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ABSTRACT

of thesis for the award of the degree of Doctor of Philosophy

IMPROVEMENT USAGE OF THE SCIENTIFIC-TECHNICAL POTENTIAL IN CHEMICAL INDUSTRY

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Introduction

Relevance and development of the topic. The transition of the Republic of Azerbaijan from a system of administrative management to a market economy, the preservation, formation and effective use of the country's scientific and technical human resources potential has become an objective necessity. Classification, planning, formation, evaluation and management of its structural elements are important issues for the country to achieve socio-economic development and take a worthy place among the countries of the world, to effectively use the potential of scientific and technical personnel meeting modern requirements. In this regard, special attention is paid to the formation and development of scientific and technical human resources in Azerbaijan, which has become an important socio-cultural factor of the modern economy. High level of human resources is a key factor in the development of developed countries. From this point of view, the socio-economic reforms implemented in our republic are one of the main priorities of the state programs implemented in Azerbaijan.

Four strategic goals were selected for the perspective development of the national economy in the "Main directions of the strategic roadmap for the national economy and key sectors of the economy" approved by the Decree of Aliyev. One of these goals is related to human resources, and it is planned to adapt human resources to the prospects of the national economy. At the same time, the President of the Republic of Azerbaijan "National Strategy for the Development of Science in the Republic of Azerbaijan for 2009-2015", "Azerbaijan 2020: Vision for the Future" Development Concept, "State Program on Socio-Economic Development of the Regions of the Republic of Azerbaijan for 2019-2023", Decree of the President of the Republic of Azerbaijan "On Approval of the State Strategy for the Development of Education in the Republic of Azerbaijan" and important provisions of the law is important. The issues raised in these documents are important in terms of stimulating the development of scientific and technical human resources.

At present, one of the important tasks facing our country is to develop scientific and technical human resources in accordance with the requirements of the national economy, taking into account the provisions and principles of the Law "On Science", and to develop scientifically based proposals and recommendations. is to achieve their implementation. It should be borne in mind that the loss of scientific and technical human resources is difficult to recover and takes a long time.

The collapse of the Soviet Union has led to a decline in the human resources of the economy, science and education of the Republic of Azerbaijan, and a fundamental crisis has arisen in the field of science and scientific services in our republic. Thus, the application of the results of scientific research and development to production has decreased, scientific organizations have lost traditional sources of funding, and human resources have been weakened. Compared to other sciences, the chemical industry and its scientific and technical potential have suffered more. As a result, there are many problems in this area.

It should be noted that the chemical and petrochemical industry in Azerbaijan has developed rapidly since the 60s and 70s of the twentieth century, the field of scientific and technical research in this field has emerged in the country, scientific innovations of Azerbaijani scientists and researchers have been recognized abroad. By the time Azerbaijan regained its sovereignty, chemical and petrochemical enterprises produced more than 160 products.

The flow of human resources operating in both production and research institutions has reached an intensive level. Thus, according to the statistics of 2020, the average annual number of employees in the chemical industry was 10.9 thousand in 2005 and 7.1 thousand in 2018. During these years, the share of field workers in the total number of employees in chemical enterprises was 6.15% in 2005 and 3.4% in 2018. The reduction of human resources in this area will cause a number of problems in the future.

There is a great need to build a modern petrochemical complex that meets the growing demand for petrochemical products in the world, expanding the range of chemical products and increasing

export products. It is the existence of many problems in the chemical industry that hinder the development of chemical scientific and technical human resources, the decline in the prestige of scientific work in research institutions, the decline in interest in fundamental research, the weakening of many research institutions, the influx of scientific and technical personnel. had a negative impact on the reduction of labor productivity of employees, training and use of scientific and technical personnel potential.

Azerbaijan's chemical industry has now entered a new stage of development, ending a period of stagnation in its development. In this regard, the effective use of existing potential requires the solution of existing problems for the formation of scientific and technical human resources in the chemical industry and the implementation of complex measures for its effective use.

The object of research. The object of research is the human resources of research institutes of the chemical industry of the Republic of Azerbaijan.

Subject of research. Improving the mechanism of effective use of human resources in the research institutes of the chemical industry of Azerbaijan, management, etc. and the study of processes is at the heart of the research.

Aims and objectives of the research The main purpose of the dissertation is to reveal the essence and content of the concept of scientific and technical personnel potential on the basis of research and generalization of theoretical views and scientific approaches on the subject and the collection and processing of numerous official statistics. to analyze and evaluate the current state of formation and use of scientific and technical personnel potential in the chemical industry and to develop scientifically substantiated proposals and recommendations on improving the effective use of that personnel potential.

In order to achieve the goal set in the dissertation, the following tasks were performed:

- The concept of "scientific and technical staff potential" and the definition of its structure;

-scientific - scientific substantiation of the main elements and components of technical personnel potential;

-formation of scientific and technical potential, dynamics, analysis and assessment of the current situation;

- making specific proposals to stimulate the work of scientific and technical personnel in chemical research institutions;

-analysis and assessment of the current state of the scientific-technical training system;

-scientific - efficient organization of technical activity and selection of optimal options;

-preparation of proposals for the training of scientific and technical personnel and the improvement of the mechanism of their effective use.

Research methods. In the research work, using the method of comparative economic analysis, analysis and synthesis, the chemical scientific and technical personnel potential was comprehensively studied, various assessment methods for the organization and management of scientific activity were used according to the concept of measuring human resources in the field of chemistry with resource criteria.

The main provisions of the defense:

1 Analysis of the theoretical and methodological bases of formation and use of scientific and technical personnel potential, the role and importance of science in the socio-economic development of society, the concept of "scientific and technical personnel potential" and the position of scientific and technical personnel potential in the system of indicators.

2. The essence of the potential of scientific and technical personnel in the chemical industry, the features of its formation were studied and the quantitative and qualitative indicators of scientific work were compared.

3. Theoretical and methodological bases of methods and techniques of assessment of scientific and technical personnel potential are shown.

4. The current state of scientific and technical personnel potential in the chemical industry, the formation, structure and

development dynamics of chemical scientific and technical personnel potential are given.

5. Sources of formation of scientific and technical personnel potential in chemical industry enterprises and system of training are indicated.

6. It is proposed to apply the results of scientific research to production and increase their efficiency.

7. The current state of resource provision of chemical scientific and technical personnel in the areas of improving the use of scientific and technical personnel potential in the chemical industry was analyzed, the main directions of ensuring the material interests of chemical scientific and technical personnel, improving the system of training and management of chemical scientific and technical personnel were indicated.

8. In order to improve the use of scientific and technical human resources in the chemical industry, it is proposed to create an innovation-oriented technopartkar.

The scientific novelty of the research is as follows:

- The importance of using the potential of chemical scientific and technical personnel in the development of society is indicated; [10, p. 108]

- The essence, composition and structure of chemical scientific and technical personnel potential are disclosed; [8, p. 283]

- The mechanisms of formation of scientific and technical personnel potential in the chemical industry have been studied; [15, p. 93]

- Interrelation of scientific and technical potential of the chemical industry with the potential of scientific and technical personnel of other fields and economic significance have been determined; [13, p. 84]

- Methods and techniques for assessing the formation and use of chemical scientific and technical personnel potential are studied; [14, p. 363]

- Optimal ways to improve the mechanism of training chemical, scientific and technical personnel potential are shown; [15, p. 93]

- Improving the activity of chemical, scientific and technical human resources, stimulating their use, determining the optimal structure and giving concrete proposals to increase the efficiency of scientific work. [31, p. 207]

Theoretical and practical significance of the research. The results obtained in the research process and the proposals and recommendations put forward can be used in the development of programs for the development of the chemical industry, scientific organizations and universities, training and improving the potential of chemical science and technology.

Approbation and application. The main provisions of the dissertation, the results obtained, proposals and recommendations were presented at national and international scientific-practical conferences, collective monographs, magazines and conference materials published by the Institute of Economics of the Azerbaijan National Academy of Sciences, "Dedicated to the 90th anniversary of National Leader Heydar Aliyev ”Materials of the I International Scientific Conference of Young Researchers, April 25-26, Baku - 2013 Qafqaz University, International Scientific-Practical Conference on“ Development Directions of Civil Market Economy Relations ”Dedicated to the 91st Anniversary of National Leader Heydar Aliyev, Baku - 5.6. May 2014, Baku Business University, IV International Scientific Conference of Young Researchers dedicated to the 93rd anniversary of the National Leader of the Azerbaijani people Heydar Aliyev, Qafqaz University, Baku, April 29-30, 2016, 92nd Birthday of the National Leader Heydar Aliyev Proceedings of the International Scientific-Practical Conference on "Political Aspects and Economic Efficiency of Investments", Baku, 5.6. May 2015, Ministry of Education of the Republic of Azerbaijan, Ganja State University, Actual problems of modern natural and economic sciences, International scientific conference dedicated to the 95th anniversary of national leader H. Aliyev, Part IV 04-05 May, Ganja, 2018 has been. Abroad, (Actual problems of economics and improvement of legal regulation in the economy, part 2, Pyatigorsk, 2009), November 18-19, 2010. Minsk, Belarus, Session 9, "Modern problems of innovation and strategies to increase the effectiveness of

scientific and technical potential in Azerbaijan" (Journal "Economics and Entrepreneurship" №6, 1 h., P. 72. 2015), "Scientific - Technological" and issues of personnel training "(Journal" Economics and Entrepreneurship "№ 6, 2 ch., p. 89. 2015).

The main ideas and results of the dissertation have been published in 42 scientific articles and theses in the country and abroad, and the main results of the research are the reference to the use of editorial reports by the Republic of Azerbaijan on "Improving the Use of Scientific and Technical Staff in Chemical Industry". .2012, No. 11/119).

Organization of the dissertation work, Institute of Economics of ANAS

The structure and scope of the dissertation. The dissertation consists of an introduction, three chapters, a conclusion and a list of references. Introduction - 61 516 characters, Chapter II - 81 496 characters, Chapter III - 67 492 characters, result - 11.470 characters, list of used literature - 19 265 characters. The dissertation consists of 4 schemes, 16 tables, 4 diagrams, 1 picture, the total volume is 142 pages, 273 281 characters. The dissertation consists of 238,000 characters, excluding diagrams, tables, diagrams, pictures and bibliography.

THE CONTENT OF THE DISSERTATION

MAIN SCIENTIFIC PROVISIONS PROVIDED FOR DEFENSE

Provisions 1. The analysis of theoretical methodological bases of formation and use of scientific and technical personnel potential, the role and importance of science in social and economic development of society, the concept of "scientific and technical personnel potential" and the scientific and technical staff potential in the system of indicators.

The theory of human capital emerged as a result of research by American economists in the 1950s and 1960s. The term was first used by Theodore Schulz in 1961. After 1965, Harry Becher further developed this idea, based on the effectiveness of investment in human capital and the formation of an economic approach to human behavior. Harry Becer was awarded the Nobel Prize in 1992 for this idea and activity.

Corresponding member of ANAS, i.e.d., professor Sh.M. In the monograph "Human potential: main trends, realities, problems" Muradov summarizes the formation of human potential in Azerbaijan over the past 106 years (1897-2003), showing that the provision of scientific activities with high-level knowledge and skills, increasing the production of material and spiritual values in society is one of the most important factors influencing. One of the main features that distinguishes the field of science from other fields is the concentration of people with different thinking, thinking and intellect.[1]

Many reforms are being implemented in the Republic of Azerbaijan to develop the potential of scientific and technical personnel. These reforms form the basis of the socio-economic development of the Republic. Human resources are one of the key factors determining the future of countries. Taking into account this factor requires special attention to the development of human resources in the chemical industry. Development of human resources

[1] Muradov Ş.M. “Human potential; main trends realities, problems, Baku- "SCIENCE", 2004, 487 p.

is one of the main priorities of state programs implemented in Azerbaijan. At present, special attention is paid to the formation and development of human resources in Azerbaijan. Each of the socio-economic reforms implemented in our country has served the interests of the Republic of Azerbaijan. From this point of view, the policy of successful economic reforms carried out in our country gives grounds to say that most of the revenues are directed to the training of human resources.

Provisions 2. For the first time the theoretical - methodological basis of the scientific and technical personnel potential in the chemical industry, its essence, and features of its formation were compared and quantitative and qualitative indicators of scientific work were compared.

Areas where the scientific and technical potential of the chemical industry is formed, 11 higher education institutions operating in the country and the Department of Chemical Sciences of the Azerbaijan National Academy of Sciences. Some of the specialists trained in higher education institutions improve their skills in the Department of Chemical Sciences. Currently, specialists in 3-4 specialties are being trained in higher education institutions for the fields of chemistry. If we look at the statistics, we see that the number of students studying at the bachelor's and master's levels is a minority in chemistry.

The departure of highly qualified specialists from their field of specialization, and sometimes their departure from the country, has a negative impact on the level of development of scientific and technical human resources. "Brain flow" has a very negative impact on the level of ETP in the country. According to statistics, an average of 262 people (5240 people in 20 years) of doctors and candidates of science go to a foreign country or other fields in Azerbaijan every year.[2]

The scientific and technical personnel potential of the chemical industry, being a driving force of the economy, requires the study of

[2] http://www.baymedia.az/news.php?id=36338#.WulxBaSFPYA

scientific and theoretical aspects of the mechanism of effective use of scientific and technical personnel potential.

Provisions 3. The theoretical methodological foundations of the methods and methods for assessing the scientific and technical personnel potential are shown.

A scientific indicator is used to characterize the effectiveness of science. To calculate this indicator, the funds spent on research and development should be divided by the results of activities. This indicator is calculated at the level of the enterprise, industry and the economy as a whole (micro, macro, meso,), allows you to analyze the progress of the structure of the economy, the scientific and technical condition of production. At the macro level, a science-based indicator is the ratio of research and development expenditures to GDP. This indicator shows the country's efforts in the field of science and technology for national purposes.

In previous studies, the methods and techniques of assessment of scientific and technical potential were based on the concept of measuring the potential of scientific and technical personnel by resource criteria, and specialists used various assessment methods in the organization and management of scientific activity.

In modern times, various indices have been proposed to assess the activity of researchers, the potential of scientific and technical personnel, the quality of works. In the last 5 years, many scientific societies have shown great interest in the index introduced by George Hirsch in 2005. The Hirsch index laid the foundation for the development of various types of indices for the evaluation of scientific activity. This index reflects several positive features. Other scientific literatures also use the Human Development Index.

Provisions 4. For the first time, the current state of the formation of scientific and technical personnel in the chemical industry, the formation of the scientific and technical personnel potential of the chemical industry, the analysis of the dynamics of the structure.

The formation and development of chemical science in Azerbaijan, a rich oil country, arose out of objective necessity and developed rapidly during the USSR. Development of scientific and technical potential of the chemical industry in Azerbaijan (ETKP) Well-known Russian scientists D.I. Mendeleyev, V.V. Markovnikov,

N.D. Zelinski, B.A. Kazanski, A.A. It is associated with the names of Baladin and others. The scientific ideas of the works of these scientists formed the basis of chemistry and petrochemistry. Before the revolution, the first chemist of Azerbaijan was Movsum Khanlarov, who brought the name of Azerbaijan to the world science in the XIX century and introduced our country to Western Europe with his scientific achievements.[3]

In order to develop the potential of scientific and technical personnel in the chemical industry in the Republic of Azerbaijan, the level of scientific research must meet international standards. In other words, the main way to develop this field is to establish contacts with science centers and make it an integral part of these fields. From this point of view, it is expedient to make effective use of the existing potential of the research areas of the chemical industry.

Provisions 5. The sources and the system of training scientific and technical personnel potential in the chemical industry are shown.

The potential of scientific and technical personnel in the field of chemistry is divided into the staff working in the industry and the potential of scientific and technical personnel. The potential of scientific and technical personnel in this field includes scientists, engineers, workers engaged in the training of scientific and pedagogical staff, workers, employees of scientific research institutes, universities and other scientific institutions. Personnel potential in the chemical industry is mainly determined by the number and structure of employees in three areas: research and development, the share of those with a scientific degree in the structure of researchers.

In 2018, 133 research institutions will carry out scientific research and development in our country. 88 of them are scientific research, 39 are higher education institutions, 6 are other organizations. The number of employees engaged in research and development is 11,737 women, 20,179 people.[4]

[3] Khalilov A. "We live in the age of chemistry", Baku "Maarif" publishing house, 1982, p.-75

[4] State Statistics Committee of the Republic of Azerbaijan, Baku - 2019, p. 319.

In 2018, 769 scientists work at KEB institutions, of which 109 are doctors of sciences and 307 are doctors of philosophy. There are 12 full members and 17 corresponding members of ANAS within the department. 45 doctoral students are studying at the institutes of the department for the preparation of the Doctor of Philosophy program in the field of training scientific personnel. In the 2018-2019 academic year, 15 people were admitted to the scientific institutions of the department for master's degree, 24 doctoral and 6 doctoral dissertations were defended, 10 philosophies and 3 doctoral dissertations were recommended for defense.[5]

Table 1.

Human resource potential in the general economic indicators of the chemical industry in the Azerbaijan Republic [6]

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Number of Employed Employees in Industry (percent)	4.8	4.4	4.2	3.8	3.3	3.3	3.2	5.2	3.4
Average monthly salary of one employee	351.8	357.0	453.3	460.4	489.1	640.4	718.8	789.2	843.7
Number of hired workers in the chemical industry (ths. Persons)	8.7	7.7	7.6	7.5	6.5	6.2	6.0	10.2	7.1
Number of hired workers in the chemical industry Compared to the previous year %	94.6	88.5	98.7	98.7	86.7	95.4	96.8	171.8	69.9
Number of registered individual entrepreneurs to carry out industrial activity, person	90	98	106	90	98	105	111	115	131

Source: The table is compiled by the author on the basis of https://www.stat.gov.az/source/industry/5.2/.

[5] Report of the Presidium of the Azerbaijan National Academy of Sciences, Activity of the Scientific Departments of ANAS on Fields and Directions of Science in 2018, Volume II, Baku 2019, p. 254 (p. 53)

[6] https://www.stat.gov.az/source/industry/5.2/.

As can be seen from the table, our country, after gaining independence, by 2016, 17.2 thousand people moved to other areas. As a result, the volume of production and, accordingly, the number of employees decreased by 2016. The number of employees in the chemical industry was 6.0 thousand in 2016, while in 2017 it was 10.2 thousand. In 2017, the number of employees increased by 4.2 thousand people. The main reason for this was the increase in production. In 2018, the number of employees decreased to 7.1 people. There are many reasons for this contradiction, one of which is the inefficient use of scientific and technical human resources.

The specialties related to the chemical sciences are fully or partially included in the sections "engineering", "energy", "chemical engineering" and "computer science engineering". For this reason, the field of chemical engineering is the fifth largest in Azerbaijan in terms of "scientific output". However, taking into account the indicators of world-class science and education centers, we can say that the quality of training in this field is low.

Provisions 6. Analysis of the application of the results of research to products and increasing their effectiveness.

The application of scientific and technical achievements to production covers three areas: "Science", "Production" and "Consumption". "Science" combines three stages: fundamental research, design and technological development. The "production" area covers two stages: the development of a new product and the production of that product. The purpose of the mastering phase is to create conditions for the start of production. Third, it covers the implementation of a new product and its operation.

Table 2

Amount of funds allocated for science in Azerbaijan (million manat)[5]

	2013	2014	2015	2016	2017	2018
GDP (million manat)	58182.0	59014.1	54380.0	60425.2	70135.1	79800.0
Budget Expenditure (million manat)	117.0	124.2	113.2	110.2	109.8	128.2
The percentage of funds allocated for science in GDP	0.20%	0.21%0	0.20%	0.18%	0.15%	0.16%

Source: The table is compiled by the author on the basis of https://www.stat.gov.az/source/industry/5.2/.

The analysis of the table shows that the funds allocated for science in 2018 were 18.4 million manat more than in 2017. It is considered expedient to increase funding for science in the future.

In 2018, research was conducted on 43 topics covering 12 problems in scientific institutions of KEB of ANAS and 2 topics were completed. At the same time, 14 important scientific results were obtained in the field of fundamental and applied research in scientific research, higher education and field institutions, which are not included in the scientific institutions of KEB. This work is a minority in terms of modern requirements.[5]

Table 3

Work done on the basis of economic contracts in scientific research institutions of the Department of Chemical Sciences.[5]

Names of scientific institutions	Budget financing (million manats)	Extra-budgetary funds (manats)
Institute of Petrochemical Processes	4 361 750	252 000
Institute of Catalysis and Inorganic Chemistry	3 683 147	1 500
Institute of Additive Chemistry	1 614 324	84 487
Institute of Polymer Materials	1 524 137	-
Total by section	11 183 359	337 987

Source: Table Report of the Presidium of the Azerbaijan National Academy of Sciences, Activities of the Scientific Departments of ANAS on Fields and Directions of Science in 2018, Volume II, Baku 2019, p. Compiled by the author on the basis of 254 (53 pages).

According to the 2018 International Scientific Indexing (ISI) database, the impact factor of 0.248 was approved for the Journal of Petrochemistry and Oil Refining Processes (E-ISSN: 2519 - 2876, www.ppor.az). At the same time, the scientific institutions of the department filed 30 applications for patents and received 29 patents. In 2018, scientists of the Department of Chemical Sciences published 9 monographs and books, 1147 articles and theses (289 of them in journals of impact factors, 130 were included in the database of Thomson Reuters).[5]

From 1979 to 2018, the Institute of Catalysis and Inorganic Chemistry 558, the Institute of Petrochemical Processes 250, the Institute of Additive Chemistry 250 scientific works were included in the WoS database, the Institute of Catalysis and Inorganic Chemistry

for 2018. The total number of researchers was 290, the number of articles was 62, the total number of researchers at the Institute of Petrochemical Processes was 299, the number of articles was 29 scientific works. As of April 22, 2019, the Institute of Petrochemical Processes is in the fourth place in the ranking of institutions according to the "H" index and the general reference index in the WoS database.[5]

In order to determine the structure of scientific institutions in the Republic of Azerbaijan, conduct and finance research at the level of modern standards, increase the country's scientific potential and strengthen its social protection, implement a national strategy for the development of science as a whole and accelerate the integration of Azerbaijani science into the international scientific space. It is very important to prepare at the level of the requirements of the time.

Provisions 7. Modern trends in the provision of resources for the scientific and technical personnel in the areas of improving the utilization of scientific and technical personnel potential in the chemical industry, the main directions of ensuring the material interests of the chemical scientific and technical personnel, the directions of improving the system of preparation of scientific and technical personnel.

The characteristics of scientific activity should be taken into account when classifying the services of chemical scientific and technical personnel potential. From this point of view, the principles and types of grouping of scientific services can be specified as: science and education, scientific and technical, innovation, intellectual activity, information technology services, information activity, electronic products and services sector, science-intensive services.

The expansion of cooperation between the chemical industry park and research areas should be considered a very important issue. In this case, the use of the Japanese or US model will lead to the study of the experience of these countries, the improvement of the scientific and technical potential of chemistry and increase the efficiency of production.

Provisions 8. In order to improve the utilization of the scientific and technical personnel potential in the chemical industry, it was proposed to create an innovative technopark.

Specialists on scientific degrees the specialties on scientific degrees in the field of chemistry in the Republic of Azerbaijan, supplemented by the decision of the Presidium of the Supreme Attestation Commission under the President of the Republic of Azerbaijan dated April 13, 2012 and October 30, 2015 are: macromolecular chemistry, nuclear chemistry, organic chemistry, physical chemistry, electrochemistry, chemistry of element-organic compounds, colloid chemistry, petrochemistry, chemical kinetics and catalysis chemistry, nanochemistry and nanomaterials chemistry, chemistry and technology of composite materials, analytical chemistry, inorganic chemistry. At the same time, there is a great need for specialties in theoretical chemistry, organic chemistry, biochemistry, inorganic chemistry and geochemistry.

Azerbaijan produces oil, gas, etc. has a developed industrial potential for the production and export of natural products. The situation with the distribution of scientific and technical personnel in the field of chemistry is a matter of serious concern. It is the development of this field, the implementation of measures that meet the latest achievements of science that can solve the important issues ahead. The system of training scientific and technical personnel in chemistry, personnel management, comprehensive professional development must be built on the basis of new requirements.

Science and scientific activity interact and lead to the creation of new scientific knowledge. A. Forti rightly noted that the implementation of the results of scientific activity has a very strong impact on the social and economic sphere. Scientific - research works conducted in chemical industrial enterprises lead to the development of production. This is possible in many economic fields, by taking into account the indicators that characterize scientific research, in the consistent solution of the issues of elimination of the encountered problems. For this reason, it is very important to ensure the economic efficiency of research conducted in chemical research institutes. In order to ensure the socio-economic

development of the country in terms of the requirements of the modern era, it is necessary to make maximum use of the achievements of chemical science, to scientifically update the activities of scientific and research institutes, and to reconstruct the activities of design and construction organizations.

In order to eliminate the problem of chemical industries, all opportunities of scientific-technical personnel potential should be used effectively. Currently, scientific-technical personnel potential is not fully used in this area. Researches show that the development of science in recent times was mainly not due to past achievements, but due to the creation of new scientific departments and increasing the number of scientific workers. For the development of the chemical industry, the acceleration of scientific and technical processes depends on the high level of application of scientific works to production. The efficiency indicator of the works carried out in chemical industrial enterprises depends on the successful application of the results of selected research works in production. Increasing the efficiency of the production of chemical products has led to social and economic development. has played an important role in the fields.

Each chemical experiment carried out in the chemical laboratories of scientific research institutes can be more or less effective. This can be characterized by the fact that the results of this work can be successfully applied to production. It is after the application of research to production that enterprises accelerate the conclusion of new, profitable contracts with customer organizations. These contracts should be implemented on the basis of a farm contract. At this time, interaction between the scientific-research institute and the design bureau should be ensured. Increasing the material and technical level of scientific and research institutes is observed more often. On the other hand, by improving the quality of scientific works, it is possible to increase its economic, technical and social efficiency.

By providing scientific institutions with new technologies, by increasing the interest of scientific and technical personnel in this field, by developing related scientific fields, the

development of scientific-technical personnel potential in the chemical industry can be achieved. It is from this point of view that the process of updating the directions of scientific activity of scientific research institutes and laboratories in the chemical industry is necessary. In this area, by effectively using all the resources of scientific-technical personnel potential, it is possible to accelerate scientific and technical progressand increase its role in public production. After the chemical industry is completely self-sustaining and self-financing, domestic and foreign investments in this field can be divided into practice areas.

The novelty of the activity of scientific research institutes, in principle, depends on the use of research results on a wider scale. At the same time, modern integration conditions allow mutual cooperation with scientific and research institutes of other developed countries.

The development of the chemical industry leads to the expansion of the scope of scientific-technical personnel potential, the establishment of scientific and research relations with other organizations. It is necessary to implement this process under state control and expand existing relations in the field of determining research directions. On the other hand, it should be ensured that the quality of scientific research is improved, and that science-intensive products are of high quality. The quality control of food products and the production stage of pharmaceutical products are of great interest. Almost no research work is carried out in the field of chemical research in this field.

In modern times, the development of the chemical industry is highly dependent on the application of scientific-research works to production, using the full potential of scientific-technical personnel potential. For this, to improve the activity of scientific, management and organizations, it is necessary to finance it from the state budget in the field. With a part of the revenues received from the oil sector in our country, great success can be achieved in the chemical industry in the future.

In addition to being very important, the application of scientific research to production in chemical industrial enterprises is

also profitable. The application of scientific work to production leads to the realization of a scientific-technical product, which, in turn, provides additional profit by covering the expenses incurred for the experiment. This profit serves to increase the budget revenues of the enterprise and the state.

In modern conditions, the fundamental acceleration of scientific and technical progress in the chemical industry is the main issue of economic strategy. Since the equipment of the chemical industry is very old, and the technological processes carried out do not meet world standards, the quality of the products released in this field is low.

In chemical enterprises, the achievements of scientific and technical progress in the world are not effectively used, the results of scientific research are not applied to production, scientific research, inventions and discoveries, and in general, the economic activity of all enterprises are not taken into account, causing new problems. That is why, in order to eliminate the problems that have arisen, the skills and scientific experience of personnel should be widely used in the development of scientific and technical progress in chemical enterprises. For this, it is necessary to create an innovation agency of scientific research.

The social-economic efficiency of the results of the scientific research works applied in the industry is compared with the profits obtained from the application of these research works to production. It is possible to determine the growth of public labor productivity and national income due to the application of individual scientific works to production. It is appropriate to use all the methods and tools applied to production in this field, which increase the social and economic efficiency of scientific work.

CONCLUSIONS AND RECOMMENDATIONS

The low share of funds allocated for scientific research in GDP leads to a decrease in the potential of scientific and technical personnel, which has had a negative impact on obtaining high levels of scientific results. Expenditures on education from the budget in 2016 increased by 38% compared to 2010. In 2017, 1859.5 million

manat was allocated from the state budget for education, which is 146 million manat or 8.5 percent more than in 2016. Funds allocated for education make up 11.2 percent of the state budget expenditures. In this case, the level of funding for education should be 7% of GDP, 6% for health and 3% for science. The reforms carried out in accordance with the Development Concept of the President of the Republic of Azerbaijan "Azerbaijan 2020: Vision for the Future" dated December 29, 2012 also require the transition from a traditional economy to a "knowledge economy".

1. The potential of scientific and technical personnel is not used effectively in the chemical industry. It is from this point of view that the flow of personnel has become systemic.

2. The reduction of human resources in the chemical industry for many years shows that this field is not used effectively.

3. In scientific-research institutions, the acquisition of scientific degrees by staff and their provision with relevant jobs are not carried out in parallel.

From this point of view, it would be expedient to develop priority areas in the field of chemistry and implement these proposals:

- There is a great need for specialties in medical chemistry and food chemistry, and it would be expedient to train these specialties in higher education institutions.

- In order to improve the financial provision of science, an incentive environment should be created for the private sector, local enterprises and companies, foreign companies to invest in research, and a program of special measures should be developed in this direction.

- For the development of chemical, scientific and technical human resources, a system of personnel management, comprehensive professional development should be established on the basis of new requirements, and the gradual increase in the number of employees and researchers with the status of researchers will have a significant impact on improving the quality of scientific results.

Chemistry in Azerbaijan will lead to the formation of scientific and technical human resources in terms of modern requirements,

improve the quantitative and qualitative composition, provide resources, efficient use, increase the socio-economic importance of chemical science, improve the living standards of the population.

The research results of the dissertation are summarized. Suggestions of scientific and practical significance on improving the use of scientific and technical human resources in the studied industry are reflected in the provisions.

The main content of the study is reflected in the following scientific publications:

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