Influence of world development trends on changes in the system of higher education in Kazakhstan and Russia

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Abstract. In this article, based on the analysis of global trends in the development of future specialist training, perspective types of production and products (mainly services) that are promising for cross-border areas are highlighted, corresponding to a number of global trends. Based on the analysis of foreign and domestic scientific and practical sources, new educational programs have been identified for some sectors of the economy. The authors also analyze opportunities and necessary resources for further selecting new educational programs and trajectories for training specialists with higher and postgraduate education for its application in a university, taking into account future development needs of specific regions and cross-border economic cooperation, with the Russian Federation in particular.

Keywords: development trend, specialties of the future, educational programs, the need for specialists, digitalization, automation and robotics, demographic changes, network society, greening, technological changes

1. Introduction

The relevance of the topic of this study lies in the fact that to according to the global trends in the training of specialists, a skilled personnel in the field of higher education is necessary in conditions of the ongoing formation of the sixth technological order and the reorganization of the social structure of society.

In this regard, we would like to note that actualization of existing educational programs and development of new innovative and interdisciplinary ones are highly necessary. At the same time, it is important to take into account the needs of not only our own national and regional economy, but also of emerging transboundary economic complexes, especially for the universities located in cross-border territories.

Accordingly, the purpose of this study is to identify and evaluate global trends that determine the need for specialists in order to predict new areas of training at a university. Based on this, the following tasks are set: (1) to determine the nature of the expected changes in the industries and the most promising directions of their development in the future; (2) to identify the key trends determining

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knowledge and skills that are to be in demand in the 21st century; (3) to propose possible new educational programs, directions, and trajectories for training specialists; and (4) to develop proposals for new educational programs for a particular university.

2. Materials and Methods

This study was conducted by the authors on the basis of D. Serikbaev EKSTU (Kazakhstan), using the materials of the Agency for Strategic Initiatives (Skolkovo) [1], as well as the experience of developing innovative educational programs at the AltSU Faculty of Economics (Russia) [2].

Foreign scientific sources, websites of universities in Kazakhstan, websites of universities in the near and far abroad, scientific articles were used in our research. "Atlas of New Professions", "Skills of the Future: What You Need to Know and be Able to Do in the New Complex World" [3], and others are of particular interest.

The study used the following scientific methods: a review of the scientific literature and Internet sources, expert assessments, as well as focus groups. The starting point of our study was the identification of the key trends determining those professions that will be in demand in the 21st century.

3. Results

Initially, processes that change the content of production activities at specific workplaces were subjected to research in order to make a conclusion on new types of activities. Our analysis of foreign sources allows one to highlight the following structure and content of key trends identified by the authors:

1. *Technological: Digitization of all spheres of life.* Digital technologies master new areas of human activity. *Automation and robotization* implies development of autonomous systems capable of complex physical and cognitive actions, transforming traditional specialties in all sectors of the economy.
2. *Social: Demographic changes.* Increasing life expectancy, continuing urbanization, a growing role of women in the economy, and a changing model of childhood define a new social landscape. *Formation of a network society*. The emergence of new, more flexible ways to manage companies and communities is complemented by the development of network technologies and the proliferation of blockchain-based solutions.
3. *Techno-social trends. Globalization* is developing in contradictory processes to liberalization and protectionism, contributes to the formation of regional economic subsystems and markets, including in cross-border areas. Production chains, consumer goods, scientific knowledge, and cultural codes arise and exist in a highly connected world, in which the role of transnational cooperation is enhanced. *Greening.* The growing attention to ecology among consumers and manufacturers is accompanied by the transformation of the very concept of ecology.
4. *Metatrends: Accelerating technological and social change.* All the listed changes occur under the influence of one common metatrend – an increasing rate of change. The pace of change is such that most of the existing economic and social institutions are not ready for innovations.

Given the aforementioned trends, the following segments of the new economy are highlighted [3]:

1. *Growing:* Autonomous cyber-physical production; unmanned vehicles; total connectivity; hybrid reality; localization of production; horizontal control structures; green production and services; highly personalized services, etc.;
2. *Stagnating:* Manual labor in most industrial and many service operations; centralization of infrastructure; management and development; cities as centers of mass industrial production; routine intellectual work and mediation; large-scale industrial productions as large employers; hard boundaries between work, creativity, learning, free time, and life in general. The development of such segments leads to certain changes occurring in various sectors of the economy.

The classification of the three sectors of the economy according to 4 models was developed based on the source [3], and it is presented in Table 1.

Table 1. Classification of economic sectors.

Economic sector	Type	Examples
1	2	3
Industry	Primary Sector	Raw materials extraction, primary processing, production of semi-finished products
	Secondary sector	Manufacturing, construction
Services	Tertiary sector	Services sector, with the exception of those in the Quaternary sector
Knowledge economy	Quarter Sector	Knowledge production, IT, creative sector

As the most promising, we can single out the development of the following industries and types of products presented in Table 2.

Table 2. Perspective directions of production and types of products by sectors of the economy.

Sector	Product type	Production direction	Examples
Industry	Standardized	Cyber-physical production systems	Gigafactories + unmanned logistics + electronic sales
	Customized	Local custom production	3D printing, non-crafting, biohacking
Services	Standardized	Electronic services (figure, VR, AR) with neural networks support	Mass entertainment industry, medicine, accounting, public sector, blockchain registries
	Customized	Human services	Psychotherapy, tourism, fitness, health
Knowledge economy	Standardized	Analysis and production of simple data	Analysts, electronic assistants, neural networks for creating news content, MOOC +
	Customized	Dealing with chaotic information and complex systems	Supersystems - man and computer, curator of social ecosystems, scientist

A clear understanding of the prospects for development, which has become extremely relevant in the current super-dynamic socio-economic situation, allows to use a reasonable approach for the formation of new educational programs, directions, and trajectories.

Further, the selection of promising areas of development in relation to the main areas of training of specialists at EKSTU related to the service sector (financial sector), as well as the economy of knowledge (management) based on the study of foreign and domestic sources [7, 8]. The results are presented in Tables 3-4.

Table 3. A list of possible educational programs for training specialists in the financial sector.

Educational programs (trajectories)	Note
1. Financial engineer	There is an EP called “Financial management of high-tech enterprises” (from 2018)
2. Financial manager	There is a trajectory specialization in “Finance” (Bachelor)
3. Financial analyst	A prepared trajectory specialization in “Finance.”
4. Intellectual property appraiser	At the junction of Finance, Economics, and IT-Technologies.

	To be developed.
5. Manager of crowdfunding and crowdinvesting platforms	Narrowly, at the junction of Finance and Management. The trajectory in specialization for Master's in Finance is possible.
6. Manager of private equity fund investments in talented people	To be developed.
7. Individual financial trajectory designer	To be developed.

Table 4. A list of possible educational programs for training specialists in the field of Management.

Educational programs (trajectories)	Note
1. Analyst (market simulation)	There is a strong need. The trajectory in the magistracy is possible.
2. E-business consultant	There is a trajectory for IT management.
3. Digital marketer / E-commerce marketer	At the junction of Marketing and IT-Technologies. Strongly needed. An EP is possible from 2019.
4. Online sales manager	Narrow specialty.
5. Economist (Cybernetics)	There is a need, an EP is possible.
6. Impression manager / Director of client impressions	In prospect.
7. Personal brand manager / Personal brandmaker	In prospect.
8. Cross-cultural communication manager	In prospect.
9. Time manager	In prospect.
10. Corporate anthropologist	In prospect.
11. Trend-watcher / Foresighter	There is an EP "Foresight – marketing" master.
12. User community moderator	In prospect.

Analysis of expert opinions allowed us to highlight the following programs and trajectories for considering the feasibility and the possibility of opening them at the EKSTU (Kazakhstan) in the very near future (2019-2020 academic year):

1. Digital Marketer/ E-commerce marketer (Bachelor).
2. Environmental auditor / Environmental consultant.
3. Environmental analyst in extractive industries.
4. Energy Management and Sustainability (Master).

In turn, the following undergraduate programs are introduced at the AltSU (Russia): "Bachelor's Program in Radiophysical Technologies in the Digital Economy," "Bachelor's Program in Artificial Intelligence Technologies," "Bachelor's Program in Digital Economy," "Master's Program in Information Security of Banking and Financial Systems", "Master's Program in Physics of Nanosystems", "Master's Program in Neuroinformation Technologies and Robotic Systems", "Master's Program in Neural Networks and Data Analysis". Also, the Master's Program in the Field of Computer Science and Robotics will be available. The following new Master's programs are opening at the Faculty of Economics: "Business and Financial Analytics", "HR-analytics and Personnel Security", as well and "Applied Computer Science in Financial Management".

4. Discussion

The following propositions may be proposed for discussion that constitute elements of the scientific novelty of the research.

First, global trends in the development of specialist training have been identified with the aim of identifying future types of industries and products (mainly services) for cross-border areas that meet global trends. Scientific and practical sources are studied with the aim of identifying promising educational programs in universities for some sectors of the modern economy, taking into account digitalization.

Second, opportunities and necessary resources were analyzed for the further selection of new educational programs and trajectories for training specialists with higher and postgraduate education for implementation at the EKSTU, taking into account the future development needs of specific regions and cross-border economic cooperation.

5. Conclusion

According to the results of the study, we can draw conclusions that the promising segments, production directions, and types of products corresponding to the key trends of the 21st century are quite clearly distinguished in the contemporary economy.

Identification of such areas allows for a reasonable choice of potentially promising educational programs and trajectories for the training of highly qualified specialists in the universities of Kazakhstan and Russia, especially being located in cross-border areas.

The results can be used in the activities of universities in Russia and Kazakhstan, implementing programs of innovative development and international cross-border cooperation, they also have a practical significance for the business community.

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