

Innovative Methodology For Assessing The Efficiency Of The University

Ikramov Murat Akramovich¹, Ikramov Maksad Muratovich², Nabiyeva Nilufar Muratovna³, Eshmatov Sanjar Azimkulovich⁴

¹DSc., professor at "Marketing" department of Tashkent state university of economics, Tashkent, Uzbekistan

²Specialist at "Uzbekistan airways" joint stock company, Tashkent, Uzbekistan.

³Ph.D, associate professor Fergana Polytechnic Institute, Fergana, Uzbekistan.

⁴Ph.D, associate professor at "Marketing" department of Tashkent state university of economics, Tashkent, Uzbekistan.

Abstract. The article proposes a methodology for assessing the internal and external effectiveness of the university, reflecting the compliance of the level of functioning of the university with the competitive requirements of the market for vocational education services. This article presents the methodology developed by us for assessing the effectiveness of the university.

Keywords: assessment, vocational education, university performance, university competitiveness, university development strategy, service market.

1.Introduction

Currently, the educational sector is considered by the state as a priority of one of the national points of growth, and investments in improving the quality of human capital are a condition for the development of all sectors of the economy.

As part of the concept, more than 70 targets have been approved, which are planned to be achieved by 2030. Among them, an increase in the enrollment of graduates in higher education from the current 20% to 50%, the number of non-state universities, including on the basis of public-private partnerships (PPP), from 5 to 35, enrollment in the credit-module system - from 2% to 85%.

Starting from the 2020/2021 academic year, the educational process in higher educational institutions (HEI) is gradually being transferred to a credit-module system. In addition, from January 1, 2021, when organizing the educational process, weekly training days are determined by higher educational institutions independently.

From the same date, payment of hourly wages to professors-teachers teaching in technical schools at higher educational institutions is carried out in the amount of hourly wages for teaching students of higher educational institutions.

Under these conditions, the task of increasing the efficiency and competitiveness of the university is being updated. To solve this problem, it is necessary to develop a more advanced methodology for assessing the effectiveness of the university, which should take into account the specifics of a market economy, consider the university as an integral system and ensure a high degree of reliability and objectivity of the evaluation results.

2.Literature review

Evaluation of the effectiveness of higher education by brand approaches from foreign scientists D.Aaker [1], R.Barro [2], E.C.Andrade [3], E.Hanushek [4], Kozma B.R., A.Maddison, G.Philip [5], It is reflected in the research works of L. Pritchett and other foreign scientists.

David Aaker [1] in 1991 and Keller [6] in 1998 contributed to the development of the concept of brand equity. But even though the basis of this concept was formed and modified from year to year, approaches to optimize its management and determine its value are still being considered by world scientists.

Development of the image of HEIs, creation and development of their brand and other issues E.O. Akvazba, E.V. Balatsky, N.N. Bedenko, K.N. Gojenko, A.Kh. Jankaziev, A.P.

Kolyadin from the scientists of the CIS countries, L. Polishchuk, A.K. Scientific articles, monographs and dissertations of Savina, V.I. Sukhochev and others were studied and analyzed, and relevant recommendations were given.

Based on the study and analysis of the methodological aspects in the scientific works of R. Alimov, G.N. Akhunova, B.A. Begalov, S.S. Gulyamov, Ikramov M.[9], Eshmatov, S.[10], Elshodovna, A. N.[11], Mustafakulov, S. I.[12], Abdurakhmanova, G. K.[13], Khodiev, B. Y.,[14] and others, among the economists of our country, it was concluded that the effectiveness of HEIs has not been fully clarified until now.

3. Analysis and results

There are three stages in the reform and development of higher education in independent Uzbekistan. The first, transitional stage covered the time period from the moment of gaining national sovereignty in 1991 to mid-1997. The second starts with the 1997 reform until mid-2017. And the third is the stage of modernization and digitalization, which began from 2017 to the present and is associated with a new historical period in the development of the country. At each stage, the sphere of higher education as a social institution solved certain problems in accordance with the adoption of laws on education three times, for its further improvement it was necessary to modernize the foundations of the system.

Despite certain positive results and an increasing number of higher educational institutions, the number of students in them by the end of the second stage has significantly decreased even compared to 1991. So, if in 1991 337.4 thousand students studied in all types of educational institutions, then by 2016 their number decreased to 268.3 thousand. At the same time, the population of the republic for this period increased by 1.5 times. In addition, correspondence departments were closed in many higher educational institutions, and quotas for admission were reduced in several areas. The demand for higher education has remained high all the time and has a growing trend. Thus, between 1996 and 2016, the number of applicants who applied for admission increased by 528 percent, while the admission quota increased by only 18 percent. If in 1996 the admission quota was 46.2 percent of the number of applications submitted, then in 2016 it was 8.7 percent. Paradoxically, the large unsatisfied demand has led to a decrease in the quality of education,

giving paramount importance only to the presence of a document on higher education.

Low enrollment in higher education makes it impossible to expand the number of qualified personnel, which could hinder the industrial and innovative development of the country. Overall tertiary enrollment in Uzbekistan declined from 17 percent in 1991 to about 9 percent in 2016, which was significantly lower than in neighboring republics (Kazakhstan 41 percent, Kyrgyz Republic 49 percent), Russia and the countries of the Economic Cooperation Organization and Development (OECD) with high incomes (about 75 percent).

Despite an increase in the number of higher education institutions of almost 8 percent between 2008 and 2016, the number of graduates decreased by 20 percent as a result of the application of quotas (only

9 percent of applicants annually entered higher educational institutions of the republic). And although the number of universities and students in them grew, there was an obvious big difference between those who entered and graduated from universities. Shortcomings in educational institutions hampered the process of training qualified personnel who meet modern requirements. The scientific potential also left much to be desired, despite the growth in the number of teaching staff of universities.

At the new, third stage of the development of the renewed Uzbekistan, strategic tasks were put forward, among which a special place was occupied by the cardinal modernization of the higher education system and the elimination of problems that have accumulated in this area and need to be addressed.

A powerful impetus for the cardinal improvement of higher education and a radical revision of the system of training at the level of international standards was the Presidential Decree "On measures for the further development of the higher education system" dated April 20, 2017. At the same time, the Program for the Comprehensive Development of the Higher Education System for 2017-2021 was approved, which identifies nine main areas for the development of the system and measures to strengthen and modernize the material and technical base of higher education institutions, equip them with modern educational and scientific laboratories and modern information - communication technologies. Among them, the most important is the increase in enrollment in higher education. As a result of the measures taken, the number of universities has increased. So, in 2017-2019, six higher educational

institutions and 17 branches, as well as 14 branches of foreign higher educational institutions were created. By the beginning of November 2019, 114 higher educational institutions were functioning in the republic, of which 93 were domestic, 21 were foreign and their branches. In the 2019/2020 academic year, correspondence courses were opened in 59 higher educational institutions, and evening classes were opened in ten higher educational institutions. Based on the proposals of the customers of personnel, 329 areas of education and 582 master's specialties were included in the classifier of areas and specialties of higher education.

Starting from the 2018/2019 academic year, 16 higher educational institutions of the republic have launched training activities on the basis of joint educational programs in cooperation with foreign higher educational institutions, which contributed to the expansion of opportunities for familiarization with international best practices in the education system. For three years, the increase in the scientific potential of higher educational institutions of the republic by 5.1 percent has been achieved.

Particular attention was paid to the training of scientific and pedagogical personnel of higher education, the development of university science. At the National University of Uzbekistan, the Center for the Development of Nanotechnologies, the Research Institute of Physics of Semiconductors and Microelectronics, the Institute of Biophysics and Biochemistry, and the Scientific and Practical Center for Intelligent Software Systems were established.

The number of students admitted to master's programs also more than doubled, from 5,000 to 11,500. In the 2019/2020 academic year, 6 percent of the teaching staff of universities was updated at the expense of master's degree graduates. At the beginning of the 2020/2021 academic year, a total of 32.1 thousand professors and teachers work in higher educational institutions of the country. Of these, 14.2 thousand are women, which is 44.2 percent.

In order to solve the existing problems of higher education, the most important historical document was adopted - the Decree of the President "On approval of the Concept for the development of the higher education system of the Republic of Uzbekistan until 2030" dated October 8, 2019. As part of this concept, more than 70 targets were approved, which are planned to be achieved by 2030. Among them, an increase in the enrollment of graduates in higher education from 20 percent to 50 percent based on the

opening of state and non-state universities in the regions and the creation of healthy competition, an increase in the number of non-state universities, including on the basis of public-private partnerships, and coverage with a credit-modular system.

The system of higher education in Uzbekistan is currently undergoing major changes. The coronavirus pandemic has also set new tasks for it, accelerating the digital transformation of universities.

Higher educational institutions had to overcome many difficulties. For example, the lack of readiness of teachers and students to work in a new format, the inability of some students to connect to the Internet - about 30 thousand people, that is, 8 percent of the total number of students, faced such a problem.

Modernization in the higher education sector of Uzbekistan at the current stage is a necessary and adequate response to the socio-economic and socio-political changes taking place in the country and on the world stage as a whole. Despite the fact that our labor market has undergone significant transformations, higher education in Uzbekistan does not correspond to the modern labor market. First of all, this was due to the slow reaction of the system to significant changes in the economic and political life of the country. The leadership of the state has set a difficult task for the educational program - to correspond to the world level. The society faces a strategic task - the formation in Uzbekistan of the foundation of a new Renaissance - the third Renaissance through large-scale democratic reforms, including in the education system, and this is considered as a national idea.

A new impetus in large-scale transformations was the Law "On Education", adopted on September 23, 2020, and the Decree of the President "On measures to develop the fields of education and upbringing, and science in the new period of development of Uzbekistan" dated November 6, 2020. Forms of distance, inclusive education are being introduced in the sphere, educational institutions of the country can open faculties and training centers together with foreign educational institutions. Teachers are granted the right to introduce copyright programs and teaching methods, free choice of modern pedagogical forms and methods of education and upbringing. On the basis of decrees and resolutions of the President in this area, the number of students in universities has increased three times on average, admission quotas have increased, admission to undergraduate and graduate programs has become more transparent.

As a result, a system has been created for the admission of talented and capable young people for training.

Over the past five years, 64 new higher educational institutions have been organized in the republic, and their total number has grown from 77 to 141. The activities of non-state higher educational institutions are being established on the basis of a public-private partnership system. Forms of evening and correspondence education have been restored, admission quotas are increasing. At the beginning of the 2020/2021 academic year, there were a total of 571.5 thousand students in higher education institutions, of which 260 thousand (45.5 percent) were women. The enrollment rate of school leavers in higher education has increased from 9 percent in 2016 to 28 percent in 2020, and work continues in this direction. In the 2020/2021 academic year, 174.9 thousand students were admitted to universities, and in the 2021/2022 academic year - 182 thousand. Compared to the corresponding period of the previous academic year, enrollment increased by 26.6 percent. In total, 83.9 thousand people graduated from universities in 2020. In 2020, 940 full-time places were allocated for education on the basis of a state grant for girls from low-income families and living in rural areas, and in the 2021/2022 academic year, the number of grants for girls from needy families was doubled and amounted to two thousand places. The state program for 2021 provides for an increase in the number of state grants for higher education by 25 percent and the number of grants for girls from families in need twice.

Now 10 non-state and 27 foreign higher educational institutions and their branches are fruitfully working in our country. Scientists from Moscow State University, MISiS, Webster University are recognized all over the world. The country implements joint educational programs with 104 leading universities of 22 states with the issuance of double diplomas. The organization of branches of foreign universities and the launch of joint programs contribute to the creation of competition within our education system. So, at the beginning of the 2020/2021 academic year, a total of 27.7 thousand students studied in foreign higher educational organizations of the republic. Compared to the 2016/2017 academic year, their number increased from 9.3 thousand to 18.4 thousand people.

The monthly salary of university professors and teachers has increased by an average of 3.5 times over the past three years. A mechanism has been created to improve their

qualifications and train them in foreign universities and research institutes. Starting from 2020, 10 universities have switched to self-financing, and 36 have introduced a credit-module system. Gradually, all universities are being digitalized, the transition to the "Digital University" model is being carried out.

In particular, over the past five years, the number of universities has almost doubled, the admission quota has tripled and amounted to 182,000. The material and technical base of universities has been strengthened. Within the framework of joint educational programs with foreign countries, training of specialists in 64 new specialties has begun.

The experience of Uzbekistan in modernizing the system of higher education shows that universities have formed a unique set of multifunctional areas for training specialists, recruiting faculty, research fundamental and applied work, the availability of specialized laboratories and their production and experimental base, educational branches, strengthening relations with the world community, improving curricula, textbooks and manuals, teaching methods, ensuring full access for all students and teachers to information and communication technologies of the educational process and information resources.

Under the effectiveness of the university, we consider the optimal cost of increasing the human capital of the student and the compliance of the level of human capital of the graduate with the requirements of employers. Accordingly, we introduce the concept of the optimum, which reflects the compliance of the level of functioning of the university with the competitive requirements of the market. In the optimum state, all elements of the university function with the highest possible degree of efficiency.

The level of effectiveness of the functioning of the university is assessed as the proximity of the results of the assessment to the state of the optimum. To do this, we introduce an integral indicator for evaluating the effectiveness of the university (hereinafter - an integral indicator for evaluating the effectiveness) E_{edu} .

To calculate the value of the integral indicator of performance evaluation, we propose the following formula:

$$E_{edu} = \omega \cdot K_{edu} + (1 - \omega) \cdot N_{edu}$$

where K_{edu} is an indicator that characterizes the effectiveness of the university in the external environment (its competitiveness); N_{edu} is an indicator that characterizes the effectiveness of the university's activities in the internal environment; ω is a weighting coefficient

reflecting the degree of dependence of the university on the external environment.

From the standpoint of understanding the effectiveness of the university as an increase in the cost of realized human capital, we have proposed a number of the following generalized resulting parameters of the effectiveness of the functioning of the university.

1. National economic efficiency of the educational activities of the University. The general form of the formula for determining this parameter can be represented as follows:

$$E_{\text{macro}} = \frac{\sum \Delta P^{\text{vp}}}{Z},$$

ΔP^{vp} - an indicator that characterizes the sum of the average annual increase in the amount of value added produced (for all groups of graduates over the past n years), rubles (for graduates of the previous reporting year, the industry-average annual labor productivity of an employee who does not have a professional education is taken as a base); Z is an indicator that characterizes the average (for the last n years) annual costs of training 1 student), rubles; n is the average actual (for all groups of graduates) period of study of a graduate in a given university, years.

2. Personal effectiveness of the educational activities of the university E_{ind} . The general form of the formula for determining this parameter can be represented as follows:

$$E_{\text{ind}} = \frac{\sum \Delta T}{S},$$

ΔT - an indicator that characterizes the sum of the average annual increase in wages (for all groups of graduates over the past n years), rubles (for graduates of the previous reporting year, the industry-average annual salary of an employee who does not have a professional education is taken as a base); S - an indicator characterizing the average (for the last n years) cost of education for 1 student, rubles; n is the average actual (for all groups of graduates) period of study of a graduate in a given university, years.

3. The level of competitiveness of the university in the market of educational services K_{edu} is calculated as a weighted average of the national economic efficiency and personal effectiveness of the educational activities of the university in relation to the maximum values in the industry. The general form of the formula for determining this parameter can be represented as follows:

$$K_{\text{edu}} = (1-m) \cdot \frac{E_{\text{macro}}}{\max\{E_{\text{macro}}\}} + m \cdot \frac{E_{\text{ind}}}{\max\{E_{\text{ind}}\}},$$

here $\max\{E_{\text{macro}}\}$ - an indicator that characterizes the maximum value of national economic efficiency (for all universities that train specialists of a similar specialty, included in the 1; top-10 ranking of universities according to employers); $\max\{E_{\text{ind}}\}$ - an indicator that characterizes the maximum value of personal effectiveness (for all universities that train specialists of a similar specialty, included in the top-10 success rating of university graduates); m is the average share of students with full reimbursement of tuition costs in the total number of university students for n years.

The division of the effectiveness of the university into economic and personal, as well as the weighted average assessment of their contribution to the indicator of the competitiveness of the university, makes it possible to compare commercial, state and mixed-funded universities.

The analysis of the boundaries of values and extreme points (extreme values of parameters) of our proposed assessment indicators is presented in Table 1.

The national economic efficiency of the university can be equal to zero if all university graduates do not work in the economy or there is no increase in their productivity as a result of receiving professional education ($E_{\text{APyp}} = 0$, $E_{\text{macro}} = 0$).

In this case, the activity of the university does not have a beneficial effect on the country's economy, even if the university is successful in terms of profitability and rating.

Table 1 Direction and limitations of calculated and final indicators of performance evaluation

Indicators	Symbol	Value limits	Criteria Orientation
National economic efficiency			
Personal Efficiency			
The level of competitiveness of the university			
Total average annual increase in value added			

Average annual cost of education for 1 graduate	E_{macro}	≥ 0	$E_{\text{macro}} \rightarrow \max$
Average annual increase in wages	E_{ind}	≥ 0	$E_{\text{ind}} \rightarrow \max$
	K_{edu}	$0 \leq K_{\text{edu}} \leq 1$	$K_{\text{edu}} \rightarrow \max$
Average proportion of students with full tuition reimbursement	$\sum \Delta P^{\text{vp}}$	≥ 0	$\sum \Delta P^{\text{vp}} \rightarrow \max$
	Z	> 0	$Z \rightarrow \min$
	$\sum \Delta T$	≥ 0	$\sum \Delta T \rightarrow \max$
	S	> 0	$S \rightarrow \min$
$M \quad 0 < m < 1 \quad \text{weight coefficient}$			

A fairly common case is when a student (especially on-the-job), having received a diploma, continues to work in the same place for a long time without changing his productivity (this is especially true for civil servants). In modern reality, this phenomenon is widespread, but does not apply to absolutely all university graduates. A significant proportion of graduates start their careers with higher productivity than they could provide before entering the university. If, on the other hand, a university graduate works with less productivity than a similar worker without education, then we have a non-economic nature of pricing in the labor market (what took place in the Soviet economy, when the wages of an engineer were lower than those of an unskilled worker). Since the method was developed for a higher education institution operating in a market economy, the method proposed by us does not consider the case of negative total productivity of graduates and negative national economic efficiency ($E_{\text{macro}} < 0$).

The costs of training specialists by their economic nature cannot be equal to zero or less than zero.

National economic efficiency will be maximum if the labor productivity of graduates tends to a maximum, and costs to a minimum.

The personal effectiveness of the university can be equal to zero in the event that the total average annual increase in the amount of remuneration of graduates, calculated taking into account inflation in comparable prices, is equal to zero. Theoretically, this is possible, but in practice the likelihood of such a situation occurring is negligible. There may be a decrease in wage levels during one or two years of the crisis, so a wider time period is taken for evaluation. The methodology does not assess the

increase in labor productivity and wages of graduates throughout their careers, since there is a factor of obsolescence of knowledge and skills acquired at the university. In our methodology, we proceed from the assumption that the period of evaluation of graduates' work activity (n) should be equal to the average period of study at a university.

The average annual cost of a student's education for a university, by its economic nature, should be positive. Of course, there is budget funding for education, scholarship programs and other methods to ensure equal access to education for low-income segments of the population. However, this education is free (or even with scholarships and other subsidies) only for the student, the university receives a budgetary or private reimbursement of its expenses. Personal effectiveness reflects the market side of the relationship between the university and the student. The higher the personal efficiency, the more willingly the consumer chooses the educational services of a given university, the higher the competitiveness of the university in the market of educational services.

For more accurate calculations of the personal efficiency of the university, instead of the average annual cost of education, the indicator of the average annual cost of education can be used, calculated taking into account possible lost profits (the amount of possible earnings of a student in the place of an unskilled worker) and additional costs for education, which are not included in the official cost.

Personal efficiency will be maximum if the increase in the salary of graduates tends to the maximum, and the cost of education - to a minimum.

The level of competitiveness of the university (KeCi) can be equal to zero only if both the national economic efficiency and the personal efficiency of the university are equal to zero. Based on purely economic considerations, such a university should not exist. However, studying the practice of Russian vocational education, one can find many universities that exist with a level of competitiveness close to zero. This is due to the non-economic features of the Russian market of higher professional education, when a student pays money not for gaining knowledge and the opportunity to recoup it in the future with a higher level of remuneration, but for receiving a document on graduation from a university, a deferment from the army, or because of a subjective opinion about prestige higher education as such, regardless of the level of knowledge and further employment.

The level of competitiveness of a university is equal to one, if within the given market it simultaneously has the maximum level of national economic and personal efficiency. However, if we expand the boundaries of the educational market (region, country, world), then in each of these markets a university can have its own values of the level of competitiveness.

From the standpoint of the approach, when the educational process is viewed through the prism of the final result - the realized human capital, we identify the concepts of external efficiency of activity and the competitiveness of the university.

The external efficiency of the university activity reflects the fulfillment of the expectations of two groups of interests: the employer - in the high productivity of university graduates, and the employer - in the level of wages adequate to the funds and efforts spent on education.

The effectiveness of the functioning of the university depends on both the external and internal components, so there is a need to determine the internal efficiency of the university. Internal efficiency is related to the university's need for self-preservation and reproduction, that is, how rationally the processes within the university are organized, how much the university reimburses the costs of training specialists, etc. To determine the internal efficiency of the university, we propose the following formula:

$$N_{edu} = \beta_1 A + \beta_2 BN + \beta_3 Cn + \beta_4 DN + \beta_5 RN + \beta_6 Gn + \beta_7 Ln + \beta_8 Hn + \beta_9 Wn$$

Weight coefficients ($\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9$) reflect the degree of influence of each

subsystem on the internal efficiency of the university. Indicators (AN, BN, CN, DN, RN, GN, LN, HN, WN), characterizing various types of efficiency of the functioning of the university in the context of subsystems, in the proposed methodology are determined according to the following scheme:

I. Subsystems are identified that reflect the most important aspects of the university's activities (in this study, they coincide with the criteria for evaluating the effectiveness given in the first chapter).

II. The selected indicators are distributed among selected subsystems.

III. For each of the selected subsystems of the effectiveness of the functioning of the university, weighting coefficients are determined, showing the degree of influence of the calculated indicator on the resulting indicator of efficiency for the selected subsystem.

We reflected the indicators characterizing the effectiveness of the functioning of the university for each of the subsystems by the following dependencies:

$$A_n = F\{A_i \dots A_k\} \text{ (6)}$$

$$B_n = F\{B_i \dots B_k\} \text{ (7)}$$

$$C_n = F\{C_i \dots C_k\} \text{ (8)}$$

$$D_n = F\{D_i \dots D_k\} \text{ (9)}$$

$$R_n = F\{R_i \dots R_k\} \text{ (i0)}$$

$$G_n = F\{G_i \dots G_k\} \text{ (ii)}$$

$$L_n = F\{L_i \dots L_k\} \text{ (i2)}$$

$$H_n = F\{H_i \dots H_k\} \text{ (i3)}$$

$$W_n = F\{W_i \dots W_k\} \text{ (i4)}$$

IV. The number of indicators for each of the subsystems in the above dependencies is not strictly regulated. It may depend on the specifics of the university, the completeness of the statistical base and other conditions. a) The indicator that characterizes the effectiveness of the functioning of the university management (Lk) is determined by us on the basis of a number of indicators related by appropriate weighting factors that reflect the degree of influence of each indicator on the effectiveness of the university management.

$$AN = a_1 A_1 + \dots + a_j A_j + \dots + a_k A_k$$

where $a_1, \dots, a_k$ - weight coefficients calculated on the basis of expert assessments; $L_1, \dots, L_k$ - indicators characterizing the effectiveness of the functioning of the management of the university.

b) The indicator characterizing the effectiveness of the creation and implementation

of the strategy of the university (Bq) is determined by us on the basis of a number of indicators related by appropriate weight coefficients, reflecting the degree of influence of each indicator on the effectiveness of strategic management in the university.

$$BN = b_1 B_1 + \dots + b_j B_j + \dots + b_k B_k$$

where $b_1, \dots, b_k$ - weight coefficients calculated on the basis of expert assessments; $B_1, \dots, B_k$ - indicators characterizing the effectiveness of the creation and implementation of the strategy of the university.

c) The indicator that characterizes the effectiveness of the use of the human resources potential of the university (SC) is determined by us on the basis of a number of indicators related by appropriate weight coefficients, reflecting the degree of influence of each indicator on the efficiency of using the potential of teachers and employees of the university.

$$CN = c_1 C_1 + \dots + c_j C_j + \dots + c_k C_k$$

where $c_1, \dots, c_k$ - weight coefficients calculated on the basis of expert assessments; $C_1, \dots, C_k$ - indicators characterizing the effectiveness of the use of the human resources potential of the university.

d) The indicator that characterizes the efficiency of the use of university resources (Vk) is determined by us on the basis of a number of indicators related by appropriate weight coefficients, reflecting the degree of influence of each indicator on the efficiency of using various types of university resources.

$$DN = d_1 D_1 + \dots + d_j D_j + \dots + d_k D_k,$$

where $d_1, \dots, d_k$ - weight coefficients calculated on the basis of expert estimates; $D_1, \dots, D_k$ - indicators characterizing the efficiency of the use of university resources.

e) The indicator characterizing the efficiency of the internal processes of the university (Rjy) is determined by us on the basis of a number of indicators related by appropriate weight coefficients, reflecting the degree of influence of each indicator on the efficiency of the processes of the university.

$$RN = r_1 R_1 + \dots + r_j R_j + \dots + r_k R_k,$$

where $r_1, \dots, r_k$ - weight coefficients calculated on the basis of expert estimates; $R_1, \dots, R_k$ - indicators characterizing the effectiveness of the internal processes of the university.

f) The indicator that characterizes the effectiveness of the quality management system

for training specialists at the university (cjh) is determined by us on the basis of a number of indicators related by appropriate weighting factors that reflect the degree of influence of each indicator on the quality of training of a university specialist.

$$GN = g_1 G_1 + \dots + g_j G_j + \dots + g_k G_k$$

where - weight coefficients calculated on the basis of expert assessments; $G_1, \dots, G_k$ - indicators characterizing the effectiveness of the quality management system for training specialists in the university.

g) The indicator characterizing the effectiveness of the university staff motivation system (bk) is determined by us on the basis of a number of indicators related by appropriate weight coefficients that reflect the degree of influence of each indicator on the satisfaction of teachers and employees with their work in this university.

$$LN = l_1 L_1 + \dots + l_j L_j + \dots + l_k L_k$$

where $l_1, \dots, l_k$ - weight coefficients calculated on the basis of expert assessments; $L_1, \dots, L_k$ - indicators characterizing the effectiveness of the system of motivation of the university staff.

h) The indicator that characterizes the effectiveness of the system for creating and maintaining a positive image and reputation of the university (IR) is determined by us on the basis of a number of indicators related by appropriate weight coefficients that reflect the degree of influence of each indicator on the image of the university existing in society.

where $L_1, \dots, L_k$ - weight coefficients calculated on the basis of expert estimates; $L_1, \dots, L_k$ - indicators characterizing the effectiveness of the system for creating and maintaining a positive image and reputation of the university.

i) The indicator that characterizes the economic efficiency of the university is determined by us on the basis of a number of indicators related by appropriate weighting factors that reflect the degree of influence of each indicator on the main financial indicators of the university and the state of its material and technical base.

$$WN = w_1 W_1 + \dots + w_j W_j + \dots + w_k W_k$$

where $w_1, \dots, w_k$ - weight coefficients calculated on the basis of expert estimates; $W_1, \dots, W_k$ - indicators characterizing the economic efficiency of the university.

Table 2 presents the results of our analysis of the boundaries of values and extremum points

of indicators for assessing the internal efficiency of the university.

As we can see, all calculated performance indicators for subsystems and the final indicator of the internal efficiency of the university are within the same boundaries and have the same focus.

Approaches existing in the economic literature involve the use of weighting factors to eliminate errors in the integral assessment caused by the assumption of an equal influence of all normative indicators on the value of the integral indicator.

Table 2 Direction and limitations of indicators for assessing the internal efficiency of the university's activities

Indicators	Symbol	Value limits	Criteria Orientation
The effectiveness of the functioning of the management of the university	A_N	$0 \leq A_N \leq 1$	$A_N \rightarrow \max$
The effectiveness of the creation and implementation of the strategy of the university	B_N	$0 \leq B_N \leq 1$	$B_N \rightarrow \max$
Efficiency of using the human resources potential of the university	C_N	$0 \leq C_N \leq 1$	$C_N \rightarrow \max$
Efficiency of using university resources	D_N	$0 \leq D_N \leq 1$	$D_N \rightarrow \max$
The effectiveness of the internal processes of the university	R_N	$0 \leq R_N \leq 1$	$R_N \rightarrow \max$
The effectiveness of the quality management system for training specialists at the university	G_N	$0 \leq G_N \leq 1$	$G_N \rightarrow \max$
The effectiveness of the system of motivation of the university staff	L_N	$0 \leq L_N \leq 1$	$L_N \rightarrow \max$
The effectiveness of the system for creating and maintaining a positive image and reputation of the university	H_N	$0 \leq H_N \leq 1$	$H_N \rightarrow \max$
	W_N	$0 \leq W_N \leq 1$	$W_N \rightarrow \max$
Economic efficiency of the university	N_{edu}	$0 \leq N_{edu} \leq 1$	$N_{edu} \rightarrow \max$

Coefficients (β_i , a_i , b_i , c_i , d_i , r_i , g_i , l_i , h_i , w) in our model determined by experts.

As standard indicators for evaluating the effectiveness of the functioning of the university (A_i , B_i , C_i , D_i , R_i , G_i , L_i , H_i , W_i) it is necessary to use only relative and reference indicators for which the following restriction is valid: $0 \leq \{A_i, B_i, C_i, D_i, R_i, G_i, L_i, H_i, W_i\} \leq 1$. For any of the relative normative indicators, the value $\{A_i, B_i, C_i, D_i, R_i, G_i, L_i, H_i, W_i\} = 1$ means the maximum possible value of the indicator. If it is impossible to determine the state of the optimum for the normative indicator, we propose to use benchmark indicators, defined as the ratio of the indicator for the studied university to the maximum value of the indicator for the country's universities included in the top-10 university rankings. It is also acceptable to use the average indicator for universities of the top-10

rating, if its value does not exceed the indicator for the university under study.

4. Conclusions

Thus, we have presented a methodology that allows us to quantify the effectiveness of the functioning of the university, both in the current period and in the future. On the basis of this method of interrelation of subsystems of the university, external and internal efficiency, it is possible to determine the strengths and weaknesses in the work of the university, which, in turn, allows us to develop recommendations for the formation of an effective strategy for the development of an educational institution in market conditions for the corresponding university.

The method proposed by us has a number of advantages that determine its scientific and practical value. In particular:

1. The methodology is a more advanced tool for assessing the effectiveness of the university, which fully takes into account the characteristics of a market economy.

2. The technique is universal. That is, it is applicable to any educational institution engaged in vocational education. In addition, this technique can be used to assess the effectiveness of the functioning of both the entire university and narrower sections - individual subsystems.

3. The technique has considerable flexibility and a high degree of reliability of the results. In practice, any number of normative indicators can be used to assess the effectiveness of the functioning of the university, and even in the absence of data on individual subsystems, the integral indicator does not reduce its degree of objectivity.

5. References:

1. Aaker D., Building Strong Brands, the Free Press, US, 1996, p 340.
2. Barro, R., 1999. «Human Capital and Growth in Cross Country Regressions», Swedish Economic Policy Review, Vol.6, pp.237–77;
3. E.C.Andrade, Laurini, M., 2010. «New evidence on the role of cognitive skills in Economic Development», Economics Letters, Vol.117 (1), pp.123–26;
4. Hanushek, E., Kimko, D., 2000. «Schooling, Labor-force quality, and the growth of nations», American Economic Review, Vol.90(5), pp.1184–208;
5. Philip G. Altbach, Liz Reisberg, Laura E. Rumbley (2009). Trends in Global Higher Education: Tracking an Academic Revolution. A report prepared for the UNESCO 2009. World Conference on Higher Education. – p. 10;
6. Kevin Lane Keller (1998), “Measuring Customer-Based Brand Equity,” in Perspectives of Modern Brand Management, ed. Dr Franz-Rudolf Esch, 989-1010.
7. Jagdish N. Sheth, Rajendra S. Sisodia and Arun Sharma, The Antecedents and Consequences of Customer-Centric Marketing, Journal of the Academy of Marketing Science 2000; 28; 55
8. Набиева, Н. М., & Эшматов, С. А. (2019). ЗНАЧЕНИЕ ОБРАЗОВАТЕЛЬНЫХ УСЛУГ В ИННОВАЦИОННОЙ ЭКОНОМИКЕ. In Экономический рост России: проблемы и стратегические перспективы (pp. 81-86).
9. Ikramov, M., Eshmatov, S., Samadov, A., Imomova, G., & Boboerova, M. (2021). Management Marketing Strategy for Formation of Local Brand of Milk and Dairy Products in the Digital Economy. REVISTA GEINTEC-GESTAO INOVACAO E TECNOLOGIAS, 11(2), 443-466.
10. Azimkulovich, E. S. (2022). Methodological Aspects of Food Products National Branding. International Journal of Multicultural and Multireligious Understanding, 9(6), 252-257.
11. Azimkulovich, E. S., Elshodovna, A. N., Qizi, B. M. X., Qizi, O. S. S., Bakhtiyorovich, S. I., & Obotov, K. M. (2021). STRATEGY OF HIGHER EDUCATION SYSTEM DEVELOPMENT: IN CASE OF UZBEKISTAN. Review of International Geographical Education Online, 11(10), 1973-1988.
12. Mustafakulov, S. I., Tursunov, B. O., & Tursunov, U. A. (2019). The empirical research on causal relationship between export and foreign investments in the economy of Uzbekistan based on granger test. International Journal of Engineering and Advanced Technology, 9(1), 4631-4635.
13. Abdurakhmanova, G. K., Fayziyeva, D. S., Gaibnazarov, S. G., Tursunov, B. O., & Shayusupova, N. T. (2020). Methodical aspects of establishing a control system over compliance with principles of decent work and social security in textile enterprises. Journal of Advanced Research in Dynamical and Control Systems, 12(5), 73-81.
14. Khodiev, B. Y., Mustafakulov, S. I., Tursunov, B. O., Sigidov, Y. I., & Khavrova, K. S. (2019). Methods for control efficiency evaluation of the production capacities application at the textile enterprises and the mechanism for optimal control. Astra Salvensis, 7(S1), 499-521.