both the university and the stakeholder depends on their cooperation. That is why it is necessary to diagnose the effectiveness of collaboration between the university and the stakeholder and between the stakeholders themselves. Therefore, exploring the priority of collaboration with a particular stakeholder is an urgent scientific task, the accomplishment of which will allow universities to operate more efficiently and purposefully.

2. Literature review

The process of university activity is accompanied by cooperation with various counterparties. The level of effectiveness of both universities and stakeholder activities depends on their cooperation. That is why it is necessary to diagnose the environment and its representatives in order to counteract the negative impact and enhance the positive effect of the interaction. Studying the priority of cooperation with a particular stakeholder is an urgent scientific task, the solution of which will allow all participants of the

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educational process to work more qualitatively and effectively (Kovalska, 2011). Schneider-Störmann et al. (2020) presented two studies of the industrial impact on student education in Germany and France as a benchmark for a new approach to academic cooperation between universities in Finland. They proved that stakeholders need the knowledge and commercial competencies to do their jobs well. Szücs (2018) paid particular attention to partnerships between industries and universities and found that the benefits of working with universities were enhanced by their academic quality. Ankrah and AL-Tabbaa (2015) argue that collaboration between universities and industry is increasingly seen as a means of enhancing innovation through knowledge sharing. Acworth (2008), in his work, suggested that universities cooperate with the stakeholders, but that feedback should always be present during this interaction. Plewa et al. (2013) argued that communication, understanding, trust, and people are universal drivers, but managers need to consider changes in the nature of these factors in order to ensure successful communication. Galan-Muros and Davey (2019) talked about bilateral relationship between universities and business and argue in their work that this collaboration is currently fragmentary. Leonchuk and Gray (2019) and Ievdokymov et al. (2020) explored the understanding of outcomes and results of science, technology and innovation through human capital, using a rare quasi-experimental method in two ways: traditional and non-center learning. Belyaeva and Belyaev (2019) conducted a study of the behavior of stakeholders at universities in Russia and China and identified a number of factors that influence the functioning of interaction between Russian and Chinese student structure: geopolitical situation, cost and quality of education, adaptation of courses for international students, comfort of the university's learning environment, the complexity of learning the language of the host country, the prestige of education. When it comes to Malaysian universities (Tajuddin et al., 2013), much emphasis is placed on academic advising and the formation of student's personality. Asian universities also attach great importance to academic counseling – a valuable academic service and an important component of higher education. This service is very important for student satisfaction, retention, recruitment and success (Van Nguyen et al., 2013). Immerstein et al. (2019) argued that in order to bring higher education to the future, it is important to develop models and methods for preparing students for working life. Zhao et al. (2019) in their study discuss contemporary problems of international education in China. In the next decade, China is expected to become the most significant area of education for foreigners. As information technology is a leading industry in China, IT-related scholars are sure to attract a large number of international students. Wen et al (2019) examined the influx of international students into China in recent years and relevant internationalization strategies in the higher education sector and found that major problems for international students were poor command of English, poor student-teacher interaction on campus, and difficulties in social and cultural adaptation. Brown et al. (2018) compared the academic virtue of national and international occupational therapy students in their work and identified possible adherents of student involvement in dishonest academic behavior. Aldrich and Grajo (2017) argued that to achieve effective collaboration between students and universities, there must be a high level of critical student awareness. Kinash et al. (2019) proposed to establish university-stakeholder collaboration through education and production cluster of public-private partnership. Andrusiv et al. (2020) argued that it is possible to improve the current situation by creating favorable conditions for the generation and implementation of business ideas through the integration of science and production. With regard to Ukrainian universities, we have only now begun to work on establishing cooperation between the universities and the stakeholders (students) of the educational process. The aim of the article is to investigate the interaction of stakeholders in educational space and universities of Ukraine.

3. Results

Implementation of the educational space Stakeholder Diagnostics Protocol, which is aimed at meeting the needs and interests of both external contractors and the university itself, will ensure effectiveness in achieving the goals of the university. However, the needs of external contractors and the university have the potential to change, so the proper monitoring and forecasting of the effectiveness of stakeholder collaboration with universities is an integral component. Express evaluation, its analysis and implementation of cooperation measures should be systemic. On the basis of the conducted research it is

proposed to establish a frequency of surveys – 6 months (this period is empirically confirmed in practice as optimal), if circumstances do not require to conduct it earlier. Thus, the protocol for diagnosing stakeholders in the educational space will function continuously and cyclically (Fig. 1). Each successive cycle is an activity that replicates the previous one, but has new content to identify new needs of external contractors and the university and develop new measures to meet them.
It should also be noted that such a system of diagnosing stakeholders in the educational space should be accompanied by the achievement of the goals of the university, that is to be purposeful.

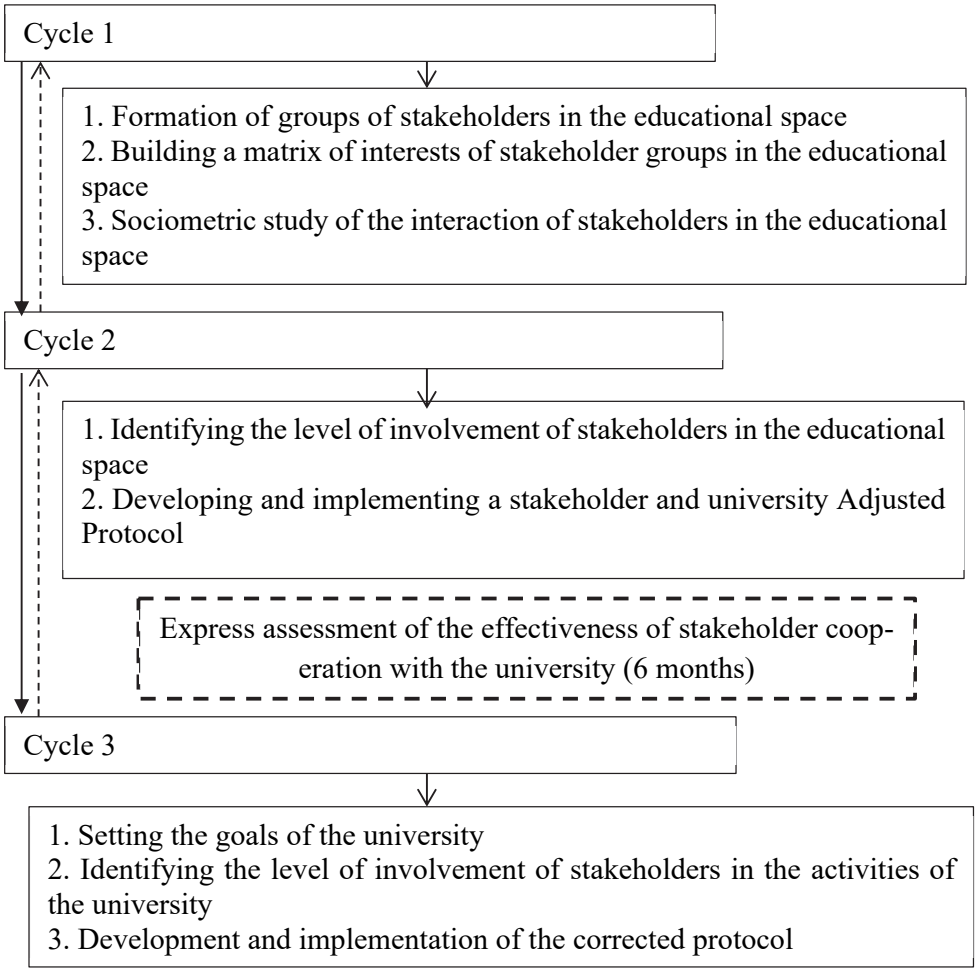

Fig. 1. Scheme of implementation of the protocol for diagnosing stakeholders of educational space
* Formed by the authors on the basis of Popadynets (2019)

Achieving the goals and cooperation of stakeholders with universities are two essential components of the protocol for diagnosing educational stakeholders. Thus, if we continue to repeat (every six months) the diagnosis of external contractors and the university, we will be able to establish their effective cooperation related to the satisfaction of their changing interests, which stimulates the continuous interest of managers in achieving high results.

It is advisable to begin the educational space with an assessment of the level of involvement of stakeholders in the educational space, for this purpose we propose a methodology for self-diagnosis of stakeholders and the university, which is presented in Table 1.

Table 1

Level of involvement of stakeholders in educational activities

№	Self-diagnosis questions of educational space stakeholders	Stakeholder1	Stakeholder2	….	Stakeholder n
		+/-	+/-		+/-
1.	Is a dialogue with the stakeholder part of the university's corporate culture?				
2.	Do the stakeholders have access to information about the university and its activities?				
3.	Do the stakeholders have access to the data on the person responsible for the relations with stakeholder?				
4.	Is the stakeholder matrix created: basic stakeholder needs and interests?				
5.	Is the stakeholder involvement policy developed?				
6.	Are there any methods for checking the effectiveness of collaboration with a stakeholder?				
7.	Do stakeholders understand how the decision-making process takes place?				
8.	Are stakeholders involved in the project development phase?				
9.	Are meetings with stakeholder documented?				
10.	Is a stakeholder consultation available?				
11.	Are the stakeholders informed about the implementation of the university's social responsibility?				
12.	Is honest information always available at the stakeholder's request?				
13.	Is there a mechanism for applying to the university for a disapproval of the project?				
14.	Are the deadlines for reporting to stakeholders settled?				
15.	Is the involved stakeholder monitored and evaluated?				

* adapted by the authors

The above method is easy to use, since evaluating each university stakeholder we put a "+" if the answer is positive and "-" if the answer is negative, which allows us to quickly recognize what components of cooperation are performed at a high level, and where it is necessary to make adjustments.

Stakeholder involvement in the educational space is graded as follows: 16-11 points – a stakeholder who considers him/herself involved in educational space activities to a great extent; 10-5 points – a stakeholder who considers him/ herself involved in educational space at an medium level; 4-0 points – a stakeholder who finds him/herself at least involved in the educational space.

The self-diagnosis methodology of the level of stakeholder involvement in the activities of the university also allows to identify weaknesses in cooperation with stakeholders, as any cooperation should be effective for both parties. In order to assess the effectiveness of the stakeholders, it is proposed to set out a set of conditions. Such a set of conditions is proposed in the form of express assessment (Table 2).

Table 2

Express assessmentof the effectiveness of stakeholder collaboration with the university

Question	Stakeholder 1 +/-	Stakeholder 2 +/-	….	Stakeholder n +/-
Obligatory conditions				
Is an expected collaboration efficiency greater than zero?				
Is the cost per unit of university collaboration lower than the cost per unit of stakeholder collaboration planned?				
Does the collaborative stakeholder provide sufficient demand for services to shape the effectiveness of the university?				
At what stage of development is cooperation and is there enough time to establish cooperation before its termination?				
Desirable conditions				
Expected performance from an activity with stakeholder is greater than incremental transaction costs when setting up collaboration				
The rate of return on investment of a university is higher than the rate of return of a stakeholder				
The cost of interaction with institutional agents is lower than in the domestic education market				

* adapted by the authors based on (Kovalska, 2011).

There are two sets of conditions in the express assessment of a university's stakeholder performance: compulsory and desirable. Each condition in these two groups is evaluated linearly on a dichotomous scale - "+" or "-". Express assessment reflects the fundamental profitability of the local market for the university in the event of its entry into it, or the absence of such profitability. It is advisable to use an expert team to evaluate the effectiveness of the stakeholder collaboration with the university, which will allow for the most objective express-evaluation. Let us outline the characteristics that an expert must possess to perform his or her duties effectively. We use the method of building an expert profile, the necessary characteristics are given in Table 3.

Table 3

Expert profile table

№	Constituents of the expert's potential	Possible indices (manifestation levels)			Optimal parameters of the expert
		low	medium	high	
1	Intelligence (IQ) in points	60-80	90-120	over 120	not less than 110
2	The level of mental development (PPP) in points	over 60	60-110	over 110	110-119
3	Creativity in points	over 6	6-14	15-20	over 14
4	Creativity (verbal test) in points	1-4	5-7	8-9	over 6
5	Total aggressiveness in %	0-25	25-55	55 and more	25-50
6	Hostility index in%	0-25	25-55	55 and more	20-30
7	Assertiveness in points	0-40	50-70	70	50-70
8	Method of conflict resolution	Competition, adaptation	compromise, evasion	cooperation	collaboration
9	Locus of control, total (Igen) in points	0-11	12-32	33-44	More than 33
10	Orientation vector	self-oriented	to communication and interaction	to process and result	to process and result
11	Psychological status	the one who is not given preference	the one given preference	leader	leader
12	Communicability in %	0-40	40-70	over 70	40 and more
13	Communication and management style	authoritarian	liberal-democratic	democratic	democratic
14	Organizational skills in%	0-40	40-70	over 70	50 and more

* adapted by the authors based on (Popadynets, 2018)

We detail the components of the expert's potential:

- *Orientation vectors*: attitude towards other people as members of the team, attitude towards work and its results, attitude towards oneself. Accordingly, it is possible to single out the following foci: the focus on communication and interaction (C), work orientation and its effectiveness (D), the focus on recognizing his/her achievements (I);
- *The level of mental development* – the level of creative, analytical and cognitive capabilities of the manager, embodied in the ability to freely use knowledge, skills, experience, acquiring new knowledge and skills. To characterize it in foreign and domestic practice, the coefficient of intelligence is used;
- *Creativity* – the use of creative capabilities of the manager in making unusual and unexpected decisions, commitment to new ideas, breaking the established stereotypes that point to the ability to quickly find a way out and make decisions in unusual situations;
- *The level of aggressiveness* is identified as an increased activity, not caused by external factors, but by the desire to dominate, link and resolve disputes by coercive methods;
- *Level of subjective control (locus of control* – a way of concentrating attention and mobilizing the experience of action in various situations of life, which is suitable for use in management activities. There are external and internal types of localization of event control;
- *Communicability* – tendency and ability to communicate with other people, kindness;
- *Assertiveness* (confidence in oneself) – shows the ability to formulate and express the desires, tasks, goals, requirements and to organize the process of their fulfilment;
- *Self-esteem* - assessmentby the manager of one's own abilities, actions and role in the team and society;
- *Extroversion and introversion* characterize the type of terperation by the innate features of the individual's nervous system, which influences the content of managers' incentives and motivators. Extroverts are characterized by sociability, active participation in collective activities, democratic views, riskiness and impulsiveness in decision-making, recklessness and actions at the first instigation. Introverts do not actively succumb to stimulation, because in decisions and actions they rely on their own vision and experience, so they are balanced and calm, restrained, closed, focused on their own problems;
- *anxiety and self-confidence* are characterized by a level of anxiety that reflects a manager's tendency to respond emotionally to threats and crisis manifestations of different nature, the possibility and need for psychocorrection to relieve tension or relaxation;
- *psychological status* is determined by the place of the manager in the team, which determines his functions, rights, privileges and responsibilities;
- *style of communication and management* is characterized by a relatively stable system of tools, methods and techniques of communication between the manager and the team, designed to perform management functions under certain conditions of operation of the enterprise or its structural unit. The main leadership styles include: authoritarian, democratic and liberal;
- *organizational skills* are shown in the ability to influence people, quickly find the optimal way out of difficult situations, initiativity, responsibility for decisions and actions.

Next, we will conduct sociometric studies, because sociometry enables us to see the structure of relations between stakeholders, to make assumptions about the stakeholder- leader, the degree of self-discipline of stakeholders. We group the obtained data from socio-matrices and use the obtained results to calculate the indicators: individual sociometric index; individual expansiveness index; group expansiveness index; stakeholder group reciprocity index (Popadynets, 2019).

Individual index of stakeholder's sociometric status C_i:

$$C_i = \frac{\sum_{i=1}^{n}(R_i^+ + R_i^-)}{N-1}, \quad (1)$$

where, $R_i^+ iR_i^-$ - the number of positive and negative ratings (votes) received, respectively; N – the number of stakeholders. Individual expansiveness index of stakeholder Ej :

$$E_j = \frac{\sum_{i=1}^{n}(R_j^+ + R_j^-)}{N-1}, \quad (2)$$

where, $R_j^+ iR_j^-$ - the number of negative and positive evaluations respectively.

Index Ej - characterizes the degree of stakeholder communication and reflects the attitude of each stakeholder to cooperation as a whole.

In addition to individual sociometric indices, group indices are also calculated.

Stakeholder group expansion index E:

$$E = \frac{R^{|+|} + R^{|-|}}{N(N-1)}, \quad (3)$$

where, $R^{|+|}$ і $R^{|-|}$ - total number of negative and positive evaluations respectively.

Index E characterizes the overall activity of stakeholders, expresses its dynamics. The closer it gets to the unit, the more intense the social activity of the stakeholders.

Index of group reciprocity of stakeholders C:

$$C = \frac{R^{|+|}}{N(N-1)}. \quad (4)$$

Index *C* expresses the relationship of stakeholders, their cohesion, close communication.

Stakeholder group integration index I:

$$I = \frac{N - |N|}{N} \quad (5)$$

$|N|$ - the number of stakeholders who have not received or made any assessment.

The next step is to identify the level of involvement of stakeholders in the educational space. Twelve stakeholders were selected for the study. To simplify the processing of socio-matrix data and for the privacy reasons the stakeholders are encrypted: in this case, a certain letter corresponds to each of them (Table 4).

Table 4

The level of involvement of stakeholders in the educational space

№	Self-diagnosis questions for educational space stakeholders	Result	Level of involvement
		+/-	
1.	Stakeholder A	10/6	medium
2.	Stakeholder B	12/4	high
3.	Stakeholder C	15/1	high
4.	Stakeholder D	10/6	medium
5.	Stakeholder E	14/2	high
6.	Stakeholder F	3/13	low
7.	Stakeholder G	15/1	high
8.	Stakeholder H	1/15	low
9.	Stakeholder I	2/14	low
10.	Stakeholder J	8/8	medium
11.	Stakeholder K	12/4	high
12.	Stakeholder L	16/0	high

The assessment of the level of involvement of stakeholders in the educational space shows the following results: B, C, E, G, K та L – stakeholders who consider themselves involved in educational activities at high level; A, D, J – stakeholders who consider themselves involved in educational activities at medium level; F, H та I – stakeholders who consider themselves involved in educational activities at low level.
Next, we form expert groups. It is advisable to use an expert team to evaluate the effectiveness of the stakeholder collaboration with the university, which will allow for the most objective express assessment. The experts were the leading specialists of the administrative staff of the university, namely:

- expert 1 - leading specialist in scientific work;
- expert 2 - leading specialist in research;
- expert 3 - leading specialist in scientific and pedagogical work;
- expert 4 - leading trade union specialist;
- expert 5 - leading specialist in socio-economic development.

For informational support and construction of the expert profile we recommend to use the data grouped in Table 5.

Table 5
Educational space expert profile

The main indicators	Ideal options	Experts				
		1	2	3	4	5
Intelligence	3	2	2	2.3	2.1	2
Creativity	3	2.33	1	1.4	1.5	2.4
Non-aggressiveness	3	1.67	1.67	1.67	1.67	1.67
Absence of conflict	3	2	2	2.1	1.4	2
Sociability	3	2.67	3	2.88	2.5	2.66
Orientation vector	3	2	1.67	2	1.67	1.3
Organizational skills	3	3	2.33	2.5	2.67	2.9

* formed by the authors based on their own research

We visualize the results in the Fig. 2.

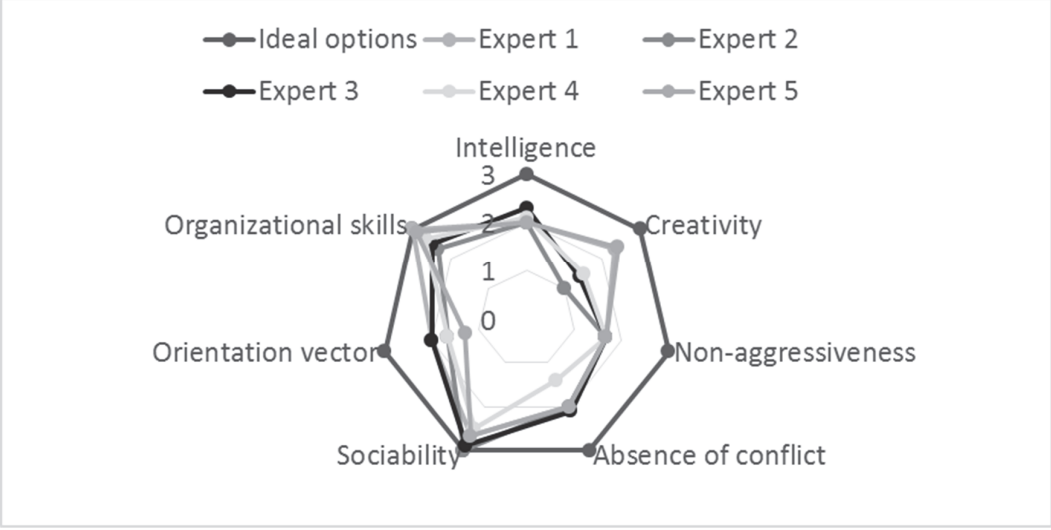

Fig. 2. Expert profile versus ideal parameters

* formed by the authors based on their own research

The main indicators of a high level of the expert's potential include: organizational and communicative abilities, partly absence of conflict, average level of intelligence, leadership, vector orientation and absence of conflict level, and low level of creativity and non-aggressiveness.

Let us conduct an express assessment of the effectiveness of stakeholder collaboration with the university (Table 6).

Table 6
Express assessmentof the effectiveness of stakeholder collaboration with the university

№	Issues of Stakeholder Collaboration with the University Effectiveness	Result +/-	Result %	Collaboration level
1.	Stakeholder A	4	57	moderate effectiveness
2.	Stakeholder B	4	57	moderate effectiveness
3.	Stakeholder C	7	100	Effective
4.	Stakeholder D	5	71	moderate effectiveness
5.	Stakeholder E	6	86	Effective
6.	Stakeholder F	4	57	moderate effectiveness
7.	Stakeholder G	7	100	Effective
8.	Stakeholder H	5	71	moderate effectiveness
9.	Stakeholder I	3	42	moderate effectiveness
10.	Stakeholder J	6	86	Effective
11.	Stakeholder K	6	86	Effective
12.	Stakeholder L	7	100	effective

Table 7
Sociomatrix of positive mutual choice

№	stakeholder	1	2	3	4	5	6	7	8	9	10	11	12	∑
1	A	X		+3				+2					+1	3
2	B		X	+1		(+3)							+2	3
3	C			X				(+1)			(+3)		+2	3
4	D			+2	X								+1	2
5	E		(+1)			X		+3					+2	3
6	F	X	X	X	X	X	X	X	X	X	X	X	X	0
7	G		+3	(+2)				X					(+1)	3
8	H		+3	+2				+1	X					3
9	I	X	X	X	X	X	X	X	X	X	X	X	X	0
10	J			(+1)	+3	+2					X			3
11	K	+2		+3								X	(+1)	3
12	L							(+2)			+3	(+1)	X	3
∑		1	3	7	1	2	0	5	0	0	2	1	7	29
Points		2	5	14	1	3	0	11	0	0	2	3	18	
Soc. status (+)		3	8	21	2	5	0	16	0	0	4	4	25	

* formed by the authors based on their own research

◯ - positive mutual choice.

Stakeholders C, E, G, J, K and L consider collaboration in the educational space effective, while the rest of the stakeholders hold that cooperation in the educational space is of moderate effectiveness to them. The positive fact is that no stakeholder has diagnosed the collaboration as ineffective. Next, we conduct a sociometric study of the interaction of stakeholders in the educational space. The stakeholders were asked questions to study their interaction in collaboration:

1 Choose three stakeholders you would like to work with.
2 Select three stakeholders you would not like to work with.

The Socio Matrix is based on the first criterion: Select three stakeholders you would like to work with. Table 7 shows the data. Let us analyze Table 1: "X" indicates that the stakeholder has not been selected: diagonally we denote self-selection, that is, the stakeholder cannot cooperate with himself. Moreover, horizontal "X" means that the stakeholder refused to participate in the poll.
If a stakeholder is ranked first on the list of another stakeholder, he / she will receive +3 points, second – +2 points and third – +1 point. If the stakeholders have chosen each other to cooperate, then a positive mutual choice is made and rounded off.

Next, we summarize horizontally and vertically the number of choices, and vertically also determine the point equivalent. That is, the sum of the received points is carried out, but with the changed value: +3 – 1 point, +2 – 2 points, and +1 – 3 points. And, the last step is to determine the positive social status (social status +): we summarize the line 'the number of choices' and the sum of points (1 + 2, 3 + 5, 7 + 14).
The following socio-matrix is made by the second criterion: Choose three stakeholders we would not like to work with. Table 8 shows the data. We compile the table in the same way as Table 6, only with a negative selection, that is, we identify the stakeholders who are not desirable.

Table 8
Sociomatrix of negative mutual choice

№	stakeholder	1	2	3	4	5	6	7	8	9	10	11	12	∑
1	A	X					-1			-2				2
2	B		X					-1						1
3	C			X										0
4	D		-3		X		-1			-2				3
5	E					X				-1	-2			2
6	F	X	X	X	X	X	X	X	X	X	X	X	X	0
7	G	-2					-1	X						2
8	H								X				◇-1◇	1
9	I	X	X	X	X	X	X	X	X	X	X	X	X	0
10	J		-2							-1	X			2
11	K											X		0
12	L			-3			-1		◇-2◇				X	3
∑		1	2	1	0	0	4	1	1	4	1	0	1	16
Points		2	3	1	0	0	12	3	2	10	2	0	3	
Soc. status		3	5	2	0	0	16	4	3	14	3	0	4	

* formed by the authors based on their own research
◇ - negative mutual choice

Let us combine the obtained results in the positive and negative selection socio-matrices into Table 9.

Table 9
Combined socio-matrix

№	1	2	3	4	5	6	7	8	9	10	11	12
+	+ 3	+ 8	+ 21	+ 2	+ 5	0	+ 16	0	0	+ 4	+ 4	+ 25
-	- 3	- 5	- 2	0	0	- 16	- 4	- 3	- 14	- 3	0	- 4
∑	0	3	19	2	5	- 16	12	- 3	- 14	1	4	21

* formed by the authors based on their own research

Let us calculate for each stakeholder a number of indicators that are called individual sociometric indices.

$$C_A = \frac{1+1}{11} = 0{,}18; \quad C_E = \frac{2+0}{11} = 0{,}18; \quad C_I = \frac{0+4}{11} = 0.36;$$
$$C_B = \frac{3+2}{11} = 0{,}45; \quad C_F = \frac{0+4}{11} = 0{,}36; \quad C_J = \frac{2+1}{11} = 0.27;$$
$$C_C = \frac{7+1}{11} = 0{,}72; \quad C_G = \frac{5+1}{11} = 0{,}55; \quad C_K = \frac{1+0}{11} = 0{,}09;$$
$$C_D = \frac{1+0}{11} = 0{,}09; \quad C_H = \frac{0+1}{11} = 0{,}09; \quad C_L = \frac{7+1}{11} = 0.72.$$

As the index *Ci* takes into account the attitude of stakeholders to each other and characterizes the value of its prestige in different situations, the best for cooperation are 3 stakeholders.: C and L (C_i = 0.72), G (C_i = 0.55) because their indexes are approaching 1. They are highly respected by other stakeholders.

Individual Expansiveness Index *Ej*:

$$E_A = \frac{3+2}{11} = 0.45; \quad E_E = \frac{3+2}{11} = 0{,}45; \quad E_I = \frac{0}{11} = 0;$$
$$E_B = \frac{3+1}{11} = 0{,}36; \quad E_F = \frac{0}{11} = 0; \quad E_J = \frac{3+2}{11} = 0{,}45;$$
$$E_C = \frac{3+0}{11} = 0{,}27; \quad E_G = \frac{3+2}{11} = 0{,}45; \quad E_K = \frac{3+0}{11} = 0{,}27;$$
$$E_D = \frac{2+3}{11} = 0{,}45; \quad E_H = \frac{1+3}{11} = 0{,}36; \quad E_L = \frac{3+3}{11} = 0.55.$$

Index *Ej* characterizes the degree of communication of stakeholders with each other and reflects the relationship of each stakeholder to the group of stakeholders as a whole. The closer to 1 or equals 1, the better the ratio of stakeholders to the group of stakeholders as a whole. In this case, there is only one stakeholder in which the individual expansibility index is closest to 1, this is the stakeholder L (Ej = 0.55).

In addition to individual sociometric indices, group indices are also calculated.

Group expansiveness index E:

$$E = \frac{29+16}{12*11} = \frac{45}{132} = 0.34$$

Index E describes the overall activity of the interaction of the group, expresses the dynamics of its life.

The closer it gets to 1, the more intense the group's activity. The calculations show that E = 0.34, therefore the interaction activity in the group is average.

Group reciprocity index C:

$$C = \frac{29}{12*11} = \frac{29}{132} = 0.22 .$$

The calculation shows that the stakeholders selected for the study are not in close communication with each other and are not cohesive as index C is significantly less than 1.

Group integration index I:

$$I = \frac{12-3}{12} = \frac{9}{12} = 0.75 .$$

This stakeholder association integrates its members into an integral whole, although the stakeholder cohesion is not great. Also, based on knowing individual sociometric status indices, the status of each stakeholder in a cooperative association is evaluated and analyzed. According to the results of these indices, the “leader – star” is defined which are the stakeholders denoted by the letters L and C. Let's determine how many microgroups exist in this association of stakeholders. Microgroups were identified by positive mutual selection. We write in the column positive horizontal and vertical choices and with a help of crosses indicate those who selected whom horizontally and vertically. For simplicity of construction and anonymity we use the codes of surnames from socio-matrices 6 and 7, where the figure is the order number of the stakeholder and the letter stands for the code of the stakeholder. There are two microgroups in the stakeholder association, which can be seen in Fig. 3.

Name	2	5	3	7	10	12	11
2 B		X					
5 E	X						
3 C				X	X		
7 G			X			X	
10 J			X				
12 L				X			X
11 K						X	

Fig. 3. Microgroups of the analyzed stakeholders

* formed by the authors based on their own research

The first microgroup is a dyad, which consists of two stakeholders – B and E, the second microgroup consists of 5 stakeholders: B, G, J, L and K. However, in Stakeholder association there is such a negative factor as “ignored”. These are stakeholders who have received only negative reviews. They are stakeholders F, I and H.

F and I received a negative rating because they refused to participate in a sociological survey. They always refuse to participate in the public life of the stakeholder association. Most stakeholders would prefer not to cooperate with them, but they have a high level of social investment and are desirable from a professional point of view. H received only one negative rating and none positive. Therefore, it can be considered isolated. This stakeholder is undesirable for the whole stakeholder association. He tries to please every stakeholder and interferes with his boredom. So they try to avoid him. But he also does his job well. Therefore, he is desirable for the professional level to cooperate. The stakeholder association is determined to put up with the discomfort and not lose a qualified stakeholder.

Table 9 summarizes the social status of the stakeholder association:

- L;
- C;
- G;
- E;
- K;
- B;
- D;
- J;
- A;
- H;
- I;
- F.

Let's analyze the social status of stakeholder association. The highest score was received by the stakeholder under the letter L (21 points). As this stakeholder is not the leader of the stakeholder association, he is the informal leader № 1. Second in the ranking is the stakeholder under letter C (19 points). This stakeholder is not the leader of the stakeholder association, and the informal leader № 1 already exists, he is the informal leader № 2. Third in the ranking is the stakeholder under the letter G (12 points). This stakeholder is the acting leader of the stakeholder association.

4. Conclusions

Thus, the system of diagnosing stakeholders in the educational space must be accompanied by the achievement of the goals of the university, that is to be purposeful. Achieving the goals and cooperation of stakeholders with universities are two essential components of the protocol for diagnosing educational stakeholders.The relationship of stakeholders with each other, the degree of communication of stakeholders with each other, the ratio of each stakeholder to the group of stakeholders as a whole, the total activity of group interaction based on the calculation of sociometric indicators were stablished. The scheme of implementation of the protocol of diagnosing stakeholders of educational space, which is aimed at meeting the needs and interests of both external contractors and the university, which will provide efficiency in achieving the goals of the university was proposed. The techniques of the level of involvement of stakeholders in the activities of the university and the express assessmentof the effectiveness of the cooperation of stakeholders with the university were improved. Stakeholder social rankings in the association were obtained, demonstrating the importance of each stakeholder in collaboration.

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