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COGNITIVE MODELING OF FINANCIAL AND ECONOMIC PROVISION OF QUALITY ACTIVATION OF HIGHER EDUCATION

Abstract. The article develops and substantiates the need to determine the causal links between concepts that contribute to the quality of higher education. The lack of motivation for radical reform of higher education is still hampered by attempts to use the successful international experience of the process of building a full-fledged system of quality assurance in the provision of educational services. The aim of the article is to develop a model for identifying causal links between the concepts of financial and economic support, which contribute to improving the quality of higher education. A system of concepts of the internal state and macro-environment of financial security has been formed, which has a positive or negative impact on the intensification of higher education. A fuzzy cognitive map of the impact of financial and economic support on improving the quality of higher education has been built. Scales and criteria for providing a qualitative assessment of the impact of the concepts of financial and economic support for the intensification of higher education in accordance with the introduced linguistic sets are calculated on the basis of the trapezoidal number method. The concepts of internal state and macroenvironment for activation of higher education are defined. The negative impact on the level of public spending on education and opportunities for access to ICT, which constrains the prospects for development and realization of the potential of participants in the higher education process, has been proved. The negative impact on the quality of higher education on the migration of students to study abroad has been identified, as access to higher education is almost unlimited due to significant government procurement and relatively low cost of contract education, and the return on higher education is relatively low. According to the simulation results, in order to intensify higher education, it is necessary to focus on the quality of teachers, provide opportunities for development, competence development, obtaining a higher level of qualification, which includes postgraduate and doctoral studies and academic degrees. Currently, an important priority of the European innovation system is the formation of the European Research Area. That is why there is a need to find effective mechanisms to influence the quality of research and innovation, which is represented by the number of publications / patents / CAT, investment and innovation projects, grants. Support for these concepts will provide an opportunity to unleash scientific and innovative potential, have a high social status in society and will improve the quality of educational services provided.

Keywords: higher education, cognitive modeling, financial and economic support, consonance and dissonance, influence on the system, concepts of internal state, concepts of macroenvironment.

JEL Classification I22, G17

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КОГНІТИВНЕ МОДЕЛЮВАННЯ ФІНАНСОВО-ЕКОНОМІЧНОГО ЗАБЕЗПЕЧЕННЯ АКТИВІЗАЦІЇ ЯКОСТІ ВИЩОЇ ОСВІТИ

Анотація. Розроблено та обґрунтовано необхідність визначення причинно-наслідкових зв'язків між концептами, які сприяють активізації якості вищої освіти. Брак мотивації для радикального реформування вищої освіти досі гальмують спроби використання успішного міжнародного досвіду процесу побудови повноцінної системи забезпечення якості надання освітніх послуг. Метою статті є розроблення моделі для виявлення причинно-наслідкових зв'язків між поняттями фінансово-економічної підтримки, які сприяють підвищенню якості вищої освіти. Сформовано систему концептів внутрішнього стану та макрооточення фінансового забезпечення, які чинять позитивний чи негативний вплив на активізацію вищої освіти. Побудовано нечітку когнітивну карту впливу фінансово-економічного забезпечення на підвищення якості вищої освіти. Шкали і критерії для надання якісної оцінки впливу концептів фінансово-економічного забезпечення активізації вищої освіти відповідно до введених лінгвістичних множин розраховано на основі методу трапецієподібних чисел. Визначено концептам внутрішнього стану і макрооточення для активізації вищої освіти. Доведено негативний вплив на рівень державних витрат на освіту та можливості доступу до ІКТ, що стримує перспективи розвитку і реалізації потенціалу учасників процесу вищої освіти. Визначено негативний вплив на якості вищої освіти на міграцію студентів на навчання за кордон, адже доступ до вищої освіти практично необмежений через суттєве державне замовлення і порівняно низьку вартість навчання на контрактній формі, а віддача від вищої освіти порівняно низька. Відповідно до результатів моделювання для активізації вищої освіти необхідно зосередити увагу на якісному складі викладачів, надавати можливості для розвитку, підвищення компетентностей, отримання більш високого рівня кваліфікації, що передбачає навчання в аспірантурі й докторантурі та отримання вчених звань. Наразі важливим пріоритетом європейської інноваційної системи є формування Європейського дослідницького простору. Саме тому виникає необхідність пошуку дієвих механізмів впливу на якість науково-інноваційної діяльності, що представлена кількістю публікацій / патентів / САТ, інвестиційних та інноваційних проєктів, грантів. Підтримка цих концептів надасть можливість розкрити науково-інноваційний потенціал, мати високий соціальний статус у суспільстві та дозволить підвищити якість наданих освітніх послуг.

Ключові слова: вища освіта, когнітивне моделювання, фінансово-економічне забезпечення, консонанс і динсонанс, вплив на систему, концепти внутрішнього стану, концепти макрооточення.

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Introduction. Reforming the Ukrainian higher education system is based on the priority of ensuring the quality of educational services, which will contribute to the formation of productive, competitive professionals who will be the key to further development of society. This is due to the fact that there is an awareness of the dependence of the state of development of the country and its economic competitiveness on the quality of human resources, as well as — the dependence of the competitiveness of graduates on the quality of educational services.

Modern development of the higher education system involves expanding the autonomy of higher education institutions (HEIs), reducing direct state control over institutions, diversifying instruments for attracting financial resources, strengthening the interaction of the «knowledge triangle» (education — science — innovation) and focusing on public expectations in mutual understanding and trust between participants in the quality assurance system of higher education. The national system of higher education must take into account both the global trends of the modern world and the national characteristics of the state. Activation of higher education involves such aspects as determining the content of education and management of the university; transition from the paternalistic model of direct state control over academic institutions to the practice of independent expert evaluation of their activities and management of financial incentives for quality assurance; search for ways to diversify financial sources and develop an entrepreneurial mentality under the influence of competition in the market of educational services; growing public expectations about the social responsibility of the university; finding a more productive synthesis between education, research and innovation within the university walls.

Research analysis and problem statement. Problems of cognitive modeling have been studied by such well-known scientists as R. Axelrod [1], B. Kosko [2], V. Silov [3], A. Firsova, L. Makarova, R. Tugusheva [4], D. D. Baccan [5] and others. Aspects of the analysis of situations that are insufficiently studied include methods of structuring situations, such as building cognitive maps based on work with experts, methods of explaining the results and adjusting models of the situation based on the results of the analysis.

The research of A. Firsova, L. Makarova, R. Tugusheva [4] is aimed at finding appropriate indicators and effective tools for modeling the impact and institutional governance between regional innovation systems and higher education institutions. Analysis of system indicators of the cognitive map allowed to identify the main patterns in the regional system that determine the most significant factors and relationships, identify the impact of elements of the innovation environment on targets, quantify its positive and negative impact, predict and identify areas for improvement.

The conceptual cognitive model and implementation of D. D. Baccan [5] can be used to develop new (potentially better and highly profitable) financial services to support market participants' decision-making based on his / her emotions, behavior, and so on.

The study by R. Diris and E. Ooghe [6] examines in detail the different ways of financing higher education. OECD private return calculations confirm that private incentives to invest in higher education are high. However, economic theory states that it is the marginal social return that should govern a policy that reflects both considerations of justice and efficiency. For a large part of the countries considered, the transition to contingent loans or taxes on graduates seems more appropriate, given both efficiency and equity.

D. Mahona's study [7] aimed to involve the private sector in higher education: growth issues and administrative problems. Current research has shown that private universities make a significant contribution to providing quality education. However, they face problems such as lack of funds, research and publications, quality assurance, which hampers the growth of private universities and the loss of qualified experienced teachers.

The report [8] contains a review of the literature and an in-depth analysis of eleven case studies involving innovative practices for the professional development of scientists. The aim is to identify trends in current practice, the future prospects of European higher education institutions and the challenges they face.

The aim of the article is to develop a model for identifying causal links between the concepts of financial and economic support, which contribute to enhancing the quality of higher education.

Methodology and research methods. To reduce the degree of subjectivity, increase the validity and reliability of judgments can be used special procedures for extracting and processing expert information, aimed at reducing the degree of subjectivity by breaking the general task of assigning the impact of causation on a number of simpler subtasks. In this case, the value of the influence of causal relationships can be obtained using methods for constructing membership functions of discrete fuzzy sets (*Table 1*).

Table 1

Methods for constructing membership functions of discrete fuzzy sets

Method	Author	Characteristic
Method of pairwise comparisons	T. Saati [9]	the main idea is to process the expert's judgments about the relative superiority of the degrees of belonging of different elements
Method set level	R.R. Jaeger [10]	based on the identification of level sets of the desired fuzzy set

Source: formed by the authors.

To do this, the paper proposes the following approach. Each concept is associated with two fuzzy sets:

- many concepts that affect this concept;
- many concepts that are subject to influence from this concept.

At the next stage to the constructed map the methods of analytical processing focused on research of structure of system and reception of forecasts of its behavior at various control influences are applied. The methods of the analysis of cognitive maps used at the same time can be divided into two groups:

1) static methods related to the study of the strength of interactions between concepts (including those that do not have a direct relationship), or concept and system, based on the analysis of system indicators of the cognitive map (consonance, dissonance, impact indicator, etc.);

2) dynamic methods focused on the study of the dynamics of system behavior over time, one of the ways to describe which is a model of the impulse process.

Based on the matrix Z, the following basic system parameters of fuzzy Silov V. B. maps can be calculated [3].

Influence (influence) of the i-th concept on the j-th (under the influence means the dominant force between the concepts):

$$p_{ij} = \text{sign}\,(z_{ij} + z^{-}{}_{ij})\,\max\,(|z_{ij}|, |z^{-}{}_{ij}|), (|z_{ij}| \neq |z^{-}{}_{ij}|), \quad (1)$$

Here and further:

z_{ij} — the strength of the positive impact of the *i*-th concept on the *j*-th,

$z^{-}{}_{ij}$ — the strength of the negative impact of the *i*-th concept on the *j*-th.

Mutual (joint) positive impact:

$$\overleftrightarrow{p_{ij}} = \overleftrightarrow{p_{ji}} = S\,(z_{ij,} z_{ji}), \quad (2)$$

where *S* — corresponding *S*-norm (maximum operation).

Mutual (joint) negative impact:

$$\overleftrightarrow{n_{ij}} = \overleftrightarrow{n_{ji}} = -S\,(z^{-}{}_{ij,} z^{-}{}_{ji}). \quad (3)$$

Consonance of the influence of the *i*-th concept on the *j*-th (expresses the degree of confidence in the sign and the strength of influence: the higher the consonance, the more convincing the opinion):

$$c_{ij} = \frac{|z_{ij} + z^{-}{}_{ij}|}{|z_{ij}| + |z^{-}{}_{ij}|}. \quad (4)$$

Consonance of interaction of the *i*-th and *j*-th concepts:

$$\overleftrightarrow{C}{}_{ij} = \overleftrightarrow{C}{}_{ji} = \frac{|(z_{ij} + z_{ji}) + (z^{-}{}_{ij} + z^{-}{}_{ij})|}{|(z_{ij} + z_{ji})| + |(z^{-}{}_{ij} + z^{-}{}_{ij})|}. \quad (5)$$

Influence (influence) of the *i*-th concept on the system:

$$\overrightarrow{P_i} = \frac{1}{n}\sum_{j=1}^{n} p_{ij}. \quad (6)$$

Influence (influence) of the system on the *j*-th concept:

$$\overleftarrow{P_j} = \frac{1}{n}\sum_{i=1}^{n} p_{ij}. \quad (7)$$

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Consonance of the influence of the *i*-th concept on the system:

$$C_i^{\rightarrow} = \frac{1}{n}\sum_{j=1}^{n} c_{ij}. \quad (8)$$

Consonance of the system's influence on the *j*-th concept:

$$C_j^{\leftarrow} = \frac{1}{n}\sum_{i=1}^{n} c_{ij}. \quad (9)$$

On the basis of the analysis of system indicators and α-sections the concepts promoting, and interfering, and also degree and reliability of their influence are allocated.

Results of the research. Having defined its national guidelines, Ukraine has committed itself to bringing the quality of the national education system in line with European standards Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) [11]. According to the results of the ESG analysis, it was determined that the activation of the quality of higher education should consist of such components as internal and external quality assurance in higher education institutions.

At the level of internal support (status) it is necessary to ensure the development of: internal monitoring of evaluation of students and entrants; providing human resources to work in these institutions; criteria for the quality of free economic zones; create a system of technical quality assurance of education.

At the level of the external level of ensuring (macroenvironment) the quality of higher education and educational activities of the Free Economic Zone, it is advisable for the university to establish a relationship with external stakeholders (employers); determine the requirements for the state regulation of the quality of higher education; to form procedures for conducting scientific, technical and innovative research in these institutions (*Table 2*).

Table 2

Concepts influencing the quality assurance of higher education

Group	Subgroup	Concepts	Marking
Concepts of internal state	Applicants	Number of school graduates	E_{111}
		Number of people who pass the external evaluation	E_{112}
	Students	Number of Ukrainian students studying in Ukraine	E_{121}
		Number of foreign students studying in Ukraine	E_{122}
		Number of Ukrainian students studying abroad	E_{123}
	Teachers	Number of teachers	E_{131}
		The ratio of teachers to students	E_{132}
		Number of graduate / doctoral students	E_{133}
		Number of associate professors / professors	E_{134}
		The level of workload of the teacher	E_{135}
		Teacher's salary	E_{136}
		The need for part-time work	E_{137}
	HEI	Branching of free economic zones	E_{141}
		Share of freelance / doctoral studies	E_{142}
	Material-technical base	Provision of fixed assets and computer equipment	E_{151}
		Opportunities for access to ICT	E_{152}
Concepts of macroenvironment	Business	Level of students' involvement in practice / work	E_{211}
		The amount of funding for research and practical projects	E_{212}
		Proportion of students studying at the expense of legal entities	E_{213}
	State regulation	Share of education expenditures	E_{221}
		The volume of the state order	E_{222}
		Legislative and institutional support	E_{223}
	Scientific, technical and innovative support	Number of publications / patents / CAT	E_{231}
		Number of investment and innovation projects, grants	E_{232}

Source: formed by the authors.

Based on the obtained results, a cognitive matrix is formed, which contains averaged (taking into account the opinions of all experts) estimates of the intensity of influences, on the basis of which a fuzzy cognitive map is built (*Table 3, Fig.*).

Table 3

Cognitive matrix of causal relations of activating the quality of higher education

	E_{111}	E_{112}	E_{121}	E_{122}	E_{123}	E_{131}	E_{132}	E_{133}	E_{134}	E_{135}	E_{136}	E_{137}	E_{141}	E_{142}	E_{151}	E_{152}	E_{211}	E_{212}	E_{213}	E_{221}	E_{222}	E_{223}	E_{231}	E_{232}
E_{111}		+1	+1	0	+1	0	+1	0	0	+1	+1	0	+1	0	0	0	-1	0	-1	-1	-1	0	0	0
E_{112}	0		+1	0	0	0	+1	0	0	+1	+1	0	+1	0	0	0	-1	0	-1	-1	-1	0	0	0
E_{121}	0	0		0	-1	0	+1	0	0	+1	+1	0	+1	0	0	0	-1	0	-1	-1	0	0	0	0
E_{122}	0	0	0		0	0	+1	0	0	+1	+1	0	+1	0	0	0	0	0	-1	0	-1	0	0	0
E_{123}	0	0	-1	0		0	-1	0	0	-1	-1	0	-1	0	0	0	+1	0	+1	+1	0	0	0	0
E_{131}	0	0	0	0	0		+1	+1	+1	-1	-1	0	0	0	0	0	0	0	0	0	0	0	+1	+1
E_{132}	+1	+1	+1	+1	-1	+1		0	0	-1	-1	0	0	0	0	0	0	0	0	0	0	0	0	0
E_{133}	0	0	0	0	0	+1	+1		+1	0	0	0	0	0	0	0	0	0	0	0	0	0	+1	+1
E_{134}	0	0	0	0	0	+1	+1	0		0	0	0	0	0	0	0	0	0	0	0	0	0	+1	+1
E_{135}	0	0	0	0	-1	0	0	-1	-1		+1	+1	0	0	0	0	0	0	0	0	0	0	-1	-1
E_{136}	0	0	0	0	0	-1	-1	-1	+1	+1		-1	0	0	0	0	0	0	0	0	0	0	+1	+1
E_{137}	0	0	0	0	0	-1	-1	-1	-1	-1	-1		0	0	0	0	+1	+1	+1	0	0	0	-1	-1
E_{141}	0	0	+1	+1	-1	+1	+1	+1	+1	+1	+1	+1		+1	0	0	0	0	0	-1	-1	0	0	-1
E_{142}	0	0	0	0	0	+1	-1	-1	+1	+1	+1	+1	+1		0	0	-1	0	0	-1	0	0	+1	+1
E_{151}	0	0	0	0	0	-1	-1	-1	0	0	0	0	0	0		0	0	0	0	0	0	0	-1	-1
E_{152}	0	0	0	0	0	-1	-1	-1	0	0	0	0	0	0	0		0	0	0	0	0	0	-1	-1
E_{211}	0	0	+1	+1	-1	0	+1	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0
E_{212}	0	0	0	0	0	0	0	+1	+1	0	+1	0	0	+1	+1	+1	+1		0	0	0	0	-1	-1
E_{213}	0	0	+1	0	-1	0	+1	0	0	0	0	0	0	0	0	0	+1	0		-1	-1	0	0	0
E_{221}	0	+1	-1	0	-1	-1	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	0	0	0		-1	0	-1	-1
E_{222}	0	0	-1	0	-1	0	-1	-1	+1	-1	+1	+1	+1	+1	0	0	0	0	0	0		0	0	0
E_{223}	0	-1	-1	-1	+1	-1	-1	-1	-1	+1	+1	+1	+1	+1	+1	0	-1	-1	-1	-1	-1		0	0
E_{231}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+1		+1
E_{232}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+1	+1	

Source: formed by the authors.

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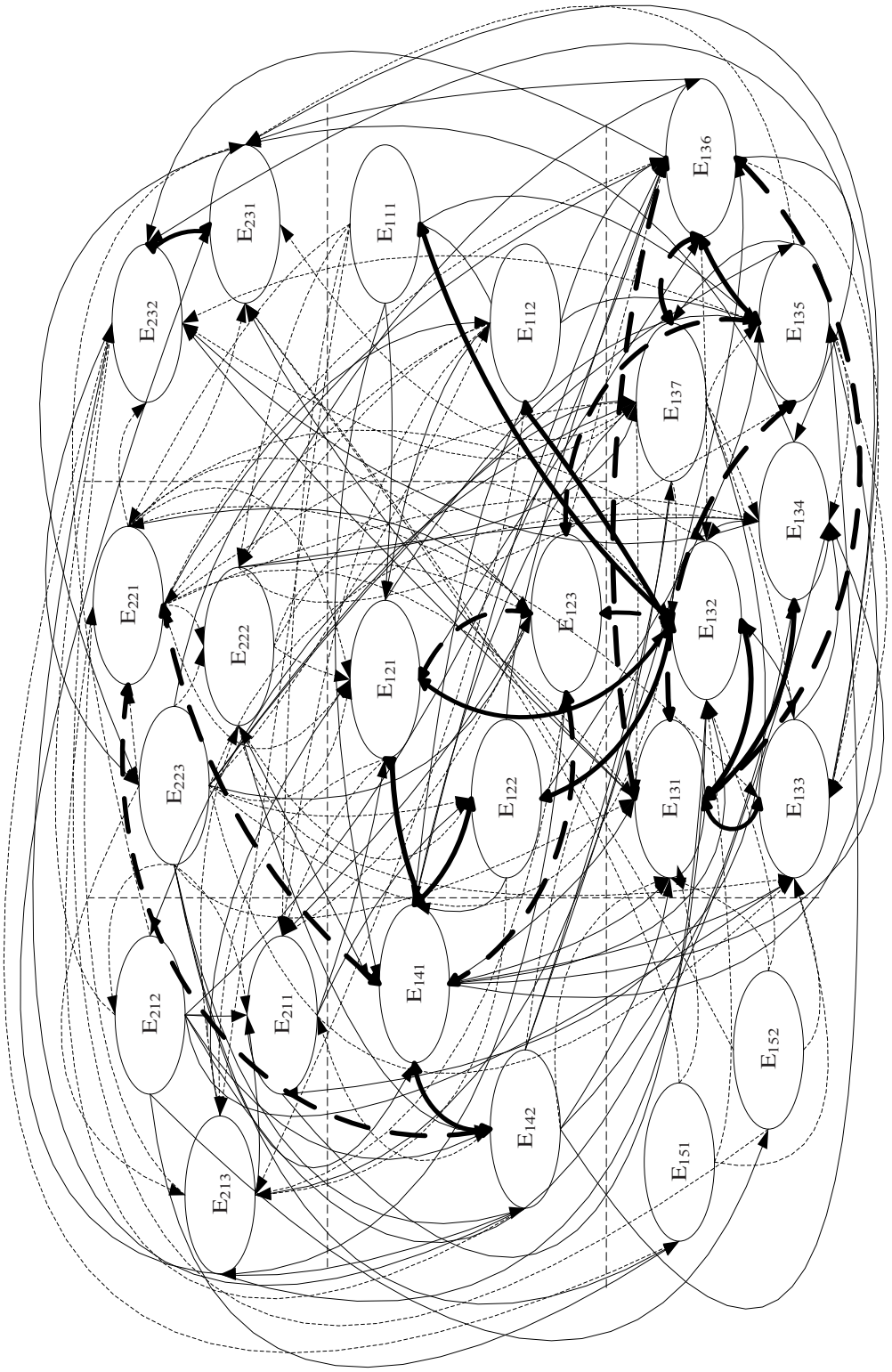

Fig. **Significant digraph of the cognitive map of the impact of causal links to enhance the quality of higher education**

Source: built by the authors.

This information is used to generate alternatives, which are then tested using dynamic modeling based on the method of pulse processes (*Table 4*).

Table 4

Assessment of systemic characteristics of the cognitive model for identifying causal links to enhance the quality of higher education

Concept		Consonance of influence of system on the concept	Dissonance of influence of system on the concept	Consonance of influence of the concept on system	Dissonance of influence of the concept on system
Number of school graduates	E_{111}	0,875	0,125	0,648	0,352
Number of people who pass the external evaluation	E_{112}	0,875	0,125	0,606	0,394
Number of Ukrainian students studying in Ukraine	E_{121}	0,691	0,309	0,568	0,432
Number of foreign students studying in Ukraine	E_{122}	0,875	0,125	0,691	0,309
Number of Ukrainian students studying abroad	E_{123}	0,568	0,432	0,049	0,951
Number of teachers	E_{131}	0,687	0,313	0,846	0,154
The ratio of teachers to students	E_{132}	0,657	0,343	0,463	0,237
Number of graduate / doctoral students	E_{133}	0,475	0,525	0,958	0,042
Number of associate professors / professors	E_{134}	0,709	0,291	0,958	0,042
The level of workload of the teacher	E_{135}	0,636	0,364	0,586	0,414
Teacher's salary	E_{136}	0,638	0,362	0,663	0,337
The need for part-time work	E_{137}	0,702	0,298	0,697	0,303
Branching of free economic zones	E_{141}	0,702	0,298	0,704	0,296
Share of freelance / doctoral studies	E_{142}	0,705	0,295	0,699	0,301
Provision of fixed assets and computer equipment	E_{151}	0,619	0,381	0,500	0,500
Opportunities for access to ICT	E_{152}	0,386	0,614	0,500	0,500
Level of students' involvement in practice / work	E_{211}	0,616	0,384	0,747	0,253
The amount of funding for research and practical projects	E_{212}	0,875	0,125	0,958	0,042
Proportion of students studying at the expense of legal entities	E_{213}	0,584	0,416	0,546	0,454
Share of education expenditures	E_{221}	0,502	0,498	0,587	0,413
The volume of the state order	E_{222}	0,667	0,333	0,663	0,337
Legislative and institutional support	E_{223}	0,875	0,125	0,499	0,501
Number of publications / patents / CAT	E_{231}	0,733	0,267	0,958	0,042
Number of investment and innovation projects, grants	E_{232}	0,703	0,297	0,958	0,042

Source: authors' own calculations.

According to the calculations, we consider it appropriate, in addition to quantitative calculations, to provide their qualitative estimates in accordance with the linguistic sets (*Table 5*).

Table 5

Scales and criteria for systemic characteristics of the cognitive model for identifying causal links to enhance the quality of higher education

Designation of the integrated indicator	Criteria for systemic characteristics of the cognitive model for identifying causal links to enhance the quality of higher education		
	L	M	H
Consonance of the system's influence on the concept	[0,386; 0,549)	[0,55; 0,701)	[0,702; 0,875]
Dissonance of the system's influence on the concept	[0,125; 0,299)	[0,300; 0,430)	[0,431; 0,614]
Consonance of the influence of the concept on the system	[0,049; 0,352)	[0,353; 0,655)	[0,656; 0,958]
Dissonance of the influence of the concept on the system	[0,042; 0,311)	[0,312; 0,499)	[0,500; 0,951]

Source: authors' own calculations.

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Conclusions. According to the results of calculations, a high level of consonance of the system's impact on the concept is exerted by: the number of school graduates, persons passing external examinations and foreign students studying in Ukraine (0.875), legislative and institutional support (0.875), number of publications / patents / CAT (0.733), the number of associate professors / professors (0.709), the share of freelance / doctoral (0.705), the number of investment and innovation projects, grants (0.703), the branching of freelance (0.702), the need for part-time work (0.702).

Therefore, to intensify higher education it is necessary to pay special attention to:

concepts of internal state: the number of entrants, which is the dependence of the demographic situation in the country and the basis of human potential; the number of foreign students, which is the result of the level of investment potential and determines the attractiveness of immigration processes; the number of free economic zones and their share with postgraduate and doctoral studies, which affects the opportunities and prospects of human development; the need for the teacher to work part-time, which determines the working conditions and prospects for personal development;

concepts of macroenvironment: legislative and institutional support is the basis of economic development of the country and conditions for human development; the number of publications / patents / CAT, investment and innovation projects, grants is the result of innovation and scientific and technical activities and determines the level of the public country.

The high level of dissonance of the system's influence on the concept is provided by opportunities for access to ICT (0.614), number of graduate / doctoral students (0.525), share of education expenditures (0.498), number of Ukrainian students studying abroad (0.432).

The analysis of the dissonance of the system's influence on the concept necessitates the support of postgraduate and doctoral students in order to stimulate creative potential and intensify the development of education and science in Ukraine. There is also a negative impact on the level of public spending on education and access to ICT, which hinders the prospects for development and realization of the potential of participants in the process of higher education. It should be noted the negative impact on the quality of higher education on the migration of students to study abroad, because access to higher education is virtually unlimited due to significant government procurement and relatively low cost of contract education, and the return on higher education is relatively low.

The high level of consonance of the concept's impact on the system is defined in such concepts as number of graduate students / doctoral students, associate professors / professors (0.958), amount of funding for research and practical projects (0.958), number of publications / patents / CAT, investment and innovation projects, grants (0.958), number of teachers (0.846), branching of free economic education (0.704), share of free economic education with postgraduate / doctoral studies (0.699), need for part-time teacher (0.697), teacher's salary (0.663), volume of state order (0.663).

According to the simulation results, in order to intensify higher education, it is necessary to focus on the quality of teachers, provide opportunities for development, competence development, obtaining a higher level of qualification, which includes postgraduate and doctoral studies and academic degrees. Factors such as wages and the need to work part-time also significantly affect the internal state of participants in the higher education process. Currently, an important priority of the European innovation system is the formation of the European Research Area. That is why there is a need to find effective mechanisms to influence the quality of research and innovation, which is represented by the number of publications / patents / CAT, investment and innovation projects, grants. Support for these concepts provides an opportunity to unleash scientific and innovative potential, have a high social status in society and improve the quality of educational services.

The high level of dissonance of the concept's impact on the system is defined in such concepts as Number of Ukrainian students studying abroad (0.951), legislative and institutional support (0.501), provision of fixed assets and computer equipment and opportunities for access to ICT (0.500), the share of students studying at the expense of legal entities (0.454).

The lack of motivation for radical reform of higher education is still hampered by attempts to use the successful international experience of the process of building a full-fledged system of quality assurance in the provision of educational services. First of all, the imperfection of legislative and institutional support does not allow for the successful development of the educational system. The state order for the training of specialists with higher education is formed without proceeding from the needs of the market, the interest of legal entities in financing the training of specialists is practically absent.

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