



REVISTA INCLUSIONES

HOMENAJE A ROSA MARÍA VALLES RUIZ

Revista de Humanidades y Ciencias Sociales

Volumen 7 . Número Especial

Abril / Junio

2020

ISSN 0719-4706

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**KEY INDICATORS OF THE ECONOMIC ACTIVITY OF EDUCATIONAL INSTITUTIONS:
MODELING AND PROSPECTS**

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Fecha de Recepción: 09 de enero de 2020 – **Fecha Revisión:** 25 de enero de 2020

Fecha de Aceptación: 06 de marzo de 2020 – **Fecha de Publicación:** 01 de abril de 2020

Abstract

The results of activities in the field of education appear in the form of service and, as a rule, do not have a clearly expressed material form. The measurement of the economic activity of educational institutions requires a clear definition of the main categories and values necessary for its calculation. It is necessary to evaluate the economic activity and the rationality of the cost of resources for any purpose based on certain criteria. The article analyses the scientific literature on the problem of determining indicators of the economic activity of educational institutions. Based on an expert survey, the principles of building a system of indicators characterizing economic activity at a university have been defined, analytical support for the assessment of economic activity of university departments has been developed, and the sequence of determining the economic rating of departments of a higher education institution on the basis of the performance indicator has been presented.

Keywords

Educational institution – University – University department – Economic activity

Para Citar este Artículo:

Samylina, Yulia Nikolaevna; Kishko, Vladimir Arkadievich; Filinov, Vladimir Petrovich y Malysheva, Elena Nikolaevna. Key indicators of the economic activity of educational institutions: modeling and prospects. Revista Inclusiones Vol: 7 num Especial (2020): 01-14.

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Introduction

The importance of increasing the economic efficiency of the education system functioning is determined not only by its direct value to a person but also by the fact that the costs of the education system are investments with a subsequent return, which takes the form of an individual or public income. Individual returns continue throughout a person's life as their labor productivity increases. Since basic education allows people to be widely involved in the production process, wages help reduce inequality and increase the size of the middle class. The return on expenditure on education for society is manifested in an increase in labor productivity and aggregate macroeconomic indicators: GNP, GDP, national income, etc¹.

An important step should be the establishment of effective monitoring in the education system when calculating the economic efficiency of education – it is necessary to ensure the collection and use of quantitative measurements of all educational services provided in the country. Extensive statistics will subsequently become the basis for determining levels of economic efficiency².

In the economic literature, research and methodology for measuring the quantitative parameters of the economic return on education costs were started back in the 1960s by theorists of the human capital concept G. Becker and T. Schultz. Today, the technology of analyzing the costs and returns of investments in education has been developed in detail in the works of many scientists, including M. Woodhall, J. Mintzer, I. Mayburov, and others³.

The external effectiveness of education, which consists in influencing the sustainable development of society, depends on its internal effectiveness. It can be relatively independent and have their independent values. At the same time, it cannot be torn and the effectiveness of educational activities should be considered in the unity of the internal and external aspects⁴.

The logic of calculating the economic efficiency of educational activity requires a quantitative proportionality of costs in this area with their economic return. The specificity of this sphere of human activity makes it difficult to determine both the cost and return. The cost of education is always a specific amount. M.A. Lukashenko notes that this amount, as a rule, does not reflect all the funds spent by society on education. The total amount of private expenditures in the form of tuition fees is rarely reported in statistics. The amount of expenditures on education, such as payment by families for office supplies, textbooks, travel, and food, is difficult to calculate⁵.

¹ E. A. Hanushek y D. D. Kimko, "Schooling, labor-force quality, and the growth of nations", *American Economic Review* Vol: 90 num 5 (2000): 1184-1208.

² N. V. Vasilenko y A. Ya. Linkov, *Ekonomika obrazovaniya: uchebnik* (Moscow: INFRA-M, 2018).

³ A. P. Gorbunov; E. B. Gorlova y N. V. Maslennikova, *Teoriya i praktika upravleniya kachestvom obrazovaniya v Rossii: monografiya* (Moscow: Direkt-Media, 2016).

⁴ T. A. Konova; T. A. Konova y V. L. Nesterov, "Otsenka ekonomicheskoi effektivnosti investitsii v innovatsionnye obrazovatel'nye programmy vuzov", *Fundamentalnye issledovaniya* Vol: 11 num 4 (2012): 990-994.

⁵ M. A. Lukashenko, *Obrazovanie v usloviyakh rynka: kontseptsiya uchebnogo zavedeniya: monografiya* (Moscow: Vysshaya shkola, 2011).

According to A.Yu. Oshchepkova, the complexity of calculating returns in education is caused by the ambiguity of determining the very results of education. These results can be interpreted in different ways and not all of them can be represented by economic indicators⁶. Basically, the results of educational activities can be represented by any direct cost indicators, but they will always be indirect, since to some extent they reflect the role of education in improving the labor and production efficiency⁷.

Researchers consider obtaining surplus-value and product growth as a result of increasing the level of education and qualifications of employed workers as indirect indicators of the economic efficiency of education. This additional cost created by skilled labor, in their opinion, is the economic effect that society receives from the cost of education and training of skilled labor⁸. However, the calculation of this economic effect is complicated by the fact that it is difficult to distinguish the influence of the education factor on the growth of aggregate economic indicators⁹.

The analysis of methodological approaches to the assessment of the efficiency of a university has shown that the market conditions of economic management, the presence of a competitive environment in the field of education, as well as integration processes, force universities to function in the categories of efficiency and introduce adequate mechanisms and new innovative forms of management into educational and scientific practice. This can ensure the opportunities of universities to become equal participants in the market of educational services¹⁰. Summing up the analysis of scientific works on the research problem, it should be noted that today, new approaches to the management of educational institutions are scientifically substantiated, which are aimed at improving the quality of educational services¹¹. Attention is paid to accounting and cost control, calculation of the cost of paid educational services, and break-even calculation of educational activities¹².

⁶ A. Yu. Oshchepkov, "Chto vliyaet na otdachu ot obrazovaniya: mezhregionalnyi analiz", *Ekonomicheskii zhurnal VShE* Vol: 15 num 1 (2011): 34-49.

⁷ E. D. Novozhilov, "Opredelenie ekonomicheskoi effektivnosti obrazovaniya", *Ekonomika obrazovaniya* num 3 (2012): 55-62.

⁸ C. Barra y R. Zotti, "Managerial efficiency in higher education using individual versus aggregate level data: Does the choice of decision making units count?", *Managerial and Decision Economics* Vol: 37 num 2 (2016): 106-126.

⁹ J. Johnes; M. Portela y E. Thanassoulis, "Efficiency in education", *Journal of the Operational Research Society* num 68 (2017): 331-338; N. V. Filinova; V. P. Filinov; O. N. Pogodina; V. A. Lunev y E. V. Luneva, "The socio-economic foundations of the development of contemporary economic innovations", *Asian Social Science* Vol: 11 num 6 (2015): 150-160 y O. V. Rozhnova; Zh. A. Kevorkova; I. P. Komissarova; A. N. Mayorova y E. V. Luneva, "The role of trade in socio-economic development of crimea", *International Journal of Civil Engineering and Technology* num 9 Vol: 12 (2018): 48-54.

¹⁰ E. B. Gafforova y A. V. Karlovskii, "O podkhodakh k otsenke effektivnosti deyatelnosti vuzov", *Vestnik NGU. Seriya: Sotsialno-ekonomicheskie nauki* Vol: 9 num 3 (2009): 81-87.

¹¹ V. I. Savinkov y P. A. Baklanov, *Sotsialnaya otsenka kachestva i vostrebovannost obrazovaniya: uchebnoe posobie* (Moscow: Yurayt, 2018); M. S. Talwar y T. Kumar, "Total Quality Management in Higher Education", *University News* Vol: 48 num 1 (2010): 12-14 y B. Kristensen, "Has External Quality Assurance Actually Improved Quality in Higher Education Over the Course of 20 Years of the "Quality Revolution", *Quality in Higher Education* Vol: 16 num 2 (2010): 153-157.

¹² R. Maelah; A. M. Amir; A. Ahmad y S. M. Auzair, "Pricing for educational programs at institutes of higher learning", *International Journal Education Economics and Development* Vol: 3 num 3 (2012): 264-287; J. Hemsley-Brown y I. Oplatka, "Universities in a competitive global marketplace: a systematic review of the literature on higher education marketing", *International Journal of Public*

Methods have been developed for evaluating the economic efficiency of a university using cluster analysis, expert estimates, probability theory, mathematical statistics, and the applied programs MathCAD, Mat Lab, and Statistica¹³. Methods for assessing the competitiveness of educational institutions based on the technology of selecting competitiveness indicators have been improved, which allows increasing the competitiveness of specialists¹⁴.

According to researchers, the effectiveness of a university's functioning depends on the performance of its structural divisions, their contribution to the general financial flows of the institution, and the rationality of their use of the resources of the higher education institution¹⁵.

Thus, a university department, which is the main link providing educational activity and income generation by an educational institution, forms the main expenses of the educational process and occupies an important place in the system of managing the activity of the higher education institution.

There are practically no works related to assessing the economic efficiency of the activities of departments of higher education institutions. Moreover, there are no studies on the creation of analytical support for such an assessment. Therefore, certain economic levers should be developed to increase the efficiency of departments and universities as a whole that will help improve the financial and economic state of educational institutions and the stability of their functioning, as well as their analytical, organizational, and informational support.

The study aims to develop analytical support for assessing the economic efficiency of the functioning of university departments.

Research hypothesis: The use of analytical support for evaluating the effectiveness of a university department's functioning will allow its leadership to implement measures to improve the effectiveness of the educational institution as a whole by improving the efficiency and effectiveness of its departments' activities.

Based on the results of the study, it can be concluded that the goal set in the study was achieved.

Methods

The following research methods were used in the research:

Sector Management Vol: 19 num 4 (2006): 316-338 y M. Yakhov y K. Ulshafer, "Adapting the balanced scorecard and activity-based costing to higher education institutions", International Journal of Management in Education Vol: 6 num 3 (2012): 258-272.

¹³ D. I. Zinchenko y A. A. Egorov, "Modelirovanie effektivnosti rossiiskikh universitetov", Ekonomicheskii zhurnal VShE Vol: 23 num 1 (2019): 143-172 y O. V. Grigorash y A. I. Trubilin, Organizatsiya i otsenka raboty kafedry: Uchebnik (Krasnodar: KubGAU, 2017).

¹⁴ A. A. Stukalova, "Otsenka effektivnosti prodvizheniya obrazovatelnykh programm v usloviyakh vysokonkonkurentnogo rynke", Internet-zhurnal "Naukovedenie" Vol: 7 num 3 (2015). Available at: <http://naukovedenie.ru/PDF/182EVN315.pdf>

¹⁵ A. D. Kuzminskii, "Sovremennye podkhody v otsenke deyatelnosti kafedry", Sovet rektorov num 8 (2013): 35-40.

- the analysis of scientific literature on the problem of determining indicators of the economic activity of educational institutions;

- an expert survey aimed to determine a) the principles of constructing a system of indicators characterizing university economic activity; b) analytical support for assessing the economic activity of university departments; c) the sequence of determining the economic rating of university departments based on the indicator of performance.

Thirty-five experts, university professors, were invited to participate in the online expert survey.

Results

An important aspect of the problem is the selection of informative economic indicators that would provide an objective description of departments' contribution to the financial flows of the institution and the rational use of university resources by them.

As the experts noted, state universities are nonprofit organizations. Therefore, to assess the activities of their structural units, departments, it is necessary to identify indicators that consider the specifics of their activities.

According to the experts, it is advisable to adhere to five basic principles for constructing a system of indicators characterizing university economic activity (Table 1).

No.	Principles	%*
1	logical connection, allowing to combine internal and external, financial and non-financial indicators with the motivation of financing structures, consumers, and performers	91%
2	data reliability of all elements of the university's structure and directions of financial, material, and information flows	86%
3	compliance with legislation (national, regulatory, and methodological base of the educational sphere, as well as internal local acts)	80%
4	application of a unified methodological scheme and workflow system	71%

Note: compiled on the basis of the expert survey; * – percentage of expert mentions
Table 1

Principles of building a system of indicators characterizing university economic activity

Based on the expert survey, the following model is proposed for assessing the economic efficiency of university departments.

Since the implementation of educational activities by departments leads to expenses associated with the educational process and, at the same time, to the educational institution receiving a significant part of its income, it is advisable to use income and expense indicators for assessing and analyzing the effectiveness of their activities. The difference between the income and expenses of a department is the cash flow, to which its activities lead:

$$C_j = I_j - E_j \quad (1)$$

where C_j – indicator of cash flow of the j-th department;

I_j – income of the j-th department;

E_j – total expenses of the j -th department.

The use of the cash flow indicator of the department will provide the leadership of the educational institution with information on the performance of its structural divisions.

Determining the efficiency of using the resources of an educational institution is also necessary for the analysis and evaluation of the activities of its departments.

This, above all, applies to fixed assets used by departments in the implementation of their activities. Therefore, the experts also proposed using the indicator of the profitability of fixed assets to assess and analyze the effectiveness of university departments, which is calculated as the ratio of the cash flow of the department to the residual value of its fixed assets:

$$P_j = (I_j - B_j) / RV_j = C_j / RV_j \quad (2)$$

where P_j – profitability of fixed assets of the j -th department;

RV_j – residual value of fixed assets of the j -th department.

For each department, the value of its economic rating is determined on the basis of the performance indicator, which is calculated as the sum of standardized indicators of cash flow and profitability of fixed assets of the department, considering significance factors, determined based on expert assessment:

$$R_j = k_C \cdot (C_j / C_{max}) + k_P \cdot (P_j / P_{max}) \quad (3)$$

where R_j is the economic rating of the j -th department;

k_C and k_P – significance factors of cash flow indicators and profitability of fixed assets, determined based on expert assessment;

(C_j / C_{max}) – standardized indicator of cash flow of the j -th department;

C_j – indicator of cash flow of the j -th department;

C_{max} – maximum value of cash flow among all departments;

(P_j / P_{max}) – standardized indicator of fixed assets profitability of the j -th department;

P_j – indicator of the profitability of fixed assets of the j -th department;

P_{max} – maximum value of the profitability of fixed assets among all departments.

Departments are ranked in descending order of economic rating: a department has the highest rating with the maximum value of the indicator of the functioning effectiveness.

The sequence of determining the economic ranking of university departments based on the performance indicator is shown in Figure 1.

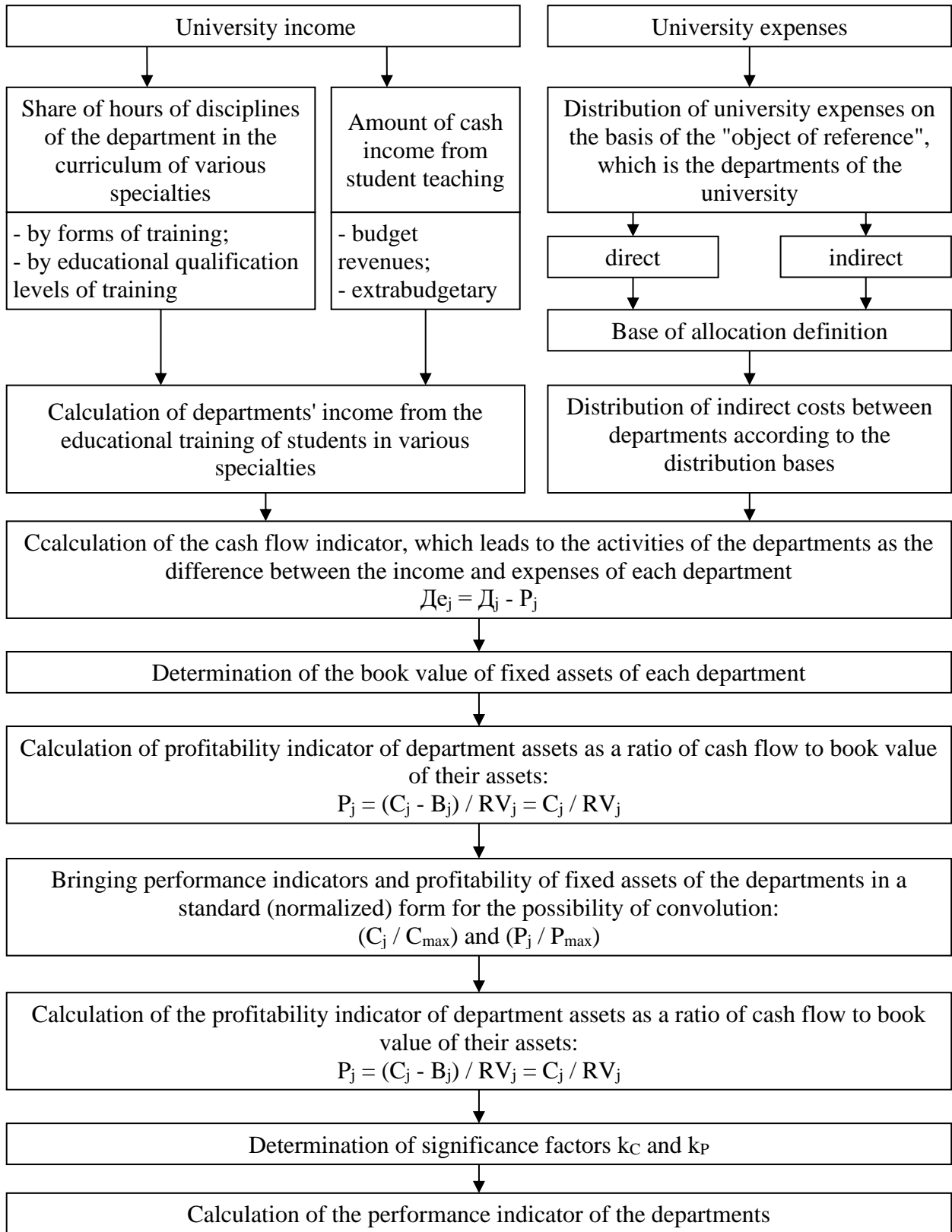


Figure 1

Sequence of determining the indicator of economic efficiency of university departments

Discussion

The profitability ratio of fixed assets reflects the efficiency of the use of resources invested in individual structural divisions from the position of management accounting and analysis. In addition to its advantages, which include the possibility of comparing the performance of a separate structural unit and the resources invested in it, the profitability indicator of fixed assets has certain disadvantages. Since it is a relative indicator, it does not allow assessing the importance of the existence of a separate structural unit for the organization as a whole. Using only this indicator to assess the economic efficiency of university departments can lead to the fact that managers will work mainly in the direction of reducing the cost of fixed assets invested in a particular department. Universities consist of structural units of different sizes, receiving different financial results and requiring different resources to carry out their activities, that is, some of the units reasonably require rather large costs for fixed assets, but at the same time, it is expected that their activities will generate corresponding income.

From this, it can be concluded that it is advisable to apply the indicator of the profitability of fixed assets of departments in combination with the absolute indicator in determining the efficiency of university departments. The relative rate of return on fixed assets is used in conjunction with the absolute indicator of profit to assess the structural units of profitable organizations. Since university departments are structural divisions of an institution, the activity of which is non-commercial, it is advisable to use the fixed assets profitability indicator together with the absolute cash flow indicator, which reflects the performance of each department.

The proposed indicators can be integral elements of the performance indicator of an educational institution's departments, based on which, the economic rating of the departments can be formed.

In order to calculate indicators and form an economic rating, it is necessary to determine the income of each department, calculate its costs and cash flows, and determine the value of fixed assets invested in each of them, as well as the significance coefficients of the components of the efficiency indicator, which can be determined on the basis of expert assessment, considering the specific conditions of the university's functioning and the goals set regarding the adoption of managerial decisions on the effectiveness of the use of university resources by its departments.

In order to determine the income of each department of a university, it is proposed to distribute the income of the educational institution in proportion to the specific weight of the number of hours of disciplines taught by the corresponding department in the curricula of various specialties.

The proportion of disciplines of each department in the curricula of various specialties is calculated by dividing the number of hours of disciplines of the corresponding department by the total amount of hours in the curriculum of the specialty.

Calculation of departments' income is carried out separately for bachelor, specialist, and master students, considering that training is carried out in various forms (full-time, part-time, distance).

The income of each department participating in educational and professional training of students is calculated by multiplying the specific gravity of the number of hours of disciplines by the total amount of income from the training of students of relevant specialties.

When calculating the income of departments, it is also considered that students are trained for both budgetary and extra-budgetary funds.

The experts proposed to include the budgetary income of the employees of the educational institution, the accruals on it, and utility bills. Budget funding for one student's tuition is calculated as a ratio of budget revenues to the total number of students studying on a budget basis.

Payment for student tuition on a contractual basis, that is, when payment is made at the expense of individuals and legal entities, was considered by the experts as extrabudgetary funds. Income from student learning is calculated as the product of the cost of training one student and the corresponding number of students.

To analyze university expenses, it is proposed to use their classification in accordance with the allocation of costs to certain direct and indirect objects, which are departments.

Direct expenses of departments include: salaries of the department faculty; accrual of salaries of the department faculty; acquisition of fixed assets in the department; maintenance and overhaul of fixed assets of departments; items and materials of the department; communication services of departments; business trips of the department staff.

Indirect expenses of departments include: salaries of administrative and management personnel; payroll charges for administrative and management staff; acquisition of fixed assets and long-term management and administration items; current and major repairs of fixed assets of administrative and management purpose; communication services of administrative and management units; travel of administrative and management personnel; administrative and management items and materials; community facilities.

The expediency of distributing indirect costs among university departments is justified by the need to consider them when calculating the cost and price of educational services, which allows reliably estimating the number of costs related to a particular type of services and making an objective distribution of costs among the main divisions of the university that provide these services, i.e. determining the results of activity of each department, comparing their income and direct and indirect costs.

Indirect costs are distributed between departments according to the appropriate distribution bases. The total costs of each department are calculated by adding to the direct costs of the distributed indirect costs. Then, the profitability of fixed assets invested in each of the departments is calculated. The next step in assessing and analyzing the effectiveness of departments is to bring the indicators into a standardized form, for which the maximum value among the calculated indicators of profitability and cash flows is determined and taken as a standard. Other indicators are standardized (normalized) relative to the corresponding indicator of the standard.

The experts noted the importance of program-targeted financing and indicative planning of relevant costs in development when assessing the prospects for the process of determining key indicators of the economic activity of a state-owned university as a single economic complex. Their essence is in the distribution of financial resources between budget funds managers, considering the achievement of specific results that meet the priorities of the budget program. The above-mentioned model involves a transition to medium-term budget planning with clear rules for changing the volume and structure of assignments, the fate of which can be decided by budget managers. Therefore, the university budgeting process involves identifying clear spending priorities and evaluating the impact of their implementation due to a significant expansion of the powers of university administrations.

The experts stressed that there is a need for the own system of performance indicators to measure the effectiveness of expenditures on earmarked programs funded from the budget. The role of performance indicators of the use of both budgetary allocations and the university own revenues is assigned to the system of indicators of the efficiency of using financial resources.

Program-targeted budget financing in higher education can be implemented only if the generally accepted system of indicators is adapted to the specifics of educational activity. The costs associated with the introduction of a cost-effectiveness assessment system should be economically feasible.

A lot depends on the identification of various types of educational activity when forming a system of balanced indicators for assessing the university's cost-effectiveness: consolidation of the organization functions of all educational activities for some units, for others (educational) – the implementation of the learning process.

Evaluation of the cost-effectiveness of any of the university structural units is based on the analysis of the educational program's profitability. The most acceptable way of accounting for expenses at the level of the university's functional units, according to the experts, is the methodology of functional-cost analysis, or, as it is also called, process-oriented analysis. It allows dividing the costs by the levels of specific performers and individual processes. When using this technique, all types of expenses are compared with similar indicators at any level of the organization, regardless of functional purpose. The step-by-step implementation of the methodology helps to consider and evaluate all the elements of the costs of implementing the budget program, that is, to analyze the actual execution of the university budget. At the same time, the compliance of actual costs with regulatory ones is checked.

When using this technique, the following sequence of actions is advisable: rationalization of the organizational structure of the university based on the introduction of reliable management accounting; budgeting of the university based on consolidating costs for each educational program; separation of costs into variables and constants; determination of the financial result and calculation of the profitability of educational programs.

It is necessary to consider that educational activities have separate stages, for the implementation of which different expenses are needed, when calculating the profitability of educational programs: short-term variables, long-term variables, and constants.

It is possible to calculate the cost level for each educational program by distributing the working hours of workers, loading premises, and technological equipment. Costs that directly depend on the size of the paid contingent should be attributed to short-term variables, those that are somewhat dependent on the contingent – to long-term variables, and those costs that change when it is necessary to expand the premises or purchase new equipment should be attributed to constant variables. The financial result of educational activities – the assessment of the net income of ongoing training programs (courses) – is equal to the income received from the consumer of services minus the cost of the program (training course). At the same time, the profitability of the educational program can be determined – the ratio of net income to cost.

The cost of an educational program can be calculated as the sum of the costs of its implementation for one student (based on estimates), which makes it possible to evaluate the long-term profitability of each training program (profitability of a specialty).

The introduction of a system of indicators for measuring the effectiveness of university expenditures transforms the traditional approach to the use of funds under the item of expenditure estimates to a progressive one. This ensures that the implemented expenditures correspond to the goals and, above all, the results of educational activities. This means the transformation of the functional and economic classification of expenses from departmental to program one, by which they achieve process transparency – the final result and public responsibility for the efficient use of resources.

Conclusions

Significant changes have occurred in the financing system of state higher education institutions in the process of developing market relations, which are characterized by an increase in cash receipts from the provision of paid services, in particular, training on a contract basis.

The paper proposes a model for evaluating the economic efficiency of university departments, which confirmed the hypothesis of the study that the use of analytical support for evaluating the functioning efficiency of university departments will allow its leadership to implement measures to increase the efficiency of the educational institution as a whole by improving the efficiency and effectiveness of its departments.

The subject of further research may be the development of organizational and information support for assessing and managing the performance of university departments and the inclusion of an economic justification of the coefficient of significance of the constituent performance indicators of departments in the proposed analytical support, which are determined on the basis of expert assessment, considering the specific conditions of the university's functioning and the goals set regarding the adoption of managerial decisions on the effectiveness of the use of resources of the educational institution by its departments.

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