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FINANCIAL AND LEGAL ENSURES EFFECTIVE DEVELOPMENT FOR HIGHER EDUCATION IN UKRAINE

Abstract. Due to the low level of the competition of Ukrainian education in the global educational space, to the inefficiency of the model of financing to pedagogical activity in higher education, the issue to improve the legislative and regulatory framework for financing of pedagogical activity has been actualized. It is in order to achieve the goals of reform in higher education and the main missions of higher education institutions that it is necessary to ensure a qualitative updating of the legal framework in the field of higher education financing, in particular for the provision of pedagogical activities. In view of this, the aim of this article is to substantiate the directions for improving the legal framework of financing quality of pedagogical activity in higher education in Ukraine in the present conditions. In the course of the research on the basis of literary generalization, the main indicators of the effectiveness of pedagogical activity in higher education and the shortcomings of the legislative base of its financing have been determined. Based on factor analysis and performance indicators for 2000—2019, the prioritization of factors effectiveness of the pedagogical activity has been determined and the impact of funding sources on the factors of pedagogical effectiveness in higher education. Using the autoregressive method, vector autoregressive models of the impact of financial support on pedagogical effectiveness has been formulated. The peculiarities of the influence of the sources of educational financing on the factors of the effectiveness of pedagogical activity have been argued. With the using of structural and logical modeling, the model of improving the regulatory framework of the regulation of the quality of higher education was proposed, have been taking into account the nature of the impact of the level of financing to the effectiveness of the pedagogical activity. The model proposed was based on the regulation of the main educational normative of legal acts for the introduction of the principles of the model of financing pedagogical activity using performance-based financing indicators. The results of this theoretical and empirical research have scientific value and applied character. The practical implementation of the proposed measures would become a basis of the formation of a decent and progressive legal framework for the implementation of an effective model of financing pedagogical activities. This would help to improve the quality of higher education in Ukraine, stimulate higher education institutions to form a new model of behavior — quality and efficiency above all.

Keywords: Ukraine, financing, financial resources, pedagogical activity, educational legislative acts, higher education.

JEL Classification I23, K1, H52

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ФІНАНСОВО-ПРАВОВЕ ЗАБЕЗПЕЧЕННЯ ЕФЕКТИВНОСТІ ПЕДАГОГІЧНОЇ ДІЯЛЬНОСТІ В СИСТЕМІ ВИЩОЇ ОСВІТИ УКРАЇНИ

Анотація. У зв'язку з низьким рівнем конкурентоспроможності освіти України у глобальному освітньому простоті, що зумовлений неефективністю моделі фінансового забезпечення педагогічної діяльності в системі вищої освіти, актуалізується питання щодо вдосконалення законодавчо-нормативної бази фінансування педагогічної діяльності. Саме з метою досягнення вказаних цілей реформування у сфері вищої освіти та основних місій вищих навчальних закладів необхідно забезпечити якісне оновлення нормативно-правової бази у сфері фінансування вищої освіти, зокрема щодо забезпечення педагогічної діяльності. У зв'язку з цим метою статті є обґрунтування напрямів удосконалення нормативно-правової бази фінансового забезпечення якості педагогічної діяльності в системі вищої освіти в Україні в сучасних умовах. У ході дослідження на основі літературного узагальнення визначено основні показники ефективності педагогічної діяльності у вищій школі та недоліки нормативно-законодавчої бази її фінансового забезпечення. На основі факторного аналізу та показників ефективності за 2000—2019 роки встановлено пріоритизацію факторів визначення ефективності педагогічної діяльності. З використанням тесту Гренжера обґрунтовані характер і сила впливу джерел фінансування на фактори ефективності педагогічної діяльності у вищій освіті. Використовуючи метод авторегресії, розроблено векторні авторегресійні моделі впливу фінансового забезпечення на ефективність педагогічної. Аргументовано особливості впливу джерел фінансування освіти на фактори визначення ефективності педагогічної діяльності. За допомогою засобів структурно-логічного моделювання запропоновано модель удосконалення нормативно-правової бази регламентації якості вищої освіти з рахуванням характеру впливу рівня фінансового забезпечення на ефективність педагогічної діяльності. Запропонована в дослідженні модель ґрунтується на регламентації в основних освітніх нормативно-правових актах введення принципів і засад моделі фінансування педагогічної діяльності з використанням показників performance-based funding. Отримані результати теоретико-емпіричного дослідження мають наукову цінність і прикладний характер. Практична реалізація запропонованих заходів слугуватиме основою для формування гідної та прогресивної правової основи для провадження ефективної моделі фінансування педагогічної діяльності. Яка, у свою чергу, сприятиме підвищенню якості вищої освіти в Україні, стимулюватиме вищі навчальні заклади до формування нової моделі поведінки — якість і результативність перед усім.

Ключові слова: Україна, фінансове забезпечення, фінансові ресурси, педагогічна діяльність, освітні законодавчо-нормативні акти, вища освіта.

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ФИНАНСОВО-ПРАВОВОЕ ОБЕСПЕЧЕНИЕ ЭФФЕКТИВНОСТИ ПЕДАГОГИЧЕСКОЙ ДЕЯТЕЛЬНОСТИ В СИСТЕМЕ ВЫСШЕГО ОБРАЗОВАНИЯ УКРАИНЫ

Аннотация. В связи с низким уровнем конкурентоспособности образования Украины в глобальном образовательном пространстве, обусловленным неэффективностью модели финансового обеспечения педагогической деятельности в системе высшего образования, актуализируется вопрос о совершенствовании нормативно-правовой базы финансирования педагогической деятельности. В связи с этим целью данной статьи стало обоснование направлений к совершенствованию нормативно-правовой базы финансового обеспечения качества педагогической деятельности в системе высшего образования Украины в современных условиях. Используя метод авторегрессии, разработаны векторные авторегрессионные модели влияния финансового обеспечения на эффективность педагогической. С помощью средств структурно-логического моделирования предложена модель совершенствования нормативно-правовой базы регламентации качества высшего образования с учетом характера влияния уровня финансового обеспечения на эффективность педагогической деятельности. Практическая реализация предложенных мероприятий будет служить основой для формирования достойной и прогрессивной правовой основы обеспечения эффективной модели финансирования педагогической деятельности.

Ключевые слова: Украина, финансовое обеспечение, финансовые ресурсы, педагогическая деятельность, образовательные законодательно-нормативные акты, высшее образование.

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Introduction. To get high-quality higher education by citizens of Ukraine and ensuring an effective pedagogical process in the framework of the mandatory state standard is one of the main social guarantees in accordance with current Ukrainian legislation [1—3]. Effective pedagogical activity is a catalyst for social development. One of the key factors in ensuring the effectiveness of pedagogical activity in higher education as in other countries and in Ukraine so is the amount of funding. The level of financing for education in 2018 in Ukraine is less than 5 % of GDP, and science is less than 1 % of GDP, which is significantly behind the level of European countries [4].

The need to adapt to the lack of resources along with the opportunity to earn has led to an increase in number of institutions of higher education in the country. Most of them are former institutes and technical schools, which attracted applicants with the opportunity to get a higher education, not considering quality. As a result, Ukraine is far behind developed countries in terms of the quality of education and the contribution of scientific and technological progress to economic

growth. According to the Overall U21 2019 Ranking, Ukraine takes 38th place (45,1) in the world between 50 countries in the quality and effectiveness of the pedagogical process in higher education [5]. Whereas in 2012 it took 25th place (58,6) [6]. At the same time, it should be noted that Ukraine is out of 100 countries according to the Human Development Index 2018 is 88th. Significantly behind other countries of Eastern Europe, as for example, Kazakhstan is at 58, Belarus is at 53, Russia is at 49 [7]. It should also be noted that the effectiveness of pedagogical activity is not only an educational mission but also aimed to realize the scientific activity of higher educational institutions. The number of submissions in peer-reviewed academic journals, their citation, and derivative indicators is accepted by most countries as the main criteria of the effectiveness of science in universities. Although Ukraine takes 42nd place in the world in the number of scientific publications for 1996—2018, a negative correlation is observed between the number of publications and the number of citations [8]. This fact shows a low level of quality leaving publication activity in pedagogical activity.

In order to increase the effectiveness of pedagogical activity, attempts were made to improve the legal framework of a finding of higher education. In 2018 formulaic approach for the distribution of budget funds for higher education was introduced, provided by paragraph 46 of the Budget Code of Ukraine (BCU) [9]. At the same time, according to item 7, part 1 of article 87 of the Budget Code [9] the government spending of Ukraine's State budget includes the costs to higher education (the payments for the training of specialists, scientific and scientific-pedagogical staff according to state orders of higher education institutions of III-IV levels of accreditation (universities, academies, institutes). The rules on government procurement are also contained in the Law of Ukraine «On Higher Education» (Articles 13, 14, 71—73, etc.) [3]. In addition, there is a separate Law of Ukraine «On forming and placing a state order on the training of specialists, scientific, academic and labor force, continuous training and retraining». There is every reason to be sure in practice, the key will be the new rule of the Budget Code, which has the highest legal force and is the core for the use of budget funds. Moreover, there is a norm of Art. 95 of the Constitution of Ukraine [10] according to which «only the law on the State Budget of Ukraine determines any state expenditures on social needs, the value and target direction of these expenses». It should be noted that in the State Budget of Ukraine for 2019 about 9,8 billion UAH has planned to the development of science [11]. Which has been at 18 % more than the level of the previous year. But this level of financing is contrary to the norms of the Decision of the Board of the Ministry of Education and Science of Ukraine regulating the financing of scientific and technical activities at least 1,7 % of GDP [12]. Based on the above, at the current stage of the development of pedagogical activity in higher education, creating a new financing model is very relevant. That would allow effective using of very limited budget funds. Therefore, the formation and improvement of the legal framework financing of pedagogical activities in the field of higher education in Ukraine in accordance with European standards is one of the priorities of the activities of both the higher authorities in the field of education and the higher education institutions.

Analysis and statement of the research problem. The conceptual framework for financing the effectiveness of pedagogical activities in Ukraine is reflected in the educational legislation of Ukraine and the BKU (State National Education program [13], National Doctrine of Education Development [1], National Strategy [14]) and now requires only several updates in accordance with the requirements of the time. However, along with the declaration of many progressive norms for the development of education in these papers, current Law on Education and special laws «On Vocational Education» [15], «On Adult Education» [16] (the except of the new Law of Ukraine «On Higher Education» [3]) have not formed the basis for their achievement. Therefore, require radical updating and improvement.

In the literature, many researches show that knowledge has been the most important leading factor and the driving force of growth and economic performance of countries over the past three decades. So, universities and research organizations have become more influential than ever before on the economic competitiveness of individual economies in the context of globalization [17]. The

countries with an expanded system of higher education with higher levels of investment in research and development activities have higher potential to grow faster in a globalized knowledge economy [18]. Higher education expenditure is defined as the total amount of money or funds allocated from public and private sector budgets for higher education [19]. There are four different methods to finance higher education in developed and developing countries. In the first method, higher education is financed by using public resources. However, in the second method, it is financed by tuition fees. The third method to finance higher education is using private resources and university-industry collaboration is the last method to finance higher education [20].

Various successful approaches to the models of the distribution of budget financing for pedagogical activity have been using in practice nowadays [17; 19; 20]. In particular, this is the conclusion to an agreement between the university and the Government according to which the Government provides funding with an account of results of educational and scientific activities and the universities assume certain obligations. Another option, which is based on partial funding of higher education institutions according to the results of their activities. This option was accounted in the preliminary draft of the Ministry of Education and Science Ukraine, which was widely discussed in 2016 [21]. Moreover, as world practice shows the amount of basic fundings should be calculated using the formula taking into account: the key parameters of expenses, the effectiveness of pedagogical activities and the amount of basic funding for the previous period. It is close enough to the norms of the Budget Code [9]. But in general, the new standards adopted in the BKU are closer to another common model are based on performance indicators and that has been using in many European countries and the United States. N. Hillman noted that performance-based financing models are suitable for a simple system where goals are uniquely set and results are easily measured. And according to his point of view, the effectiveness of pedagogical activity in higher education is a more complex system and cannot be estimated for example by the number of students. It should include quality assessment indicators [22]. Therefore, the financing system should be based on a system of performance indicators, the quality of the pedagogical activity, and also take into account the effectiveness of the funding source. But as scientists have noted, that despite the insufficient level of funding for pedagogical activity in Ukraine the problems of ineffectiveness pedagogical activity is not only in the quantitative volumes of financing but in the mechanisms for the distribution of these resources [4]. Therefore, the aim of this study is to substantiate the directions to improve the legal framework of financing the quality of pedagogical activity in higher education in Ukraine in modern conditions.

Results of a research study. Models for assessing the impact of the level of financial support to the effectiveness of pedagogical activity in higher education.

In this study, financing is the volume of financial resources provided free of charge to higher education institutions from the state budget (S1), local budgets (S2), legal entities and individuals (S3), international programs, projects and grants (S4). The differentiation of sources of funding depends could differently influences the effectiveness of pedagogical activity in higher education in Ukraine, which forms the hypothesis of the study. The study was based on data of 20 universities of Ukraine with different profiles (multidisciplinary, pedagogical, economic, legal, technical) and with different geographical affiliations for ensuring the universality of the results. The list of the universities contained: Taras Shevchenko National University of Kyiv, V. N. Karazin Kharkiv National University, Simon Kuznets Kharkiv National University of Economics, Kharkiv National University of Radio Electronics, Academy of the State Penitentiary Service, National University of «Chernihiv Collegium» Taras Shevchenko, Chernihiv Institute of Information, Business and Law, Chernihiv National University of Technology, Ternopil National Economic University, Ternopil national pedagogical university, Ternopil Ivan Puluj National Technical University, Sumy State Pedagogical University named after AS Makarenko, Sumy State University, Cherkasy State Technological University, Bohdan Khmelnytsky National University of Cherkasy, Kherson State Agricultural University, Kherson National Technical University, Kharkiv State University of Food

Technology and Trade, National university of civil defence of Ukraine and National University of Pharmacy.

The statistical information was compiled using official data of volumes of financing (S1—S4) for universities (I1-I20) and performance indicators of 386 professors of these universities (X1—X13) for the 2014/2015—2018/2019 educational years. The following indicators were used as indicators of the effectiveness of pedagogical activity (*Table 1*).

Table 1

The system of indicators of the effectiveness of pedagogical activity in higher education

Indicators	Symbol
Doctoral degree	X1
Ph. D. degree	X2
Number of publications in the journals of Scopus, WoS for over the past 5 years	X3
Number of published monographs for over the past 5 years	X4
Number of published textbooks, training manual with the stamp of MON for over the past 5 years	X5
Number of international internships, certificate of upgrading the qualifications over the past 5 years	X6
Number of the thesis at international conferences over the past 5 years	X7
Number of postgraduates with Ph. D. for over the past 5 years	X8
Number of postgraduates with D. Sc. for over the past 5 years	X9
Number of certificates of I-III degrees in students scientific competitions for over the past 5 years	X10
Conformity to licensing requirements	X11
Rate of quality of students performance for the last academic year, %	X12
Rate of employment of graduates of the department according to specialty to the results of the last graduation, %	X13

Source: from the author.

The choice of indicators is due to the fact that the effectiveness of pedagogical activity is determined by the productivity of the teachers (indicators X1—X11) and the quality of student training (indicators X12—X13). Questions X1—X2, X11 suggest a binary assessment: 1, corresponding to the answer «Yes», and 0, corresponding to the answer «No»; questions X3—X10, X12—X13 — quantitative assessment. The statistical base on the effectiveness of pedagogical activity was formed on the basis of monitoring reports on the research work of teachers and individual plans, compliance with licensing requirements, semester student reports for the 2014/2015—2018/2019 academic year.

Representativeness of the proposed list of indicators to assess the effectiveness of pedagogical activity was confirmed by factor analysis, the rate of factorization — 86,4 % (with the necessary level of 80 % [23]). As a result of factor analysis, the structure of indicators for characterizing the effectiveness of pedagogical activity was also determined (*Table 2*).

Table 2

Factors-indicators of the effectiveness of pedagogical activities

Factor	Indicators	Dispersion (%)
Factor of scientific potential (<i>F1</i>)	X1-X2, X8-X9, X11	38,4
Factor of publication activity (<i>F2</i>)	X3-X5	26,7
Factor of student activity (<i>F3</i>)	X10, X12-X13	11,9
Factor of international activity (<i>F4</i>)	X6-X7	9,4
Total dispersion, %		86,4

Source: from the author.

According to the Kaiser criterion, the following factors have been identified that determine the effectiveness of pedagogical activities:

1) The factor of scientific potential was a combined of indicators of the availability of an academic degree, number of graduate students with Ph. D. and D. Sc, compliance with licensing requirements. This factor influences the most to the effectiveness of pedagogical activity — 38,4%

of dispersion. This can be explained by increasing requirements for teachers regarding the availability of a degree and compliance with licensing conditions.

2) The factor of publication activity was described by the number of publications: articles, monographs, textbooks, training manuals. Dispersion is 26,7 %.

3) The student activity factor characterizes the effectiveness of pedagogical activity from the side of student performance: winning in scientific competitions, rate of student performance and graduates employment.

4) The factor of international activity — is an integral indicator of the number of international internships, certificates of upgrading the qualifications, thesis at international conferences.

To build a model of the influence of the level of financing to the effectiveness of pedagogical activity in higher education, Model of vector autoregression of the form [24] was used.

$$Y_t = A(L)Y_{t-1} + B(L)Z_t + U_t \quad (1)$$

where Y_t — vector of endogenous variables;

Z_t — vector of exogenous variables;

$A(L), B(L)$ — matrices of lag operators;

U_t — vector of random errors.

The vector of endogenous variables takes the form $Y_t = [F1t, F2t, F3t, F4t]$, where $F1t, F2t, F3t, F4t$ are the values of the corresponding factors (*Table 2*) were calculated in the Statistica 10,0 program; vector of exogenous variables — $Z_t = 0$. All of the variables were identified as endogenous as a result of the examination for the exclusion of lags. For all indicators, there is a lag, which corresponds to a statistically significant coefficient in the lag variable. The statistical significance of the coefficients was estimated by p-value. The models were built in such a way to estimate the influence of funding sources (S1—S4) to the factors of the effectiveness of pedagogical activity (F1—F4). So the indicators F1—F4 were the dependent variables and the S1—S4 were independent variables.

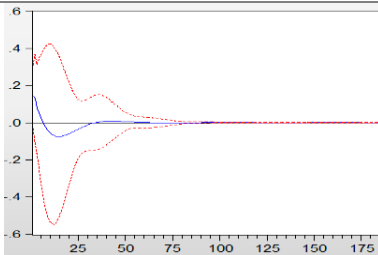
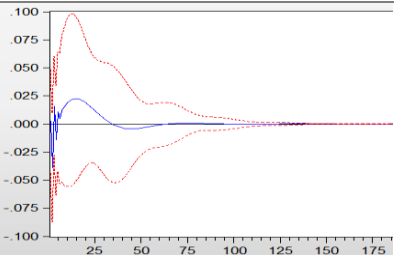
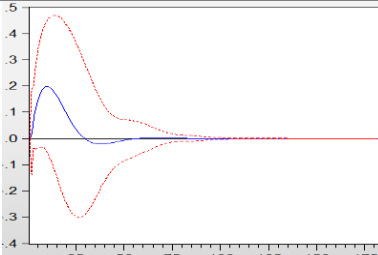
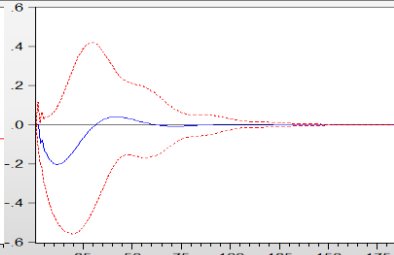
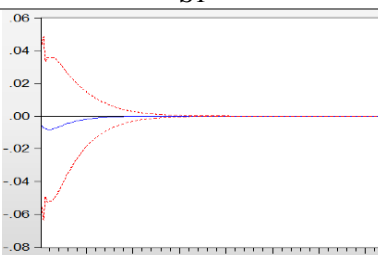
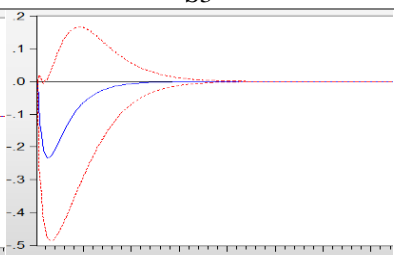
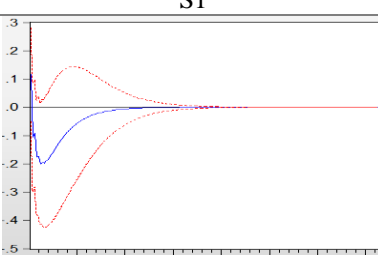
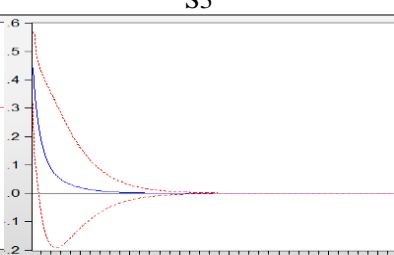
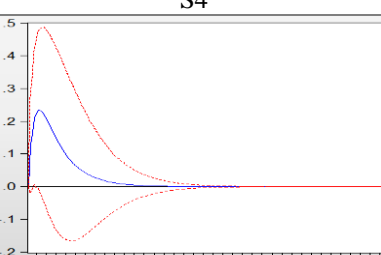
The use of the autoregressive model is due to the fact that the dependent indicators considered in the model are auto correlated. This excludes the possibility of using regression analysis. In addition, the autoregressive model allows taking into account the lag factor when modeling the influence of independent variables on the resulting indicator.

The causal relationships between the variables have been verified by the Granger test. They indicated the insignificant effect of financing from local budgets to the effectiveness of pedagogical activity (factors F1—F4). It can be explained by the underdevelopment of this source of funding. The lowest probability of rejecting the hypothesis about the insignificance of influence (Prob. = 0,0001) has been financing by individuals and legal entities due to its greatest impact on the effectiveness of the pedagogical activity. Financing from international programs, projects and grants have a statistically significant effect on the factor of international activity. The statistically significant vector autoregressive models and response graphs of the dependent variable constructed in E Views 10,0 are shown in *Table. 3*.

Our results have shown a significant impact on the level of financing to the effectiveness of pedagogical activity in higher education in Ukraine. The elasticity of the indicators were calculated according to the models (*Table 3*) indicated that the factor of scientific potential and factor of publication activity are the most depended on the volume of financing (E=2,02—2,94 % — with increase funding to 1 %, the indicators of scientific potential increase to 2,02—2,94 %) and (E = 1,04—1,86 %) accordingly. The factor of international activity is most affected by funding by international programs, projects and grants (EF4=2,08 %). The factor of student activity is the least dependent on the amount of funding.

Table 3

Vector autoregressive models of the impact of financing on the effectiveness
of pedagogical activity in higher education

Dependent variables	Pulse		
	S1	S3	S4
F1			-
	$F1=1,25 \times F1(-1)+1,06 \times S1-0,08$	$F1=0,86 \times F1(-1)+1,37 \times S3+0,67$	
F2			-
	$F2=0,98 \times F2(-1)+1,11 \times S1-0,34$	$F2=1,58 \times F2(-1)+0,58 \times S3+1,04$	
F3			-
	$F3=1,02 \times F3(-1)+1,01 \times S1-1,09$	$F3=1,13 \times F3(-1)+1,80 \times S3-1,02$	
F4			
	$F4=1,38 \times F4(-1)+0,98 \times S1+0,01$	$F4=1,28 \times F4(-1)+1,26 \times S3-0,91$	$F4=0,95 \times F4(-1)+1,19 \times S4+1,06$

Source: from the author.

The dependence of sources of financing the most influential is by the indicators of volumes of financing at the expense: of individuals and legal entities (EF1=2,94%; EF2=1,24%; EF3=0,37 %; EF4=0,93 %): of the state budget (EF1=2,02 %; EF2=1,04 %; EF3=0,59 %; EF4=0,87 %): of finance recourse of international programs, projects and grants (EF4=2,08 %).

Structural and logical scheme to improve the regulatory framework of pedagogical activity. Taking into account the results were obtained, a structural-logical model for improving the regulatory framework of pedagogical activity in Ukraine was created (Fig.).

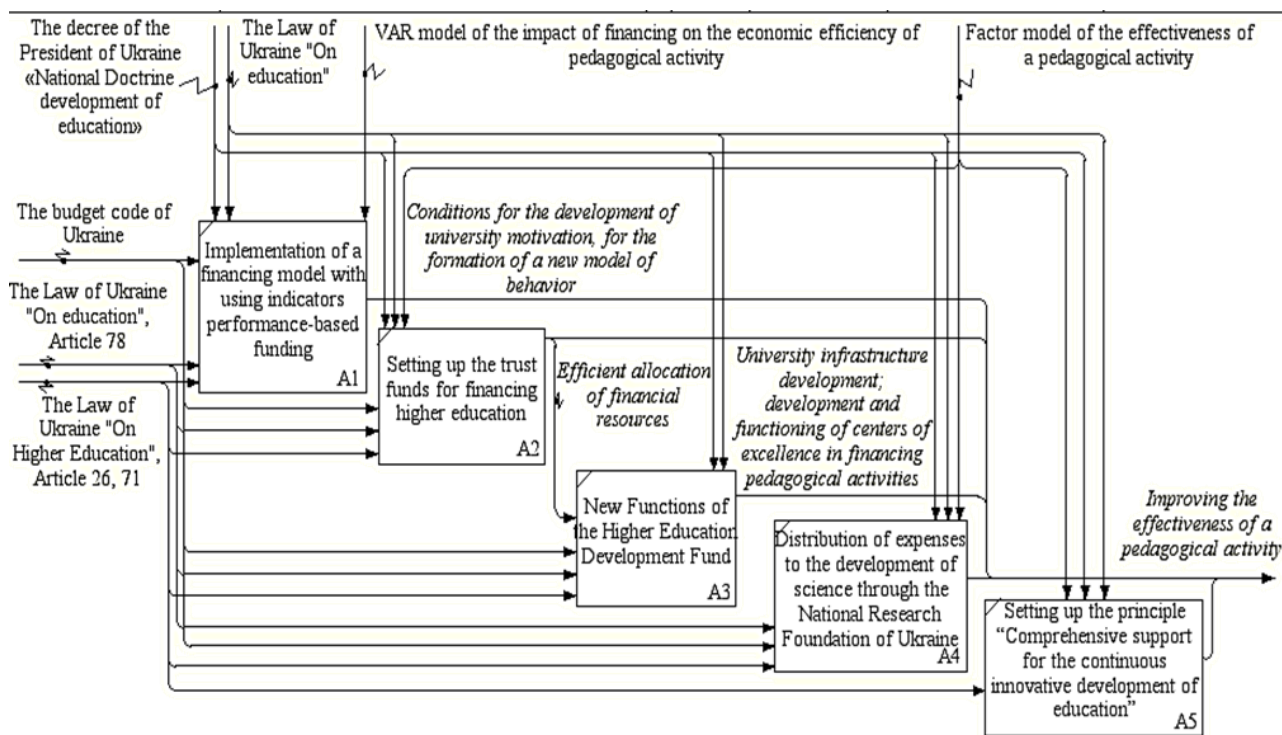


Fig. Structural and logical scheme to improve the regulatory framework of pedagogical activity in Ukraine

Source: from the author.

Based on the obtained results we can make the conclusion that, first of all, the effectiveness of pedagogical activities depends on the financing of legal entities and individuals. Therefore, in order to improve the quality of higher education in Ukraine, it is advisable to introduce the Art. Art. 78 and the Law of Ukraine «On Higher Education» p. 6. Art. 26 and Art. 71 changes based on the introduction of a financing model for pedagogical activities using performance-based funding indicators [25]. These indicators are widely implemented in the practice in most of the European countries. These improvements in the regulatory framework of pedagogical activity would create conditions for the development of motivation of universities in Ukraine and stimulate them to a new model of behavior based on a high-quality component of education.

Our research has shown the determining factors of the effectiveness of pedagogical activity in higher education in Ukraine are the factors of scientific potential and publication activity. It seems advisable to include in mentioned regulatory acts the thesis about the separation of all financial resources allocated for higher education in Ukraine into three trusted funds: General Financing Facility for Higher Education Institutions; Higher Education Developmental Fund; The social funding in higher education, where all expenses will be accumulated financing to scholarships and other social support guaranteed by the state.

We think that the Higher Education Development Fund to solve the problem of increasing the effectiveness of pedagogical activities. The projects in the following areas could be financed by this fund: 1) development of the infrastructure of higher educational institutions; 2) the development of centers of excellence in institutions of higher education; 3) projects to promote the development of higher education and science, including government funding for high-quality scientific journals of international recognition, innovative training programs for Ph. D., joint research projects. It should be noticed that the costs of the development fund should not be less than 10 % of the total costs for higher education. In order to ensure that these resources use in an efficient and transparent way, it must be distributed through the National Research Foundation of Ukraine. This direction is consistent with the National Doctrine development of education [1] where the principle of financing for the development of education has been declared: «Volumes of

financing for education and science should satisfy the needs of the individual and society in quality of education». This principle fully corresponds to the logic of the conceptual foundations for the development of pedagogical activity in Ukraine.

In addition, in Art. 6 «Fundamentals of government policy in the field of education and principles of educational activity» in The law of Ukraine on education [2], one of the clauses defines «providing the quality of education and the quality of educational activity». Relying on the ever-increasing importance of the effectiveness of pedagogical activity in modern conditions, we consider that Art. 6 should be supplemented with the following principle: «Comprehensive support for the continuous innovative development of education».

Conclusions. Thus, on the basis of the study in this article, the following conclusions can be drawn. In modern conditions, the effectiveness of pedagogical activities in higher education in Ukraine is crucial to ensure the sustainable socio-economic development of the country. And the development of which depends on the most of the financing from the state and individuals and legal entities. The determining factors in the effectiveness of pedagogical activity in higher education in Ukraine are, first of all, the scientific potential and publication activity, which directly affect the quality of the educational function within the framework of pedagogical activity. The priority of the factors of the effectiveness of pedagogical activity in higher education has been substantiated empirically. It becomes obvious that the improvement of the regulatory framework should be based on the introduction of a model for financing education using results-based financing indicators. This approach and all proposed changes in the legislative acts for the financing of higher education have certain risks that must be considered when deciding. But the greatest risks to the development of the higher education system today are the delay in making decisions and maintaining the current model, which does not correspond to socio-economic realities.

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