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Formation of innovative type of employment

Abstract

Object: To consider theoretical and methodological approaches to the formation of innovative-type employment of the population.

Methods: Comparative analysis methods were used during the study.

Results: The article defines the interaction of factors of innovative and technical development in the formation of innovative type of employment. The result of the introduction of innovations in production is the predominance of people with a high level of education and professional qualifications in the labor market, which, in turn, forms an innovative type of employment of the population.

Conclusions: The state policy today is aimed at supporting the employment of the population by implementing the main directions according to the state and regional programs in order to prevent social tension in society. State institutions need to develop a regional employment policy aimed at increasing intellectual potential, developing an innovative environment, and activating employment in an innovative economy.

Keywords: innovations, employment of the population, national innovation system, innovation potential, information and communication technologies, digital working, teleworking.

Introduction

Innovations, scientific and technological progress at the present stage have become the main factors of economic growth for many countries of the world; they make it possible to maximize the satisfaction of society and the population in various types of products and services, while significantly saving natural resources, raw materials and supplies, which lead to a profound transformation of production.

The term “innovation” is the key in the concept of the formation of innovative employment and has integrated a number of classic works of economic theory, for instance, the works of J. Schumpeter and N.D. Kondratyev. In Kazakhstan, the issues of innovative development are widely considered in the works of domestic scientists such as Sabden O.S., Dnishev F.M., Nurlanova N.K., Alzhanova F.G., Kenzheguzin M.B., Alimbaev A.A., Taubaev A.A., and others.

Innovation and information and communication technologies (ICT) are engines of socio-economic development that meet the needs of society for all kinds of products and services, while saving resources and materials, which have a fundamental impact on the labor market.

Innovation is a factor influencing the labor market in order to attract labor resources to production through the accumulation of knowledge and distribution in labor products. Innovation potential will be able to fully develop the growth of new technology and employment opportunities with a focus on product innovation (Vivarelli, 2012).

Literature review

A plenty of famous scientists, such as J.M. Keynes, A. Pigou, D. Ricardo, K. Marx, A. Marshall, and others study the influence of technological processes on employment. The main provisions of the neoclassical theory of general economic equilibrium and its constituent elements-theory marginal productivity, equilibrium prices formed the basis of the analysis of labor and still serve as its theoretical foundation. Such the

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most complete analysis was made by the founder of the Cambridge School, A. Marshall, and then supplemented by his students and followers — A. Pigou and J. Hicks.

Russian author Sankova L.V., who considers a new type of employment “newly emerging or advanced, improved types and forms of labor activity based on the use of innovative potential, implemented by labor market actors and contributing to the achievement of productive and efficient employment” (Sankova, 2008).

Other foreign authors such as M. Baltserovich — Shkutnik, E. Soyka, V. Shkutnik consider the impact of innovation on employment from the perspective of reduction and compensation. In the event of a decrease in employment, they assume the replacement of human labor by capital as a consequence of a reduction of labor force. In the case of compensation for employment, innovations neutralize the decline in the labor market (Baltserovich — Shkutnik et al., 2016).

Methods

The main provisions of the neoclassical theory of general economic equilibrium and its constituent elements—theory marginal productivity, equilibrium prices formed the basis of the analysis of labor and still serve as its theoretical foundation. A. Marshall's approach to the analysis of economic phenomena is predominantly microeconomic; he examines the operation of the law of supply and demand in individual commodity markets, including the labor market, where he studies the formation of demand, labor supply, price mechanisms for self-regulation of full and rational use of labor resources. Marshall also considers labor demand in close relationship with material factors and the technology used.

He examines the factors of production, in his terminology, as a capital and labor, complementary and interchangeable (to a certain extent) with each other, so that for the production of a given quantity of certain goods, one can choose different combinations of factors that give the same result (quality of goods, profitability). Marshall considers the complementarity of the production and labor means to be the great principle of substitution, and assigns the role of a conductor to entrepreneurs. He emphasizes the relativity of interchangeability noting that, in some cases, the demand for workers in certain professions is determined by the available equipment and technologies (Marshall, 2012).

If we consider from the standpoint of a change in technological structures, according to Kondratyev, the factors of economic growth are depleted in a downtrend, which affect the unemployment rate, the technologies of the next cycle form new areas of activity and, as a consequence, the demand for labor. Some scientists believe that the new way of the activity will be based on the interaction of nano, bio, IT, and cognition (NBIC) (Zemtsov, 2012).

The main characteristic of this paradigm will be smart systems in the functioning of which the participation of people will be reduced. The problem of human participation in artificial intelligence systems, IoT, etc. touched upon in the scientific works of many economists. If earlier we observed the use of mechanical tools in some sectors of the economy, then, according to the Russian scientist Baburin, in the boundless future we will form a new way of life by 2035 (Baburin, 2010).

Innovative employment becomes a reflection of reality for countries that have chosen an innovative path of development, which is influenced by both the market and public policy. Employment indicators are one of the key indicators of economic development.

In turn, the trajectories of employment development include: the main parameters of the economic environment, human resources, human capital development, training and advanced training of personnel. The acquired knowledge of human potential is a source for the formation of innovative employment.

In the conditions of an innovative economy, production is being improved, new information technologies are being introduced, business processes are being automated, artificial intelligence and big data are used, the management of which rests on skilled labor, and low-skilled labor is being squeezed out.

Labor market employment is determined by qualitative characteristics such as competence, skill capacity, and labor productivity, as reflected in the creation and processing of information and the emergence of “digital” labor.

Results

In general, the share of the labor force with higher and incomplete higher education is increasing in Kazakhstan (in 2017 — 39.2 %, in 2018 — 40.1 %, in 2019 — 38.9 %, in 2020 — 42.4 %) (Bureau of National statistics, 2021).

If we consider the experience of foreign countries to build innovative employment for Kazakhstan, in particular for an industrial region, such as the Karaganda region, it is enough to look at the data on the structure of employment by education. In Table 1, we see a decrease in the number of employees with higher and incomplete higher education over the past 2 years. At the same time, a number of graduates with secondary vocational (special) education, increased to 43 % of the total number of employees in Karaganda region in 2019.

The influence of innovative development becomes noticeable with changes in the structure of employment by type of economic activity, which, in turn, reflects the requirements of employers to applicants from the perspective of employee qualifications. The demand for low-skilled personnel is decreasing and, on the contrary, it is increasing for highly-qualified workers.

Table 1. The structure of employed persons by education in the Karaganda region (in thousand people).

year	Higher and incomplete higher	Secondary vocational (special)	Basic, secondary, general, initial
2013	227 241	243 506	236 451
2014	226 139	253 826	198 422
2015	242 993	225 223	201 793
2016	241 843	241 198	173 379
2017	230 060	259 631	162 661
2018	228 767	285 171	140 049
2019	207 304	281 138	160 492

Note — Compiled by author according to the source

Analyzing the structure of the employed population depending on the type of economic activity in the Karaganda region shown in Table 2, the predominance of employees in the field of administrative and support services can be argued. By a small margin, the number of people employed in electricity supply and in industry reflects the specifics of the country's industrial region.

In turn, we can agree with the opinion of M.V. Baranova, who claims that the formation of innovative employment requires a set of solutions for state regulation of the employment policy of the region, in building up human capital, in improving the national innovation system, etc. In this regard, the process of management and formation of innovative employment type (Baranova, 2006).

Therefore, government agencies need to develop a regional employment policy aimed at increasing intellectual potential, developing an innovative environment, and enhancing employment in an innovative economy.

Table 2. Employed population by type of activity (in thousand people).

Economic activity	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Agriculture, forestry and fisheries	118155	109650	88311	68208	13663	34737	32729	31369	31294	30640
Industry	177590	177735	181186	19410	179391	174982	175805	171252	176751	179077
Mining and quarrying	19548	21636	29414	6290	52615	49289	53020	55673	60325	59892
Administrative and support services	17265	15904	13990	2920	13598	18496	19651	19812	18491	18994
Manufacturing industry	138078	132430	122949	4264	96566	96748	92700	90842	90287	91725
Electricity, gas, steam and air conditioning	14752	17037	21764	4344	21105	20602	20991	17360	18714	18844
Water supply; sewerage system, control over the collection and distribution of waste	5212	6632	7059	4512	9105	8343	9094	7377	7425	8616
Building	32732	34579	37963	3800	35175	41951	40222	39121	39148	40273
Wholesale and retail trade; repair of cars and motorcycles	111941	101701	96529	4827	76816	101057	97655	84749	95115	94977
Transport and storage	48275	51841	53113	11034	41615	50384	44715	49276	45288	47157
Accommodation and catering services	8066	11498	15345	1476	8355	14579	13813	13291	15559	14796
Information and communication	8314	9422	10311	1521	11098	11631	10858	9706	8034	7719
Financial and insurance activities	6683	7402	8068	836	11278	12986	10084	12271	7691	8588

Note — Compiled by author according to the source

One of the key characteristics of the intellectual potential are acquired skills, individual abilities, professional competencies, and the ability of the employed to respond quickly and flexibly to the ongoing transformations in the world. In recent years, the research potential of universities in China has significantly increased, thereby it makes a significant contribution to the economic development of the country. The innovative ability the Chinese workforce is a major competitive advantage used to build the world's leading technology and industrial systems.

The next factor in building an innovative type of employment is the development of a national innovation system.

According to the Kazakh scientist F. Dnishev, Kazakhstan, unfortunately, lacks a comprehensive vision of innovative development which would take into account the mechanism of interaction and interdependence between various components of the national innovation system (NIS) (Dnishev, 2019).

Another Russian author Khvatova T.Yu. presented the interaction of elements and subsystems of the NIS, which is based on the knowledge generation subsystem (Khvatova, 2009).

Discussion

A characteristic feature of the innovative type of employment is a radical change in the professional qualities of workers with an increase in highly skilled labor.

The global economic crisis caused by the COVID-19 pandemic in 2020, which led to a reduction in employment and a change in its structure all across the world — the transfer of remote workers to the work format (telework), thereby exposing the problems of the digital economy.

In the 2010 US Telecommuting Improvement Act, the term telecommuting refers to the flexibility of a job in which an employee, subject to the terms of employment, works at a distance from the employer's location. At the same time, implying the use of information and technology (Novikova, 2019).

In studies carried out by the International Labor Organization and the Eurofond in 2017, the following types of modern “teleworkers” are distinguished:

- employees working at home using ICT;
- employees working outside the employer's premises using ICT;
- workers performing mixed telework with a low-level mobility using ICT.

Currently, Kazakhstan has not yet approved the regulatory rules for regulating teleworking. We believe this is a matter of time.

M. Baltserovich–Shkutnik, E. Soika, V. Shkutnik (2016) consider the impact of innovation on employment from the perspective of reduction and compensation. In the event of a decrease in employment, they assume the replacement of human labor by capital as a consequence of a reduction of labor force. In the case of compensation for employment, innovations neutralize the decline in the labor market.

In turn, the domestic scientist A.A. Taubaev (2015) confirms in his article that “the principal characteristic of NIS is the central role of enterprises in the innovation process”. For the generation and use of innovations in economic activity, it is necessary, first of all, to have institutions involved in the distribution of innovations, and secondly, to develop and interact with each other. All participants in the innovation process in this interaction of institutions form a system that reflects the specific features of a particular country, which is commonly called the national innovation system.

In the strategic plan of the Ministry of Labour and Social Protection of the Population of the Republic of Kazakhstan (MLSP RK) for 2021–2024, the priorities are defined as ensuring productive employment, qualitative growth of human capital, providing support for entrepreneurship and marginal segments of the population. The ministry also expects that with the modernization of economic sectors, it is possible to increase unemployment and labor flows, which will cause an accelerated structural transformation of employment in the country's economy.

To date, the atlas of updated professions (considering the fourth industrial revolution), in demand on the global labour market, related to robotics, industrial robotics, mechatronic systems and digitalization, etc. is presented.

The MLSP RK in resolving the risks associated with the transformation of the labour market, conducts weekly monitoring of problematic employment issues at the regional level, with the addition of specific measures for each region in the relevant program documents, as well as their implementation, coverage of regional enterprises to manage the flow of the working population.

The “Enbek” program is an additional measure to ensuring productive employment (2018). It includes 4 main areas, such as short-term vocational training and VET, assistance in starting and developing a business

by providing grants and microcredits, providing a “first job”, participation in the project “Zhastar — el tire-gi”. The implementation of these projects is showing its effectiveness, especially during the COVID-19 pandemic.

For example, at the end of 2020, 1083 people were sent to the Karaganda region in the first direction: short-term vocational training and VET, which was an over-fulfillment of 87 %.

The next direction of the Program “Development of mass entrepreneurship” allocated and mastered 5.3 billion tenge. 2 409 self-employed and unemployed citizens were trained in doing business under the “Bastau Business” project, with 34 % over-fulfillment of the plan. Also, the participants of the Program received 1,161 microcredit and 1,531 start-up grants.

In the direction of labor market development, 32,591 people were employed, 779 social jobs were created, 1,436 people were organized for youth practice, and 8,785 people were organized for public works.

While accomplishing the Employment Roadmap in 2020, 622 projects worth 62 billion tenge were implemented with the creation of 16,017 jobs, including employment through Employment Centers of 8,033 people and 503 permanent jobs.

For example, the Employment Centers of the Karaganda region give priority to the employment of unemployed youth for the infrastructure projects being implemented. The share of the local budget in the Employment Roadmap in 2020 was 91.3 %.

According to the Employment Roadmap (ERM), the amount of 22.8 billion tenge was allocated for 2021, of which 21.048 billion tenge was allocated for infrastructure projects (from the government budget (GB) — 4 902.8 million tenge, due to bonds — 16 144.9 million tenge), for microcrediting (GB) — 1.8 billion tenge.

In the Karaganda region, 19 projects were approved (including 13 projects from 2020), including 17 construction projects and 2 projects for the reconstruction of facilities. According to these projects, it is planned to create 425 jobs, including 214 people to be employed through Employment Centers.

Conclusions

Today, state policy is aimed at ensuring productive employment, through the implementation of the main directions in accordance with state and regional programs in order to prevent social tension in society. We hope that these risks in the strategic plan for introducing additional specific measures for each region will be prevented and aimed at solving complex training and retraining of personnel in new professions, at developing the creative industry and entrepreneurial initiative.

Kazakhstan's innovative development should be improved with the cooperation of NIS participants to develop effective mechanisms for building knowledge and developing an innovative environment on the example of foreign countries. All these measures will help to react the rapidly changing conditions in the labor market and to define a new format in the region's development strategy.

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Жұмыспен қамтудың инновациялық түрін қалыптастыру

Аңдатпа

Мақсаты: Инновациялық түрдегі халықты жұмыспен қамтуды қалыптастырудың теориялық және әдіснамалық тәсілдерін қарастыру.

Әдісі: Зерттеу жүргізу кезінде салыстырмалы талдау әдістері қолданылды.

Қорытынды: Мақалада инновациялық түрдегі жұмыспен қамтуды қалыптастырудағы инновациялық-техникалық даму факторларының өзара әрекеттесуі анықталды. Өндірісте инновацияларды енгізудің нәтижесі еңбек нарығында жоғары білім деңгейі мен кәсіби біліктілігі бар адамдардың басым болуы болып табылады. Бұл өз кезегінде инновациялық түрдегі халықтың жұмыспен қамтылуын қалыптастырады.

Тұжырымдама: Мемлекеттік мекемелер зияткерлік әлеуетті ұлғайтуға, инновациялық ортаны дамытуға, инновациялық экономика жағдайында халықты жұмыспен қамтуды жандандыруға бағытталған халықты жұмыспен қамту саласындағы өңірлік саясатты әзірлеуі қажет.

Кілт сөздер: инновация, технологиялық процестер, жұмыспен қамту, ұлттық инновациялық жүйе, инновациялық әлеуеті, ақпараттық-технологиялық коммуникация, сандық жұмыс, тележұмыс.

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Формирование занятости инновационного типа

Аннотация

Цель: Рассмотреть теоретико-методологические подходы к формированию занятости населения инновационного типа.

Методы: При проведении исследования были использованы методы сравнительного анализа.

Результаты: В статье определено взаимодействие факторов инновационно-технического развития при формировании занятости инновационного типа. Результатом внедрения инноваций в производстве является преобладание людей с высоким уровнем образования и профессиональными квалификациями на рынке труда. Что, в свою очередь, формирует занятость населения инновационного типа.

Выводы: Государственным органам необходимо выработать региональную политику в сфере занятости населения, направленную на увеличение интеллектуального потенциала, развитие инновационной среды, активизацию занятости населения в условиях инновационной экономики.

Ключевые слова: инновации, занятость населения, национальная инновационная система, инновационный потенциал, информационно-коммуникационные технологии, цифровая работа, телеработа.

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