



LABOR MARKET TRANSFORMATION AND HOW INTERDISCIPLINARITY IS CHANGING THE PROFESSION OF THE FUTURE IN UZBEKISTAN

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Abstract: *The ongoing processes of digitalization, automation, and rapid technological advancement are fundamentally reshaping the demands of the labor market. This paper explores how an interdisciplinary approach serves as a crucial means of responding to these shifts and fostering the development of emerging professions. Special focus is placed on the context of Uzbekistan, examining national strategies, reforms in the education sector, the growth of innovation ecosystems, and the rise of hybrid professions that span multiple disciplines. Drawing on recent global and local trends, the article highlights potential pathways for developing future-ready talent while addressing the main barriers that complicate the transition to an interdisciplinary framework. This study targets researchers, educators, educational administrators, and stakeholders involved in shaping contemporary workforce development policies.*

Key words: *interdisciplinarity, labor market, future professions, innovation, digitalization, Uzbekistan, education, human capital, ICT*

INTRODUCTION

In the context of large-scale digitalization, automation and rapidly developing artificial intelligence, the labor market is undergoing a profound transformation. There is an increasing demand for specialists not only with narrow competencies, but also for those who are able to think more broadly - at the intersection of various disciplines. What is in demand is not specific professions, but skill sets that allow you to adapt, learn quickly and create solutions in an interdisciplinary environment.

Interdisciplinarity is becoming one of the key success factors for both individual career paths and national economic development. This is especially relevant for countries like Uzbekistan, where the course towards innovation and technological renewal requires qualitatively new training of personnel.

Today, Uzbekistan is witnessing attempts to rebuild its educational and economic model with a focus on innovation, flexibility and international competitiveness.

The purpose of this article is to analyze how the interdisciplinary approach influences the formation of new professions in Uzbekistan and how this is related to global and local changes in the labor market.

So what are the trends in the global labor market today?

It is characterized by increased volatility, rapidly changing requirements, and an emphasis on soft skills. Among the key global factors of transformation, four main ones can be identified:



1. Digitalization and automation. The development of digital technologies leads to the displacement of routine operations, both physical and intellectual. Artificial intelligence, machine learning, robotics and “smart” systems are increasingly replacing human labor in the field of production, logistics, accounting and even data analysis. However, in parallel with the disappearance of some professions, others appear - more complex and requiring interdisciplinary knowledge: for example, big data analysts, human-machine interaction engineers [1], [2].

2. Growing demand for soft skills and flexible thinking. Employers increasingly emphasize the importance of skills that go beyond one specialty: the ability to work in a team, creativity, critical thinking, and quick adaptation to new conditions. The ability to see the connections between different areas and integrate knowledge is especially highly valued - which is directly related to an interdisciplinary approach.

3. Moving away from traditional specialization. There is a shift from narrow specialization to so-called T-shaped skills [3] – when a specialist has deep expertise in one area, but also understands related disciplines.

Potential impact of digitalization and AI on key task categories

Task type	Description of the task	Examples of professions	Potential impact
Routine	– Repetitive operations – Can be formalized – Often automated algorithmically	– Call center operators – Cashiers– Transport dispatchers – Entry-level accountants	Extensive automation/replacement of AI (including through chatbots, RPA and neural networks)
Analytical and abstract	– Processing complex information – Decision making – Creativity, dealing with uncertainty	– Data analysts – Product managers – UX designers – Diagnostic doctors	Intelligent complementarity (AI enhances work, but does not replace it completely)
Manual and interpersonal	– Interaction with the physical environment – Working with people – Unpredictability and the emotional component	– Nurses – Drivers in difficult conditions – Teachers – Service workers	Limited automation / human required (AI helps but cannot replace empathy, flexibility, context)

Now let's move directly to the definition of the word "interdisciplinarity".

According to a review in the journal Research Evaluation, interdisciplinary research is defined as: “Any study undertaken by scholars from two or more different scientific disciplines, based on a conceptual model that links or integrates the theoretical frameworks of these disciplines, using a research design and methodology that is not limited to any one field, and requiring the use of perspectives and skills from the disciplines involved at all stages of the study” [4]. This definition is currently considered classic.

A literature review published by Oakland University emphasizes that interdisciplinary learning involves: “The application of methods and approaches from



multiple disciplines to enrich the learning experience and prepare students to solve complex problems" [5], which defines it as an educational practice.

An article published in the journal *Magisteria* notes that interdisciplinarity in the humanities allows apply methods characteristic of one discipline to other areas of knowledge, which contributes to a deeper understanding of the phenomena under study [6].

M.K. Petrov [7] considers interdisciplinarity as a socio-cultural phenomenon, emphasizing its importance for fundamental and applied research programs.

Based on the presented sources, it is possible to create a generalized academic definition of interdisciplinarity that will take into account both theoretical and applied aspects.

Interdisciplinarity— is an integrative approach to researching and solving complex problems that consciously combines knowledge, methods, concepts, and theories from two or more scientific disciplines. It aims to develop new understandings of phenomena that go beyond the boundaries of one area and to facilitate the development of holistic solutions that are resilient to contextual and sociocultural changes.

Interdisciplinarity is applied both in scientific research and in educational practice, strengthening the ability of students and professionals to adapt to the challenges of modern reality, which requires creativity, critical thinking and the ability to collaborate.

Interdisciplinarity in Uzbekistan.

In Uzbekistan, there is an active development of professions at the intersection of various sciences, which is due to the integration of education, science and production. For example, the Center for Genomics and Bioinformatics at the Academy of Sciences of Uzbekistan trains specialists capable of applying methods of molecular genetics and bioinformatics in agriculture and medicine; As part of the national program for the development of school education in Uzbekistan, emphasis is placed on the introduction of the STEAM approach, which combines science, technology, engineering, art and mathematics. This requires training teachers capable of integrating various disciplines into the educational process.

Besides, In recent years, Uzbekistan has demonstrated a steady course towards modernization and development of an innovative economy. This process is accompanied by systemic reforms in education, science, entrepreneurship and digital transformation, which creates favorable conditions for the introduction of interdisciplinary approaches in personnel training and the construction of new industries.

One of the key documents setting the development vector is the Strategy "Digital Uzbekistan - 2030", approved in 2020. It provides for the digital transformation of all spheres of life - from public administration to education and agriculture. Among the target indicators are an increase in the share of the digital economy in GDP, the



development of digital infrastructure and the training of personnel in the field of ICT [8].

Also, an important impetus for development was the creation of the Ministry of Innovative Development in 2017, with subsequent transformation into the Ministry of Higher Education, Science and Innovation, designed to support scientific research, innovative projects and technology transfer.

In order to support and develop the startup ecosystem and digital entrepreneurship, the innovation support infrastructure is actively developing in Uzbekistan: technology parks, business incubators, and innovation clusters are being created. The most notable project is IT-Park Uzbekistan, which acts as a center for the development of startups in the field of information technology. IT-Park combines elements of business education, acceleration, grant support, and entry into the international market; there are industrial zones such as Yashnobod Innovation Technopark, which support developments at the intersection of engineering, agricultural technology, and digital solutions.

Regarding reforms in higher education and increased emphasis on applied research, since 2017, Uzbekistan has been liberalizing the educational sphere: international educational standards are being introduced, branches of foreign universities are being opened, and joint educational programs are being created. Examples include Inha University in Tashkent, Westminster International University in Tashkent, Amity University, etc.

Particular attention is paid to the development of scientific and educational platforms where students and teachers work on real projects related to industrial tasks. These changes contribute to the formation of an interdisciplinary environment in which science, education and production are closely interconnected.

But despite the positive dynamics, the transition to an innovative model faces a number of barriers:

- shortage of personnel with interdisciplinary training;
- limited access to laboratory and digital infrastructure in the regions;
- inertia of academic programs;
- insufficient synergy between universities, business and the government.

Nevertheless, the general direction of the reforms and the high interest in technology on the part of young people create positive preconditions for the sustainable development of an innovative economy.

An interdisciplinary approach opens up significant opportunities for Uzbekistan in training a new generation of personnel and creating a knowledge-based economy. However, to realize this potential, it is necessary to take into account both promising development areas and existing challenges.

Prospects:

1. Growth of in-demand professions at the intersection of disciplines

Among the most promising areas we can highlight:



- Artificial Intelligence and Machine Learning
- Financial technologies
- Ecological engineering
- Digital education
- Bioinformatics

Uzbekistan could become a regional hub for training such specialists, given its young and technology-oriented audience, as well as the growing number of international partnerships in the field of education.

2. Expanding international cooperation

The country's universities are increasingly participating in international educational and research projects, which facilitates the transfer of successful practices and the development of network forms of training interdisciplinary personnel.

3. State support and innovative programs

Existing initiatives (IT Park, accelerators, grants for researchers) are gradually forming an ecosystem in which not only technical but also interdisciplinary talent is in demand.

Challenges:

1. Mismatch between the education system and market needs

Despite the reforms, many educational programs remain focused on traditional disciplines, and students are not always ready for flexible, project-oriented formats.

2. Technological inequality

The large gap between urban centres and regions in terms of access to digital infrastructure and development opportunities is a serious obstacle to a universal, inclusive innovation system.

3. Shortage of teachers with interdisciplinary experience

The transition to integrative learning requires not only a change in programs, but also the training of teaching staff capable of working at the intersection of disciplines.

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