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MAIN DIRECTIONS OF EFFECTIVE USE OF HUMAN CAPITAL IN PETROCHEMICAL ENTERPRISES

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ABSTRACT
of the dissertation for the degree of Doctor of Philosophy

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GENERAL CHARACTERISTICS OF THE WORK

Relevance and degree of research of the topic. After gaining independence, the Republic of Azerbaijan integrates into the world economy and works to build a competitive economy. In this regard, the economic development trends of the advanced developed countries have been studied and analyzed, and strategic roadmaps have been adopted. The Strategic Roadmap for the National Economic Prospects of the Republic of Azerbaijan identifies the development of human capital as one of the main goals to achieve economic growth and is a key factor in increasing labor productivity, increasing the competitiveness of production and service sectors, the country's integration into global markets.

Azerbaijan 2020: Vision for the Future The seventh section of the development concept, approved by the Decree of the President of the Republic of Azerbaijan dated December 29, 2012, is based on the development of human capital and the establishment of an effective social protection system. The concept focuses on the development of human capital, the provision of quality health and education services in the country and the accessibility of these services to various social groups, including low-income families and poor citizens.

The role of the petrochemical industry in the development of the Azerbaijani economy is very large and has a high share in the import-export balance. National leader Heydar Aliyev has played an unprecedented role in creating more economically efficient new production facilities in chemical enterprises, expanding existing shops and productions and modernizing them on the basis of advanced technologies. It has ensured a leading position in the Azerbaijani economy.

In modern times, human capital is not only the core of all economic processes, but also plays an important role in increasing the efficiency of production activities. Human capital is an important socio-cultural factor of the innovation economy, the main productive force of society and the guarantor of the effective operation of the enterprise. Investment in human capital, as a key element of the successful development of the enterprise, plays a key role in

increasing income and increasing competitiveness. At present, the training, placement and use of their intellectual potential in decision-making is very important all over the world.

The study of human capital, its development directions and features, opportunities for efficient use of human capital is of great importance. At the same time, the topicality of the topic is the speeches of the President of the Republic of Azerbaijan Ilham Aliyev, by his order the laws, strategies and programs on education, vocational education, employment, socio-economic development of the regions, poverty reduction and sustainable development is characterized by the fact that this area is given considerable importance in our country, the research is carried out on the example of the petrochemical complex, which has its own place in the country's economy.

Petrochemical products are exported to several countries around the world, where if the production of competitive products and other conditions are the same, automatically petrochemical products are highly dependent on the efficient use of human capital.

Human resources and their management in Azerbaijan, staff motivation, human capital and all its aspects, problems of petrochemical industry, academician of ANAS Z.A.Samadzade, corresponding members K.J.Imanov, Sh.M.Muradov, A.Kh.Nuriyev, A.F.Musayev and economists T.A. Guliyev, T.N.Aliyev, M.A.Mammadov, R.P.Sultanova, G.A.Azizova, M.C.Atakishiyev, G.A.Safarov, E.M.Hajizade, Sh.T.Aliyev, S.M.Mikayilova, R.A.Balayev, A.H.Tagiyev, N.H.Abbasova, R.H.Guliyev, Sh.S.Mammadova and others occupy one of the main places in scientific works.

Capital and human capital, investment in human capital, human capital and economic growth, etc. Such problems are solved by K. Marx, H. Becker, T. Schultz, V.N. Belkin, S.A. Dyalatov, M.M. Kritskiy, G.N. Tuguskina and others reflected in the scientific works of scientists.

Despite all this, some economists still do not take the same approach to the concept of human capital, which leads to a number of gaps in the definition of effective use of human capital in the

enterprise, the measurement, evaluation and management of human capital. The dissertation is relevant in terms of eliminating these gaps. All this determines the formation of the dissertation.

Object and subject of research. The object of research is the Plant Ethylene-Polyethylene of SOCAR's Azerkimya Production Association. The subject of research is human capital, the factors that shape it and the assessment of human capital.

Aims and objectives of the research. To achieve this goal, the following tasks have been set and solved:

- ✓ research of theoretical and methodological aspects of human capital;
- ✓ identification of areas for human capital research at the enterprise level;
- ✓ measurement and evaluation of human capital in the enterprise;
- ✓ analysis and management of factors determining the effective use of human capital;
- ✓ identification of investments in human capital and directions of their effective use;
- ✓ development of proposals defining the directions of efficient use of human capital in petrochemical enterprises on the example of Ethylene-Polyethylene (EP) plant.

Research methods.

1. The theoretical and methodological basis of the research is the existing theories of human capital, scientific works and research of foreign and Azerbaijani scientists on this issue, the laws of the Republic of Azerbaijan, decrees and orders of the President of the Republic of Azerbaijan.

2. The information base of the research is provided by SOCAR, “Azerkimya” PU and EP plant technical and economic indicators, personnel department data, etc. contane

3. Comparison, grouping, graphic, logical approach, mathematical-statistical methods and mathematical calculations were used in the research process.

Main provisions for defense. In accordance with the main results characterizing the scientific novelty of the work, the following provisions of the dissertation are defended:

- ✓ generalization of scientific approaches to the theory of human capital, taking into account their features;
- ✓ study of methodological bases of its management in order to effectively use human capital in the enterprise;
- ✓ defining the strategy of human capital in the enterprise;
- ✓ assessment of factors and conditions determining the effectiveness of human capital management at the enterprise level;
- ✓ rational use of human capital, application of economic-mathematical methods in the analysis taking into account the probabilistic nature of the factors affecting its level.
- ✓ assessment of indicators of effective use of staff in order to increase human capital;
- ✓ the importance of using the index method in order to effectively use human capital in the enterprise in the following stages: education level, health level, assessment of the level of creative activity

Scientific novelty of the research:

- ✓ For the first time in Azerbaijan, a theoretical analysis of the measurement and evaluation of human capital at the enterprise level was conducted, and directions for its management were given.
- ✓ A single-line linear mathematical-statistical model was developed between the factors influencing labor productivity and its factors (salaries, insurance payments, training and professional development costs, staff turnover, number of graduates, number of people lost due to illness), taking into account the value of the linear correlation coefficient. A multinational mathematical-statistical model of labor productivity has been proposed.
- ✓ The relationship between staff costs and balance sheet profit in the enterprise was considered, and its single-line mathematical-statistical model was proposed.
- ✓ Efficient use of staff to increase human capital was assessed and its block diagram was proposed.

✓ SWOT analysis of the efficiency of investment in human capital in the enterprise was provided, the human capital index was calculated on the basis of education, health, creative activity indices, and its measurement criteria were determined.

Theoretical and practical significance of the research:

✓ Theoretical provisions, results and proposals of the dissertation allow to measure, evaluate and effectively and purposefully use human capital in petrochemical enterprises;

✓ It is expedient to use the obtained results in the activity of other field enterprises.

Approbation and utilization of research outcomes. The main provisions of the dissertation, theoretical and practical proposals were published in a number of prestigious journals and journals, including 14 articles (two abroad), 40 theses (13 abroad), as well as in various conference proceedings held in our country and abroad.

Among the theoretical and methodological results of the dissertation on the effective management of human capital, taught at the Faculty of Economics and Management of Sumgayit State University, "Human Resource Management", "Labor Economics and Human Development", "Motivation in Management", "Enterprise Economics", "Management" It can be used in teaching, as well as in the preparation of graduation theses and master's dissertations. (there is an application act)

Development and recommendations of the dissertation**:** methods of assessing the use of human capital in petrochemical enterprises; directions of determining the factors and conditions characterizing human capital in the enterprise; ways to improve human capital management in the enterprise can be considered in the production and experimental activities Ethylene-polyethylene plant of production association Azerkimya SOCAR

The name of the organization in which the dissertation was carried out. The dissertation was carried out at Sumgayit State University.

The total volume of the dissertation with a sign, indicating the volume of the structural units of the dissertation separately.

Cover and contents (2328 characters), introduction (10685 characters), chapter I (88336 characters), chapter II (88859 characters), chapter III (28918 characters), results and suggestions (9837 characters) and bibliography (23253 characters) The total volume on is 252636.

CONTENTS OF THE DISSERTATION

MAIN PROVISIONS PRESENTED FOR DEFENSE

Thesis 1. Generalization of scientific approaches to the theory of human capital, taking into account their features.

The sum of human abilities is not always capital. The inclusion of human abilities, habits and knowledge in the system of socio-economic relations allows them to be defined as capital. Since the realization of an individual's knowledge and skills through productive labor is a basic condition of the production process carried out for the purpose of making a profit, these means are included in the capital. Human capital is intellect, knowledge, quality and productive labor, quality of life. Human capital can be seen as the sum of investments in the talents and abilities of an individual in an area of activity that can provide income for the future. Human capital can also be considered as an individual's ability to make the most efficient use of all available resources.

Approaches to human capital, both in general and at the enterprise level, allow the study of its socio-economic nature, the general definition of this concept and its distinctive features with the following provisions:

First, human capital is a wealth that is expressed in the knowledge, skills, and habits that a person acquires in the process of education and employment and is used in the interests of society.

second, human capital is characterized by the following features in accordance with its functional purpose: ability of human capital to create value for society, state and enterprise (entrepreneur); ability to bring income to the owner of human capital (man himself); ability to accumulate human capital; human capital has the ability to physically depreciate, depreciate and recover through depreciation; coexistence of human capital with the person who is its carrier; continuation of the use of human capital after the death of a person through business tools, licenses, patents;

third, recognition of human educational and professional skills, health, intelligence, motivation for work and education, determination to mobilize, innate abilities, general culture as structural elements of human capital.

Fourth, human capital finds its evolution in the context of "labor", "labor force", "labor resources", "labor potential", "human resources". Human resources can only be capital if they generate income and create wealth.

Thesis 2. Study of methodological bases of its management for the purpose of effective use of human capital in the enterprise.

When studying the issues of analysis, research and evaluation of human capital in the enterprise, first of all, it is necessary to deeply analyze the directions of how to manage it. The analysis of human capital and methodological aspects of its management in the enterprise is related to the following provisions:

- Taking into account the direct dependence of the efficiency of production and commercial activities of enterprises on the proper management of human capital, the research shows the need to create the necessary staff to ensure the operation of the enterprise and increase the efficiency of their use;
- Strategy in the field of human capital management is conditioned by such elements as employee's skills and competencies, level of qualification, level of performance of duties, management structure, information and knowledge, decision-making, remuneration and incentives;
- From the point of view of effective organization of human capital management, it is necessary to select and place staff, develop a strategy for working with personnel, ensure the effectiveness of labor organization and management mechanism, unequivocally solve problems related to the use of various tools in relation to employee behavior;
- SWOT analysis of human capital investment should be considered necessary in determining the direction of its management;
- The personnel strategy based on the effective management of the staff and aimed at creating a competitive advantage of the enterprise ensures the advantage of the enterprise in the market, mainly through the improvement of working conditions, accurate assessment of performance, integrated management of human resources;

-Human capital is divided into general and special capital. Total capital is taught through mathematics, physics, computer science, law, foreign languages and so on. is created as a result of studying sciences. Private capital is formed in the process of people's labor activity;

- The effective use of human capital is associated with the existence of social capital. Social capital consists of interpersonal relationships, trust, solidarity, the ability to work together and provide assistance;

- The directions of strengthening the role of the human capital management system are to improve the human resources of employees in enterprises, to increase the professional competence of employees.

Human capital management shows how and where investments in human resources result in the highest returns, and how to gain an advantage in human capital.

Business leaders who offer new jobs should take that into account. Involvement of staff is the beginning of work with staff, the main task is to ensure the systematization (communication of goals, objectives, tools and methods) and complexity (coordination with other areas and services), to build effective staff work.

Taking into account all these views, it can be concluded that human capital should be given priority in any field, its effective management should be identified, and its development should become one of the main tasks of the company's personnel strategy. As in all areas, human capital plays an important role in petrochemical enterprises. Because, petrochemical enterprises with technology and science capacity must always use innovative ideas in order to determine the directions of development and increase competitiveness. It is impossible to apply innovative ideas without perfect human capital. In this regard, the current state of petrochemical enterprises should be studied, the use and evaluation of human capital should be analyzed.

Thesis 3. Defining the strategy of human capital in the enterprise.

The human capital strategy in an enterprise should be complemented by information on human capital measurement and analysis. In the process of measuring human capital, it is necessary to determine the following:

1. Harmonization of evaluation sources: including determination of job suitability and ability, which is the basis of the business, indicating the quality of work;

2. Analysis of the relationship between the final indicators and efficiency of the organization and the methods of practical management of people;

3. How the measurement of human capital affects the quality of the organization's work is determined by the practical methods of human management. Therefore, it is very important to know what steps to take to improve the situation. Here it is necessary to take into account the value, not the activity. It is more expedient to evaluate the invested capital with the received income;

4. It is necessary to try to be simple in measuring human capital - it is important to pay attention to the end result and the main, necessary moments of behavior;

5. It is necessary to measure the points of this or that activity in such a way that as a result of these measurements it is possible to obtain the information necessary for decision-making;

6. Analyze and evaluate traditions. To compare the current state of affairs with the purpose;

7. Collection of easily accessible and reliable information;

8. It should be borne in mind that measurement is a means to an end, but not an end in itself.

Thesis 4. Assessment of factors and conditions determining the effectiveness of human capital management at the enterprise level.

The directions of human capital management in the enterprise can be complexed as follows: formation of human capital; development of human capital; preservation of human capital.

The formation of human capital can be carried out in two directions: the involvement of professional staff, the improvement of existing staff.

The development of human capital covers the issues of training and professional development and certification.

The preservation of human capital means stimulating and motivating factors.

These areas should be implemented within the personnel strategy of the enterprise. In accordance with the personnel strategy, the following indicators were used in the study of human capital in enterprises, and each of them was analyzed separately: specialty composition of employees; average level of education; age age; anverage experience in the relevant specialty; costs incurred.

Human capital management leads to the conclusion of the analysis of factors and conditions with the following provisions: The enterprise must effectively use its opportunities to transform material capital into human capital, and for this purpose it must thoroughly study human capital and investigate the directions of its effective use; One of the factors determining the efficient use of human capital is the production of products per employee per year, which depends on the dynamics of staff costs. The level of labor productivity is affected by a number of factors: physical capital, human capital, natural resources, technological knowledge; Efficient use of human capital is directly reflected in the growth of labor productivity; In terms of human capital, labor productivity includes staff training, staff turnover, insurance payments, number of people / days lost due to illness, number of employees with higher education, average monthly salary per employee per year, etc. affects.

Thesis 5. Rational use of human capital, application of economic-mathematical methods in the analysis taking into account the probabilistic nature of the factors affecting its level.

The enterprise must use its potential effectively, transform material capital into human capital, and for this purpose it must thoroughly study human capital and study the ways of its effective use. One of the factors determining the efficient use of human capital is labor productivity. Factors such as physical capital, human capital, natural resources, technological knowledge affect the level of labor productivity. The efficient use of human capital is reflected in the growth of labor productivity. In terms of human capital, labor

productivity includes staff training, staff turnover, average number of employees, number of people / days lost due to illness, number of employees with higher education, average monthly salary per employee per year, etc. We have proposed a number of double-line mathematical-statistical models to determine the degree of density of labor productivity with these factors (table 1) and regression analyzes.

Table 1.

Dynamics of the relationship density between the factor sign and the result sign

Name of factors	Unit of measure ment	$r(-1 \div 1)$	E	Linear regression model	$R^2 \leq 1$
Salary	man.	0,8005	2,0303	$\bar{y}_x = -109{,}44 + 0{,}3625x$	0,6408
Insurance payments	thousand. Man	0,89458	8,41	$\bar{y}_x = 377{,}18 - 0{,}1479x$	0,8003
Training and professional development costs	thousand. Man	-0,41678	0,23	$\bar{y}_x = 130{,}58 - 1{,}406x$	0,1737
Staff turnover	%	-0,70344	-0,3068	$\bar{y}_x = 138{,}68 - 1{,}406x$	0,4948
Number of higher education	People	0,830411	1,51028	$\bar{y}_x = -54{,}175 + 0{,}3243x$	0,6896
Number of people / days lost due to illness	name./day	0,63434	0,97096	$\bar{y}_x = 209{,}22 + 0{,}01x$	0,4024

Source: The table was compiled by the author based on the calculations

We calculated a double-line correlation coefficient for each of these factors and, as a result of comparison, identified the factors most closely related to labor productivity (number of graduates,

wages, insurance payments) and proposed a multinational mathematical-statistical model.

After determining the parameters of the linear multivariate regression model, it is necessary to establish a correlation matrix of the impact of factors on the number of graduates, wages, insurance payments on labor productivity (Table 2).

Table 2

Parameters of the linear multivariate regression model

nəticə (Y)	X1	X2	X3
62,85	400	112,3	465
57,47	532	720,99	426
76,63	581	722,02	436
102,81	624	797,33	420
92,46	605	806,43	416
128,24	664	1215,18	456
158,24	697	1318,5	682
170,98	656	1451,6	656

Source: Compiled by the author based on the calculations.

Using the features of the Excel editor's (**ЛИНЕЙН**) function, we create a table (Table 3). Based on the data in this table, the regression model will be as follows:

Table 3

Correlation matrix of the impact of factors of higher education, wages, insurance payments on labor productivity

correlation matrix				
	Y	X1	X2	X3
Y	1			
X1	0,800487523	1		
X2	0,894580049	0,927584282	1	
X3	0,830411204	0,476347025	0,661560208	1

Source: Executed by the author in MS Excel.

$$\overline{y_3} = -90{,}3 + 0{,}124x_1 + 0{,}032x_2 + 0{,}192x_3$$

Table 4

Parameters of the model of factors influencing labor productivity

a_3	a_2	a_1	a_0
0,191695	**0,03154158**	**0,123595563**	**-90,2981605**
0,0899	0,053971766	0,20927254	106,0486896
0,909405	16,97250987	#н/д	#н/д
13,3842	4	#н/д	#н/д
11566,61	1152,264365	#н/д	#н/д

Source: Executed by the author in MS Excel.

When calculating the regression based on the obtained model, we obtain the following result (Table 5):

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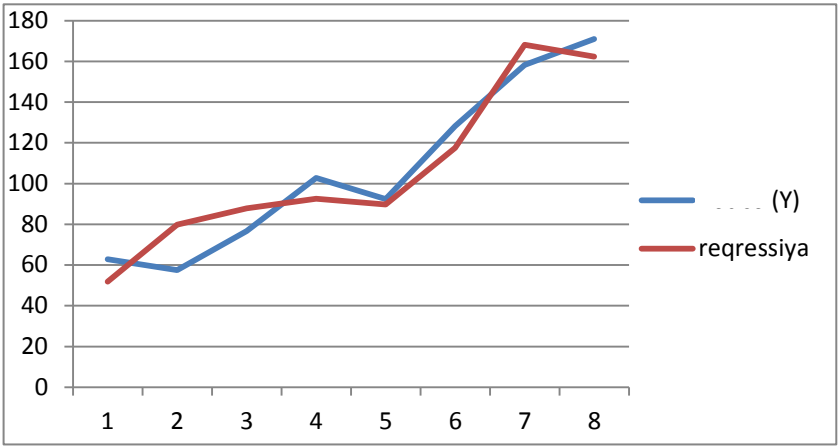
Results of regression calculated according to the model

result (Y)	X1	X2	X3	Reqretion ($\overline{y_3} = -90{,}3 + 0{,}124x_1 + 0{,}032x_2 + 0{,}192x_3$)
62,85	400	112,3	465	51,81947
57,47	532	720,99	426	79,85703
76,63	581	722,02	436	87,86265
102,81	624	797,33	420	92,48554
92,46	605	806,43	416	89,65747
128,24	664	1215,18	456	117,51
158,24	697	1318,5	682	168,1706
170,98	656	1451,6	656	162,3173

Source: Compiled by the author on the basis of technical and economic indicators of the Ethylene-Polyethylene plant and the obtained model.

To check the adequacy of the regression with the result sign, build a graph in the Excel editor (graph 2)



Graph 1. Conformity of the resulting regression
Source: Executed by the author in MS Excel.

The adequacy of the result and regression graphs proves once again that the model built for forecasting can be considered expedient. The analysis of the constructed regression equation was performed with the help of Excel.

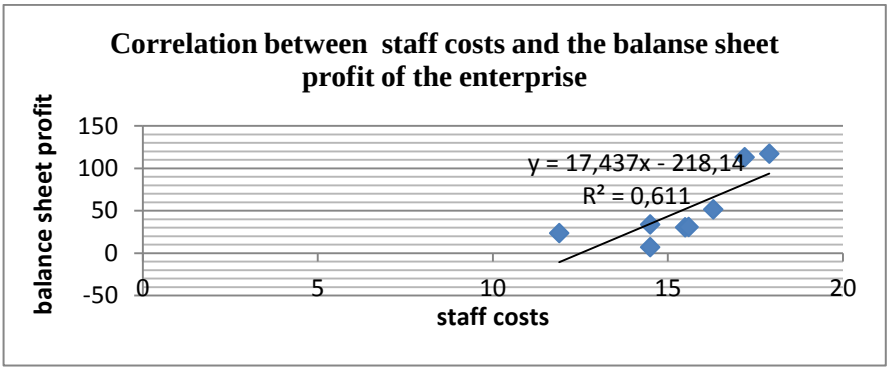
We have considered the relationship between staff costs and balance sheet profit in the enterprise, and proposed a linear mathematical-statistical model. Since all the factors that affect labor productivity have a special weight in staff costs, they also affect the balance sheet profit of the enterprise. In our opinion, it may be more appropriate to examine the relationship between staff costs and profits, which are the end result of economic activity. To determine the dependency, construct a regression model by taking staff costs at the plant EP for 2011-2018 as a factor indicator (x) and balance sheet profit as a result indicator (y) (graph 2). To do this, first determine the parameters (Table 6).

Table 6

Parameters for determining the relationship between profit and staff costs at the plant Ethylene-Polyethylene

Years	X (mln. man.)	Y (mln. man.)
2011	11,9	23,6
2012	15,5	30,3
2013	14,5	6,8
2014	15,6	30,5
2015	14,5	33,8
2016	16,3	51,6
2017	17,2	112,9
2018	17,9	117,1

Source: Compiled by the author on the basis of technical and economic indicators of plant Ethylene-Polyethylene.



Graph 2. Correlation between staff costs and the balance sheet profit of the enterprise

Source: Executed by the author in MS Excel.

$$\bar{y}_x = -218{,}14 + 17{,}437x$$

As a result of the calculation of the double linear-correlation coefficient (r = 0.78), the range of costs and benefits in the range of 0.7-0.9 on the Cheddock scale means that the quality of the strength of the connection density is high. We have found that it is possible to increase profits by 5.29% as a result of a 1% increase in expenses. At the same time, a one-unit increase in staff costs leads to a 17-point increase in balance sheet profit.

In the field of research, we concluded from the analysis of six factors related to the activity of the enterprise that the level of labor

productivity for 8 years (2011-2018) is most affected by the number of graduates, insurance payments and salaries.

Based on the data collected from the plant Ethylene-Polyethylene, a petrochemical plant, our research has shown that the company has certain resources for the efficient use of IR, and the efficient use of these resources is associated with the solution of certain problems. It may be possible to overcome these problems to some extent by increasing staff costs.

Thesis 6. Evaluation of indicators of effective use of staff for the purpose of increasing human capital.

To maintain their competitiveness and profitability, enterprises must constantly explore opportunities to attract human capital and develop a comprehensive action plan for human capital formation. Special attention should be paid to incentives for the efficient use of human resources, as in the absence of these factors, workers are forced to leave their jobs, resulting in increased staff turnover, especially the influx of highly qualified personnel can produce. In order to increase the profitability of staff use, a healthy socio-psychological environment must be created in the enterprise and staff potential must be adapted to the requirements of modern times (table 7).

Table 7

Indicators of effective use of staff at the plant Ethylene-Polyethylene for 2011-2018

Indicators	2011	2012	2013	2014	2015	2016	2017	2018
Staff profitability ratio	10,6	14,3	3,8	17,3	19,8	30,3	53,3	55,6
Personnel flow coefficient (%)	28	22	6,2	17,2	3,3	3,2	3,4	3
Income per employee (thousand man.)	62,85	57,47	76,63	102,81	92,46	128,24	158,24	170,98
Profit from sales per employee (thousand man.)	15,11	7,35	9,48	26,25	7,87	6,31	72,1	74,7

Source: Compiled by the author on the basis of calculations using the technical and economic indicators of the plant Ethylene-Polyethylene.

Based on the data in table 2, it is necessary to calculate the o verall efficiency of the staff as a result of the investment.

It is known that the annual growth rate is calculated by the following formula:

$$f_x = (a_1 - a_0)/a_0$$

Here: fx is the growth rate, a0 is the base year, and a1 is the reporting year.

Now, the dynamics of the growth rate for 2011-2018 has been determined (Table 8):

Table 8

The growth rate of indicators of effective use of staff for 2011-2018 (%)

Indicators	2012	2013	2014	2015	2016	2017	2018
Staff profitability ratio	0,3490	-0,734	3,5526	0,1445	0,5303	0,7590	0,0431
Personnel flow coefficient	-0,214	-0,718	1,7741	-0,808	-0,03	0,06	-0,117
Income per employee	-0,08	0,3333	0,3416	-0,100	0,3869	0,2339	0,0805
Profit from sales per employee	-0,513	0,2897	1,7689	-0,700	-0,198	0,426	0,0360

Source: Compiled by the author on the basis of calculations.

To calculate the increase over the period, the formula,

$$f_x = (a_8 - a_0)/a_0$$

is used. According to the formula, for 8 years, the profitability of staff increased by 4.25, income per employee by 1.72, profit from sales per employee increased by 3.9 times, and staff turnover decreased by 8.3 times. The positive pace of change in each of these indicators is the result of SOCAR's personnel strategy.

Thesis 7. For the purpose of effective use of human capital in the enterprise on the following stages: level of education, level of health, assessment of level of creative activity and importance of use of the index method.

Measurement of human capital in the enterprise The calculation of the human capital index should be considered one of the necessary conditions:

$$IKI = \sqrt[3]{I_1 \cdot I_2 \cdot I_3}$$

Here: I_1-education and specialization index, I_2-health level index, I_3-creative activity index. We calculated each index separately. First, we calculated the education and specialization index using the following formula:

$$I_1 = \sqrt[3]{I_{TII1} \cdot I_{TII2} \cdot I_{TII3}}$$

Here: I_{TII1} - the share of training costs in the total staff costs, I_{TII2} - the index of future professional level, I_{TII3}- the index of the level of qualified staffing of the enterprise.

To find the share of training costs (I_{TII1}) in the total staff costs, the ratio of training and professional development costs to the total staff costs is calculated (table 9).

Table 9

Calculation of the share of training costs in the total staff costs

Indicators	2011	2012	2013	2014	2015	2016	2017	2018
Training costs	3,59	34,64	20,93	9,49	37,51	11.9	13,52	7,31
Staff costs	11863,7	15445,9	14479,7	15632	14509,4	16346,4	17231,2	17900,3
$İ_{TII1}$	0,0003	0,002	0,001	0,0006	0,003	0,0007	0,0007	0,0004

Source: Compiled by the author on the basis of calculations.

To calculate the future professional level index (***I_{TII2}***), we used the following formula:[1]

$$I_{TII2}=(0,15\ OT_s + 0,60\ PT_s + 0,75OIT_s + 1,00AT_s)/I_{o.s.s.}$$

0.15 - for secondary education; 0.60 - for vocational education;

[1] *Лукичева, Л. И. Организационные аспекты управления развитием интеллектуального потенциала персонала наукоемких предприятий // Л. И. Лукичева, Организатор производства,-Воронеж- 2013. № 29,стр.72-75*

0.75 - for secondary special education; 1.00 is the coefficient set for higher education.

We have calculated the level of qualified personnel index (I_{TII3}) as follows:

$$I_{TII3} = (OITs+ATs)/\dot{I}oss$$

We used the following auxiliary table (table 5) to calculate the future professional level (I_{TII2}) and the enterprise's level of qualified staffing indices (I_{TII3}).

Table 10

Dynamics of education level of employees in the enterprise

№	Education	2011	2012	2013	2014	2015	2016	2017	2018
1	Secondary education	1112	1046	984	768	615	946	473	496
2	Vocationally educated	173	125	143	162	190	215	414	409
3	He has secondary special education	484	535	558	475	496	628	137	136
4	with higher education	465	426	436	420	416	456	682	656
5	Total number of employees	2234	2132	1835	1781	1717	1682	1706	1697
6	Average number of employees	2230	2111	1800	1764	1702	1671	1696	1685

Source: Compiled by the author on the basis of technical and economic indicators of plant Ethylene-Polyethylene.

Combining the separate calculations, we have shown the full index of education and specialization in the table below (table11).

Table11

Calculation of education and specialization index in the enterprise

Indicators	2011	2012	2013	2014	2015	2016	2017	2018
I_{TII1}	0,0003	0,002	0,001	0,0006	0,003	0,0007	0,0007	0,0004
I_{TII2}	0,493	0,501	0,604	0.56	0,584	0,717	0,65	0.64
I_{TII3}	0,426	0,455	0,552	0,507	0,536	0,649	0,48	0,47
Index education and specialization	0,0398	0,0770	0,0693	0,0554	0,0979	0,0688	0,0602	0,0494

Source: Compiled by the author on the basis of calculations using the technical and economic indicators of the plant Ethylene-Polyethylene.

Then we calculated index the health level:

$$I_2 = \sqrt{I_{S1} \cdot I_{S2}}$$

Here, Is_1 is calculated as the share of health expenditures in total staff expenditures, ie the ratio of health expenditures to total staff expenditures. We have shown this calculation in the table below (table 12).

Table 12

The share of health expenditures in the total staff costs

Indicators	2011	2012	2013	2014	2015	2016	2017	2018
Health expenses (thousand man)	112,3	720,99	722,02	797,33	806,43	1215,18	1318,5	1451,6
Staff costs	11863,7	15445,9	14479,7	15632	14509,4	16346,4	17231,2	17900,3
I_{s1}	0,009	0,047	0,049	0,051	0,055	0,074	0,077	0,081

Source: Compiled by the author on the basis of calculations.

Index the Temporary Disability (Is_2) is calculated by the following formula:

$$I_{s2}=(x_{orta}-x_{min})/(x_{max}-x_{min})$$

Here, the chord indicates the time of average incapacity, $_{xmin}$ - the time of minimum incapacity, x_{max} - the time of maximum incapacity.

To calculate the index of temporary incapacity for work, we considered it expedient to compile the following auxiliary table (table 13).

Table 13

Index calculation of temporary disability

Indicators	2011	2012	2013	2014	2015	2016	2017	2018
Minimum time of incapacity Xmin, (days)	3	3	3	2	2	2	2	1
Maximum working time without Xmax (days)	274	278	281	313	282	302	217	251
$İ_{s2}$	0,5111	0,5109	0,5108	0,5064	0,5071	0,5067	0,4212	0,5001

Source: Compiled by the author on the basis of calculations.

Based on these indicators, we calculated index the health (table14):

Table 14

Calculation of health index in the enterprise

İndex	2011	2012	2013	2014	2015	2016	2017	2018
$İ_{s1}$	0,009	0,047	0,049	0,051	0,055	0,074	0,077	0,081
$İ_{s2}$	0,5111	0,5109	0,5108	0,5064	0,5071	0,5067	0,4212	0,5001
Index health	0,0678	0,1549	0,1582	0,1607	0,1670	0,1936	0,1800	0,2013

Source: Compiled by the author on the basis of calculations.

To calculate the staff creative activity index (I_3), we must use the following formula:

$$I_3 = \sqrt{I_{ya1} \cdot I_{ya2}}$$

I_{ya1} is calculated as the ratio of the number of employees making effective offers to the average number of employees ($I_{o.s.s.}$), I_{ya2} is calculated as the ratio of the number of employees to the average number of employees ($I_{o.s.s.}$) (table 15).

Table 15

Calculation of creative activity index at plant Ethylene-Polyethylene

Indicators	2011	2012	2013	2014	2015	2016	2017	2018
Number of effective bidders	0	0	0	0	0	0	0	0
Number of Scientific research design department employees	0	0	0	0	29	29	27	27
Average list number of employees	2230	2111	1800	1764	1702	1671	1696	1685
$I_{ya\,1}$	0	0	0	0	0	0	0	0
I_{ya2}	0	0	0	0	0,0170	0,0173	0,0159	0,016
Index creativity activity	0	0	0	0	0	0	0	0

Source: Compiled by the author on the basis of calculations.

It is also clear from the table that the index of creative activity in the enterprise is equal to 0 (table 10). This means that when calculating the human capital index for an enterprise, if the index of creative activity is used, the human capital index will be equal to 0. In this case, in terms of valuation criteria, we consider all the costs of human capital in the enterprise unreasonable. Given all this, we had to calculate the human capital index on the basis of only two indices (index specialization and education and index health):

$$IIK = \sqrt{I_{TII} \cdot I_{SI}}$$

Let's compile the following auxiliary table for calculation of the index human capital (table 16)

Table 16

Calculation of index human capital for plant Ethylene-Polyethylene

Indicators	2011	2012	2013	2014	2015	2016	2017	2018
Index specialization and education	0,0398	0,0770	0,0693	0,0554	0,0979	0,0688	0,0602	0,0494
Index health	0,0678	0,1549	0,1582	0,1607	0,1670	0,1936	0,1800	0,2013
Index human capital	0,0519	0,1092	0,1047	0,0943	0,1279	0,1154	0,1041	0,0997

Source: Compiled by the author on the basis of calculations.

To analyze the significance of the human capital index, we used the human capital measurement table (table 17).

Table 17

Measurement of human capital

Significance of the index	Level characteristic
<0,2	Very low
0,2-0,4	Down
0,4-0,6	Satisfactory
0,6-0,8	Coffee
>0,8	High

Source: Compiled by the author.

According to Table 12, the IHK <0.2 index at the Ethylene-Polyethylene plant is considered very low due to its significance level. The period with the highest human capital index (0.1279) is 2015.

As a result of the calculation of IHK at the plant Ethylene-Polyethylene for 2011-2018 (table 11), it is clear that the education and specialization index at the enterprise is significantly lower than

the education and health index. The health index has recently risen due to the insurance of all employees. The lack of development of the creative activity index is due to a number of reasons. It turns out that this index can not be calculated. This is due to the fact that during those years, the Institute of Chemical Design, which is part of the Azerkimya PU, was mainly engaged in this work. After the closure of the institute in 2015, Scientific research design department was established at the plant Ethylene-Polyethylene and employs 27 people in this department, but not a single person has made an effective proposal for the enterprise over the years. In our opinion, such a situation is not a good thing for the company in a market economy and increasing innovation activity of personnel around the world. Both the company and its employees should be interested in increasing the creative activity, because the main goal of the leading enterprises in modern times is to increase the innovation activity of employees. This means that the company must invest in education and specialization and creative activity, and develop these areas. For this purpose, an Innovation Center should be established at the enterprise and scientists and specialists from various higher education institutions should be involved here, and the integration of science and practice should be carried out. The innovation center can open new opportunities for the company in the selection, recruitment and development of personnel.

The main content of the research is reflected in the following works published by the author:

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