

heutzutage eine gründlich überlegte Staatspolitik im Bildungsbereich, die auf die prioritäre Entwicklung des Bildungsbereiches orientiert ist. Gerade solche Politik soll als Fundament der zukünftigen Wollergehen und nationalen Sicherheit des Landes verwendet werden, da das Bildungssystem aktiv auf die Entwicklung des materiellen und geistigen Herstellung wirken kann und damit die Hauptkraft der Gesellschaft, und zwar Betriebsarbeiter, ausbilden kann; sie beeinflusst aktiv die Prozesse der Umwandlungen der Sozialstruktur; sie ist der wichtigste Mittel der Übergabe den Jugendlichen der moralischen Werte, die von ihren Vorgängen entwickelt waren; sie formiert politische Ansichten der Menschen und bringt ihnen primäre Tätigkeitsfertigkeiten bei; sie entwickelt bei ihnen die Grundlagen der politischen und rechtlichen Kultur.

Also, die Sicherheit des Bildungsraumes ist ein Bestandteil der ganzen nationalen Sicherheit, der Zustand der Sicherheit, der stabilen Funktionieren und Entwicklung der ganzen strukturfunktionellen Organisationen; Möglichkeit alle negativen Einflüsse von innerlichen und äußerlichen Gefahren auszuschalten und zu überwinden; Förderung der positiven Tendenzen der Entwicklung von allen staatlichen, gesellschaftlichen und Bildungsstrukturen unterstützt werden.

3.4. Research for educational and scientific activity of higher education institutions in order to ensure their economic safety

In today's conditions, the use of Balanced Scorecard (BSC), consisting of financial, client, organizational and component training and staff development, in the activities of higher education institutions is not widespread to a large extent due to a number of circumstances, in particular:

- universities due to subjective features of functioning can be considered as a business entity operating in a risk and uncertainty and as an important element of the socio-economic system. This complicates the process of perceiving the set of criteria built in the basis of the BSC as being oriented only to obtaining an economic effect from the activities of the higher education institutions without taking into account the possible social effect of improving the performance of higher education;

- in the practice of foreign universities there is no example of the use of BSC, which, taking into account Ukraine's European strategic priorities, makes it impossible to achieve benchmark results in the future, which can be indicators of the performance of the leading universities of the EU or the world in general;

- due to features of the formation of Balanced Scorecard of economic entities (as one of the tools of strategic management), in today's conditions, it is rather difficult to achieve consistency (gradual balancing) of all the components of the strategy of higher education activities because of the existence of significant

fluctuations in the world market due to rapid development of information technology, which is reflected in the market of educational services and motivates universities to make permanent adjustments of educational programs, taking into account the necessity of labor market needs, economic demands and employers harmonization.

The main aspects of the formation of Balanced Scorecard within the framework of strategic management are reviewed in the papers^{288, 289, 290}, the possibility of adapting the BSC to the needs of the higher education institutions is clarified in the works^{291, 292}.

Taking into account significant scientific developments on the subject of the study²⁹³, it can be noted that under present conditions there is no comprehensive justification of aspects related to the use of BSC, adapted to the needs of higher education, while taking into account the possibility of developing measures for ensuring their economic security, state interaction, higher education institutions and employers in the labor market.

An important aspect in increasing the volume of work with the greatest positive impact on the effectiveness of internal processes (labor productivity of scientific and pedagogical employee (SPE) in its normalization) and, consequently, the effectiveness of the implementation of financial and client strategies is to determine the degree of such impact, with the prospect of ensuring the economic security of higher education institutions, which defined the purpose of this article. Taking into account the essence of economic security (it is the main component of national security and in accordance with the Methodological Recommendations for Calculating the Level of Economic Security of Ukraine, approved by the Ministry of Economic Development and Trade of Ukraine, dated October 29, 2013, No. 1277²⁹⁴, represents the "state of the national economy, which makes it possible to maintain resistance to internal and external threats, provide high competitiveness in the global economic environment and characterize the ability of the national economy to achieve sustainable and balanced growth") and the role of higher education

²⁸⁸Kaplan R. S. *The Strategy Focused Organization* / R. S. Kaplan, D. P. Norton. – Boston: HBS Press, 2001.

²⁸⁹Kaplan R. S. *The Balanced Scorecard – Measures that Drive Performance* / R. S. Kaplan, D. P. Norton. Retrieved from: <https://hbr.org/2005/07/the-balanced-scorecard-measures-that-drive-performance>.

²⁹⁰Каплан Р. Стратегические карты. Трансформация нематериальных активов в материальные результаты / Р. Каплан, Д. Нортон; Пер. с англ. – М.: ЗАО «Олимп-бизнес», 2005. – 512 с.

²⁹¹Бреус С. В. Використання збалансованої системи показників у діяльності вищих навчальних закладів / С. В. Бреус, С. Б. Хаустова // *Актуальні проблеми економіки*. – 2016. – № 9 (183). – С. 109–116.

²⁹²Грищенко І. М. Збалансована система показників ВНЗ: від стратегії до показників роботи структурного підрозділу / І. М. Грищенко, С. В. Бреус, С. Б. Хаустова // *Вісник Київського національного університету технологій та дизайну. Серія «Економічні науки»*. – 2016. – № 2 (97). – С. 43–62.

²⁹³Мартинюк В. П. Економічна безпека вищих навчальних закладів в Україні: передумови оцінювання [Електронний ресурс] / В. П. Мартинюк // *Економіка Менеджмент Підприємництво*. – 2013. – № 25 (II). – Режим доступу: <http://eme.ucoz.ua/pdf/252/24.pdf>.

²⁹⁴29.10.2013 № 1277 [Електронний ресурс]. – Режим доступу: <http://www.me.gov.ua/Documents/List?lang=uk-UA&tag=MetodichniRekomendatsii>

institutions to provide sustainable economic growth, greater attention should be paid to developing measures that will improve their financial and economic indicators. This can be achieved, in particular, by balancing income and expense articles of higher education institutions, in particular by using Balanced Scorecard adapted to the needs of higher education institutions to implement the strategy of "reduction of total costs".

The offer of educational services for "reduction of total costs" or with the best value for money is associated with a high level of price competition and the massnature of the demand for educational services. Taking into account one of the main conditions for implementing the strategy "reduction of total costs" (continuous improvement of the quality of the organization of the educational process by reducing costs and efficient use of resources), the analysis of labor productivity (time expenditures by type of work) of SPE can be realized according to the performance indicators of universities.

Analysis of the real time expenditures structure (for some types of work - time costs) of SPE was performed using the MS EXEL table processor as a result of the use of the ABC analysis (its modified version, which involves the distribution of indicators into four groups - ABCD). The results obtained in the analysis process (Table 3.4) reflect the distribution of different types of work according to the following groups: A - the most labor-intensive types of work that determine the main result of the organization's activities, the content and quality of internal processes and have an rising share of up to 50%; B - types of works that can play no less significant role in the implementation of strategic and current tasks and occupy not less than 2% each of the total workload of works; C - types of work with a labor intensity of less than 2%, accounting for an increasing proportion of no more than 10% of working time; D - types of work with a labor intensity of less than 1%, accounting for an increasing proportion of 5% of working time.

The performed calculations show that only 18 types of works from 96 which can be performed by the SPE, have a share above 1% each, and together make up 87.2% of the total time spent by the SPE of the whole university. At the same time, practically 1/5 (18.8%) of the working time of the SPE is spent on the organization (preparation) of the educational process, which is fully justified in the context of implementing the strategy "reduction of total costs". Thus, the best ratio of "price-quality" in providing educational services under the strategy of "reduction of total costs" is ensured: first of all, due to the quality and control of the complexity of such work as preparation for classroom classes (the coefficient in the regression equation is 0.81) All other types of works included in the regression model are characterized by a relatively small influence on the total time expenditures (coefficient 0.05-0.16), and therefore can be considered as secondary factors. At the same time, reducing the

time spent on reading lectures by 1% will increase the productivity of SPE by 0.066%.

Table 3.4

ABC (ABCD) - analysis of the structure of time expenditures by type of work of the university's SPE and certain specialties (educational programs of related specialties)

№	Types of SPE works included to the group A and B (internal process or aspect of work)	Structures of time expenditures by types of work of SPE by specialty (educational programs of related specialties),%									
		Share of time according to the types of work of the university's SPE	The accumulated share of time according to the types of work of SPE	Chemical technology and engineering. Biotechnology and Bioengineering. Pharmacy	Light industry technology	Design	Marketing. Economy. Accounting and taxation. Finance, banking and insurance	Computer Science and Information Technology. Automation and Computer Integrated Technology	Finance, Banking and Insurance	Management	Marketing. Economics
1	2	3	4	5	6	7	8	9	10	11	12
1.	Preparation for lectures, practical and seminar classes (methodical)	18,8	18,8	16,2	18,4	20,5	17,9	18,7	13,7	11,3	15,4
2.	Holding practical classes (educational)	17,9	36,7	-	10,1	29,3	24	6,0	13,4	12,0	10,8
3	Mentorship on the educational disciplines (educational)	7,9	44,6	7,0	7,5	7,9	8,9	8,0	11,0	13,4	7,7
4.	Conducting lectures (educational)	6,6	51,2	5,7	8,8	-	5,1	8,8	7,1	4,8	8,6
5	Conducting laboratory classes (educational)	6,3	57,5	10,2	9,1	-	-	15,8	-	-	4,7
6	Guiding theses (projects) (educational)	5,4	62,9	6,6	-	4,4	5,9	8,0	5,2	9,8	-
7	Preparation of the electronic educational- methodical complex on discipline (methodical)	3,7	66,6	3,6	-	7,2	-	-	-	-	-
8	Conducting semester control (educational)	3,1	69,7	-	-	-	-	-	-	-	-
9	Guiding educational and work experience internship (educational)	2,5	72,2	-	-	-	-	-	-	-	-
10	Publication of articles (in professional journals)	2,4	74,6	-	-	-	-	-	-	-	15,7

Continuation of Table 3.4

1	2	3	4	5	6	7	8	9	10	11	12
11	Verification: control, calculation and graphic works, analytical reviews, translations, abstracts	2,1	76,7	-		-	-		-		-
12	Guiding and evaluating of course paper, projects (educational)	1,9	78,6	-		-	-		-		-
13	Publications: monograph, defining dictionary, reference book (scientific)	1,8	80,4	-		-	-		-		-
14	Preparation and publication of textbook (manual) (scientific)	1,7	82,1	-		-	-		-		
15	Scientific research according to the international program, state program, on the subject of contracts; obtaining international grants (scientific)	1,4	83,5	9,0		-	-		-		
16	Guiding student scientific works (scientific)	1,4	84,9	-		-	-		-		
17	Publishing article in foreign scientific editions (scientific)	1,2	86,1	-		-	-		-		
18	Thesis defense (scientific)	1,1	87,2	3,7		-	-		-		6,7

Further research (for the sake of complex calculations facilitating the software product Statistika was used) is based on the multiple regression to determine meaningful regressors. In the future, a model of SPE time expenditures was constructed (the efficiency of the administrative-service structures involved in providing and organizing internal processes of the university was not taken into account) for the specialties that are in demand in the labor market²⁹⁵ and are promising in the context of the transition to a knowledge economy.

The results of the regression analysis performed on the basis of multiple regression for the determination of significant regressors in the model of SPE time expenditures by types of works(*) are given in the formula:

$$Y = 0.810847 \times X2 + 0.160941 \times X7 + 0.114316 \times X17 (1) \\ + 0,056014 \times X12 - 0,065677 \times X5$$

where Y (i) is the duration of the work of the i-th type.

*According to the results of the model among the most significant types of works to provide effectiveness (quality) of internal processes were the duration of preparation for lectures and practical classes, X2; conducting lectures, X5 (inverse link); guiding educational and work experience internship, X7; preparation and publication of the textbook, X12; publishing of article in foreign scientific publications, organization and conducting of scientific and methodological seminars with the participation of teaching staff, representatives of enterprises and foreign firms.

²⁹⁵Самі затребувані професії 2017 в Європі. Яку спеціальність обрати в 2017 році? [Електронний ресурс]. – Режим доступу: <http://2017pik.pp.ua/novini-2017/507-sam-zatrebuvan-profesyi-2017-v-yevrop.-yaku-specalnst-obrati-v-2017-roc.html>.

Taking into account the results of conducted ABC (ABCD) - analysis and regression analysis of time expenditures by types of works SPE balance of indicators of internal processes with the indicators of financial and client components is individual in nature for a particular educational program implemented by certain university, depending on the planned and actual financial indicators of its activities, level of staffing, available information technology in the management and implementation of the educational process, and also contributes to the formation of a certain difference between the structure of the time spent by certain groups of specialties and structure of expenditures as a whole at higher education institutions (Table1).

Taking into account the requirements of internal processes, based on the data of the SPE rating, which are involved in the implementation of certain groups of educational programs, the types of works that determine the level of development and training are identified. On the basis of these data, an optimistic scenario of the indicator influence on the effectiveness of internal processes and on the implementation of the component of the development and training strategy of the SPE is developed. On the basis of this scenario regression analysis is performed on the basis of multiple regression for the determination of significant regressors in the model of time expenditures of SPE which are related with development and studying (formula2).

$$Y = 1,113464 \times X1 + 0,246725 \times X7 - 0,200039 \times X5 - 0,198496 \times X14, \quad (2)$$

where Y (i) - total time spent by SPE; X 1 - time spent on preparation for lectures, practical, seminars and individual classes - direct communication; X 7 - time spent on conducting research work according to the international program, according to the state program, on the subject of contracts, receiving international programs grants - direct link; X5 - the cost of writing and publishing an article in foreign scientific journals is an inverse link; X14 - time expenditures for the preparation and publication of methodological materials on teaching disciplines in a foreign language, as well as republication of teaching materials in a foreign language - an inverse link.

In this model attention is drawn to the time indicator spent on preparing for all types of classroom activities, which, as a factor in the total time expenditures of the SPE, involved into both regression models (formula 1) and (formula 2).

Unlike existing methods, **the advantage of proposed approach** to the analysis of labor productivity is as follows: there is a possibility of reducing current expenses, creating new sources of income, as well as increasing them, mainly due to the use of intellectual resources (human, informational, organizational); contributes to solving

the tasks of strategic analysis; promotion of BSC using in education institutions (previously it was distributed in corporate organizations).

In general, in view of the above, it should be noted that it is reasonable to use indicators controlling their calculation and realization. The practical use of Balanced Scorecard adapted to the higher education institutions needs will help to improve the functioning of universities, their competitiveness, places in domestic and international ratings, and as a result - prevent or at least eliminate the threats to its activities, increase its level of economic security and the economic security of the state and national security in general. The above determines the expediency of further research using developed approaches in formation of the development strategies of both higher education institutions and economic entities of different forms of ownership.

3.5. Information component of economic security of the higher education institutions

At present, higher education institutions (HEI) in Ukraine are negatively affected by the consequences of crises in the economy, the political and social spheres of the state. Under such conditions, the functioning of higher education institutions is influenced by both external and internal threats arising from the implementation of educational, scientific and economic activities.

The activities dedicated to organizing the system of economic security at a higher education institutions are to identify factors, phenomena or processes that may harm the HEI or negatively affect its functioning. Such factors are threats, and the system of economic security at a higher education institutions should be organized in order to prevent threats and respond to potential dangers in their own activities in advance.

The works of such scholars as I.S. Stetsiv²⁹⁶, L.P Snigir²⁹⁷, A.S Sosnin²⁹⁸, V.F Gaponenko²⁹⁹, V.P McMack³⁰⁰, O.A. Grunin³⁰¹, S.O. Grunin³⁰³, M.D. Glasny³⁰²,

²⁹⁶Стеців І. С. Економічна безпека ВНЗ: сутність та особливості планування / І. С. Стеців // Вісник Національного університету "Львівська політехніка". – 2010. – № 691: Менеджмент та підприємництво в Україні: етапи становлення і проблеми розвитку. – С. 218–222.

²⁹⁷Снігір Л. П. Класифікація загроз економічній безпеці вищого навчального закладу / Л. П. Снігір // Вісник Хмельницького національного університету. – 2015. – №5, Т. 1.

²⁹⁸Соснин А. С. Менеджмент безопасности предпринимательства А. С. Соснин, П. Я. Прыгунов. – Киев: Издательство Европейского университета, 2002. – 101 с.

²⁹⁹Гапоненко В. Ф. Экономическая безопасность предприятий. Подходы и принципы / В. Ф. Гапоненко, А. А. Беспалько, А. С. Власков. – М.: Издательство «Ось-89», 2007. – 111 с.

³⁰⁰Мак-Мак В. П. Служба безопасности предприятия / В. П. Мак-Мак. –М.: Баярд, 2003. – С. 11–12.

³⁰¹Грунин О. А. Экономическая безопасность организации / О. А. Грунин, С. О. Грунин. – СПб.: Питер, 2002. – 41 с.

³⁰²Гласный М. Д. Атмосфера угроз / М. Д. Гласный // Риск-менеджмент. – 2008. – № 7-8, июль-август. – 11 с.