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EVALUATING THE ALIGNMENT OF HIGHER EDUCATION SYSTEMS WITH CONTEMPORARY LABOR MARKET REQUIREMENTS: AN ANALYTICAL PERSPECTIVE

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Abstract.

Purpose. The purpose of this study is to evaluate the degree to which higher education programs in Kazakhstan align with the evolving requirements of the labor market. It focuses on assessing the effectiveness of academic training in preparing graduates for professional practice and in meeting employer expectations, especially in light of rapid technological change, globalization, and shifting economic conditions.

Design/methodology/approach. The study adopts a mixed-methods approach, combining statistical analysis of national graduate employment data, expert evaluations of bachelor programs, and labor market insights derived from the HeadHunter platform. Indicators such as graduate employment rates, median salaries, job-search duration, and curriculum relevance are analyzed to assess the level of alignment between education outputs and labor market demands.

Findings. The analysis shows that programs characterized by strong industry partnerships, practical orientation, and flexible curricula lead to higher graduate employability outcomes. These programs demonstrate better performance in terms of employment rates, job relevance, and career readiness of graduates.

Originality. This research offers both scientific and practical contributions by bridging the gap between academic preparation and labor market requirements in Kazakhstan. It provides new evidence on the role of curriculum adaptability and university – industry collaboration in enhancing employability, thereby informing policymakers, educators, and employers on strategies for aligning higher education with contemporary labor market needs.

Keywords: Higher Education, Labor Market Alignment, Graduate Employability, University-Industry Collaboration.

Introduction

In today's world of rapid technological change and shifting economic conditions, the labor market is placing increasingly complex demands on young professionals. Universities, as the main providers of higher education (THE, 2024), face the challenge of not only teaching core knowledge but also adapting quickly to new skills and professions that are in demand. Understanding how well higher education aligns with these labor market needs has therefore become both a scientific and a practical issue, one that directly affects economic growth, workforce competitiveness, and the effectiveness of public policy.

The importance of this question is amplified by global trends such as digitalization, automation of production, the rise of creative industries, and the overall transformation of employment structures. Under these circumstances, it becomes especially relevant to examine whether academic programs and standards are keeping pace with what employers actually require, as well as with long-term economic shifts (Acemoglu, 2023).

The aim of this study is to evaluate how effectively the higher education system meets current labor market expectations. The analysis draws on international experience, statistical evidence, and leading theoretical approaches from studies indexed in Sco-

pus and Web of Science. The novelty of this research lies in proposing tools and indicators that help measure how adaptable higher education is to labor market changes and in forecasting possible directions for its modernization.

Ultimately, this study seeks to shed light on the relationship between educational development and broader economic restructuring. By doing so, it contributes to more evidence-based recommendations for policymakers and supports the goal of making graduates more competitive at the global level.

Literature review

Contemporary debates on knowledge production and intellectual property increasingly adopt a critical perspective on the capitalist logic that underpins scientific communication. A significant example is the article by S. G. Basilio (2025), which draws on Karl Marx's theory of value to explore how intellectual property rents operate as mechanisms of capital accumulation within the global publishing industry.

Basilio argues that, rather than decentralizing knowledge, the digital revolution has reinforced market concentration and intensified the commodification of academic labor. Researchers occupy a contradictory position: they are both producers, whose rights are transferred to powerful publishing houses, and consumers, who must pay subscription fees or Article Processing Charges to access their own work. Her discussion of the Brazilian higher education system is particularly revealing. She shows how substantial public research funding is effectively redirected to private publishing conglomerates, a process that, in her view, strengthens national dependence on global "mega-publishers" and reproduces structural inequalities between the center and periphery of the international academic landscape.

Other scholarship focuses on the relationship between higher education and the labor market, with growing attention to the influence of social factors on integration processes. D. Lajçi and B. Kuqi (2024), for example, examine how demographic change, cultural norms, and socio-economic conditions shape the expansion of higher education and its responsiveness to employment demands. Employing a mixed-methods design that combines statistical data with qualitative evidence, they identify drivers such as youth population growth, migration trends, and prevailing attitudes toward education. Their findings suggest that successful graduate employment depends not only on aligning curricula with occupational requirements but also on wider

social contexts, including family expectations, gender roles, and regional inequalities.

The global emphasis on sustainable development has also informed higher education research. A.A. Tailakova and colleagues (2024) investigate the role of universities in the Kyrgyz Republic in advancing education for the green economy. They conclude that building human capital for this sector requires ensuring the international competitiveness of academic programs and graduates. In their view, Kyrgyz universities must address domestic environmental challenges while also positioning themselves within the global labor market for sustainability specialists.

Further insight comes from China, where T. Hang and Y. Zhou (2024) analyze the effect of major selection on graduates' initial wages. Their quantitative study shows that salaries are higher when graduates choose specialized majors and when their first employment closely corresponds to their field of study. Interestingly, they find that family background factors such as hukou status and parental education exert little influence on either major choice or institutional selection. These findings challenge long-standing assumptions about rural–urban stratification and suggest that Chinese higher education may function as a pathway for social mobility and equity.

Finally, the rapid growth of microcredentials has become a defining feature of contemporary higher education reform. M. Salmon (2023) traces the drivers behind their global rise and considers their implications for universities. Defined as short, skills-focused programs that provide formal accreditation aligned with workplace needs, microcredentials have been embraced by governments and international actors as flexible responses to unstable labor markets. Salmon argues that the speed and scale of their adoption signal not just a policy trend but a structural rethinking of how universities approach lifelong learning and professional development.

Methodology

This study assesses how well higher education programs in Kazakhstan align with labor market requirements, focusing on the preparation of graduates with relevant skills and competencies. The underlying hypothesis is that alignment varies by region, discipline, and program type, with stronger correspondence in urban centers and programs with established industry partnerships.

The research combines quantitative and qualitative data. National statistics provide information on

higher education institutions, student enrollment, and graduate employment trends (2022–2024). Program evaluation data from the “Atameken” National Chamber of Entrepreneurs cover 2,051 bachelor programs, assessing curriculum relevance, practical orientation, and alignment with employer needs (Atameken, 2024). Labor market analytics from HeadHunter (2025) capture vacancy distribution, required experience, and skill demand. International literature indexed in Scopus and Web of Science provides comparative benchmarks.

Data were analyzed through sequential stages: literature review, compilation of statistical and program evaluation indicators, and comparison across regions, disciplines, and program types. Curriculum alignment was assessed via qualitative content analysis, focusing on hard and soft skills. Triangulation of multiple data sources ensured reliability, while visualization illustrated regional and sectoral disparities.

The novelty of this approach lies in integrating labor market analytics with program evaluations and national statistics, providing a comprehensive, evidence-based assessment of higher education responsiveness and graduate employability.

Results and discussion

Currently, the higher education system of the Republic of Kazakhstan is undergoing dynamic development, supported by both public and private higher education institutions. According to the Bureau of

National Statistics of the Republic of Kazakhstan, the number of higher education institutions in the country has demonstrated the following changes over the past seven years.

The reduction in the number of higher education institutions in Kazakhstan can be attributed to a set of reforms aimed at enhancing educational quality and optimizing the national higher education infrastructure. Key factors include the consolidation of universities to ensure more efficient allocation of resources, the strengthening of licensing requirements, and the broader policy emphasis on improving academic standards. These measures reflect the government’s effort to balance quantity with quality in higher education provision.

In the 2024–2025 academic year, a total of 113 higher education institutions were officially registered (Bureau of National Statistics, 2024). Of these, 56.6% were private, 42.5% were public, and 0.9% were foreign institutions. Student distribution across these institutions also illustrates an almost equal balance: 51.3% of students were enrolled in public universities, 48% in private universities, and 0.7% in foreign institutions. This structural composition highlights both the significant role of private institutions in the sector and the continued centrality of state universities in providing access to higher education. It also suggests a gradual diversification of the system, with foreign institutions playing a small but symbolically important role in internationalizing the higher education landscape.”

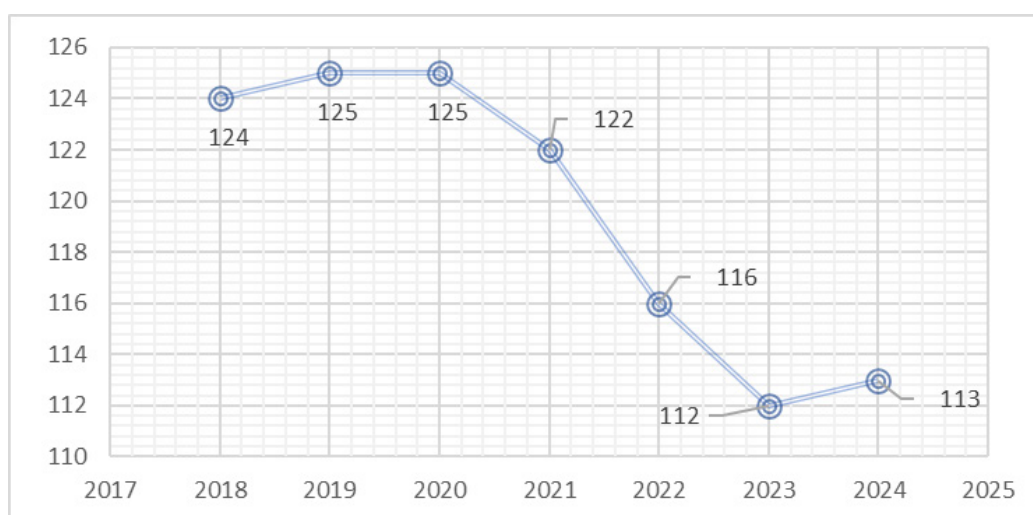


Figure 1 – Changes in the number of higher education institutions in the Republic of Kazakhstan between 2018 and 2024

Note - compiled by the author based on the source (Bureau of National Statistics, 2024)

In the era of digitalization and globalization, the creation of an effective innovation ecosystem is unthinkable without close cooperation between universities and industry. The ‘triple helix’ model developed by Henry Etzkowitz and Loet Leydesdorff (2023) (university–business–government) emphasizes the need for a balanced partnership across academic, industrial, and governmental spheres. Within this framework, universities act as generators of knowledge, providers of skilled professionals, and centers of research; businesses convert these intellectual resources into technologies, products, and economic value; while government institutions establish the regulatory and financial foundations that make sustained, innovation-driven development possible.

In 2024, the National Chamber of Entrepreneurs ‘Atameken’ evaluated 2,051 bachelor programs across 95 universities in Kazakhstan (Atameken,

2024). A central element of its methodology is the ‘total score based on expert evaluation,’ which reflects program quality as assessed by industry specialists and employers. This indicator goes beyond statistics, considering the relevance of curricula, practical orientation, internship opportunities, and graduate competencies. The resulting score highlights both the degree of university–employer collaboration and the employability of graduates, making it a key component of the ranking results.

Expert evaluations show that universities in Almaty and Astana achieve the highest scores, reflecting stronger infrastructure and competitiveness. Humanities and creative programs generally outperform technical and legal fields due to closer industry ties and greater practice orientation. However, score differences across sectors remain relatively small, indicating steady progress in aligning higher education with labor market needs.

Table 1 – Employers’ Evaluation Level of Kazakhstan University Graduates

Category	Entity / Program	Score
Average (all EPs & universities)	Overall average	0.404
Region – Highest	Almaty city	0.421
	Astana city	0.412
Region – Lowest	Ulytau region	0.387
University – Highest	T. Zhurgenov Kazakh National Academy of Arts	0.450
	Kazakh National Academy of Choreography	0.448
University – Lowest	D.A. Konaev Eurasian Law Academy	0.360
Educational Program – Highest	Pharmaceutical Production Technology	0.449
Educational Program – Lowest	Plant Production	0.320
Author’s compilation based on source (Atameken, 2024)		

The “Atameken” National Chamber of Entrepreneurs of the Republic of Kazakhstan and the Ministry of Labour and Social Protection of the Population of the Republic of Kazakhstan conduct an annual survey on workforce demand. In 2023, the survey covered 51.2 thousand business entities, of which 13 thousand entities reported a need for 134 thousand specialists. The requirements for these 134 thousand in-demand specialists are as follows in table 2:

Table 2 – Employers’ Requirements for Graduates by Level of Higher Education

Requirement	Percentage
Possess vocational–technical education	46.0 %
Higher education not required	27.0 %
Hold a higher education degree	21.6 %
Hold a certificate of completion of short-term professional training	5.4 %
Author’s compilation based on source (Atameken, 2024)	

A key indicator of university–industry collaboration is the alignment between curricula and labor market requirements. By comparing employer demands for hard and soft skills with the learning outcomes of degree programs, it becomes possible to assess how effectively universities prepare practice-oriented graduates. In Kazakhstan, this study employs data from the HeadHunter (hh.kz) platform, focusing on the most in-demand vacancies, to evaluate the extent to which higher education outputs correspond to current labor market needs.

As of 16 March 2025, the HeadHunter platform in the Republic of Kazakhstan listed 395 vacancies. The distribution of required work experience is as follows:

Indicators used in ranking educational programs play a key role in assessing the alignment of higher education with labor market needs. Metrics such as graduate employment rates, job-search duration, and median salaries measure labor market demand, while

employer involvement in curriculum design and internships ensures programs address real economic requirements. Together, these indicators reveal program effectiveness, strengthen the link between theory and practice, and contribute to improving the overall quality of education.

Below is the employment rate of graduates in Kazakhstan for the period 2022–2024 (National Statistics Bureau, 2024).

Table 3 – Work Experience Requirements for Job Vacancies on the HeadHunter Platform in Kazakhstan

Required Work Experience	Number of Vacancies
No experience	20
1–3 years	136
3–6 years	201
More than 6 years	38
Author’s compilation based on source (HeadHunter, 2024)	

Table 4 – Graduate Employment Outcomes

Year	Graduate Employment Rate (%)	Median Salary (KZT)	Average Job Search Duration (months)	Employer Satisfaction with Relevance of Educational Programs (%)
2022	79.5	167,577	3.2	67.5
2023	82.8	168,156	2.6	68
2024	80.0	168,887	3.3	–
Author’s compilation based on source (National Statistics Bureau, 2024)				

Analysis of graduate employment data reveals significant regional disparities. In 2024, employment rates reached 90% in Almaty Region but only 51% in Kyzylorda Region, reflecting differences in economic development, labor market structure, and infrastructural capacities. High-demand fields include informatics, robotics, technical physics, and medicine. Migration from rural to urban areas further affects the availability of skilled personnel in less developed regions.

Nationally, employment rates showed positive trends in 2022–2023, driven by economic growth, rising demand for qualified specialists, and alignment of educational programs with labor market needs. The slight decline in 2024 may reflect structural challenges, increased competition, and programmatic limitations.

Job search duration similarly reflects market dynamics: the reduction to 2.6 months in 2023 indicates effective coordination between universities and

employers, while the increase to 3.3 months in 2024 signals economic instability and skill–demand mismatches. These findings underscore the importance of enhancing educational quality and strengthening university–employer collaboration to align curricula with regional labor market requirements.

Conclusion

The findings of this study substantiate that the alignment of higher education systems with contemporary labor market requirements constitutes a multifaceted phenomenon shaped by economic structures, regional development disparities, institutional capacities, and socio-demographic factors. In the context of Kazakhstan, ongoing reforms—including consolidation of higher education institutions, enhancement of quality assurance mechanisms, and diversification of academic programs—have contributed to measurable improvements in graduate employability and

program relevance. Nevertheless, persistent regional asymmetries indicate that economic concentration, infrastructural differences, and local labor demand continue to influence the effectiveness of higher education in preparing work-ready graduates.

Empirical evidence highlights the critical importance of integrating practical-oriented curricula, industry collaboration, and competency-based education to ensure that graduates acquire both technical (hard) and transversal (soft) skills that correspond to current and emerging labor market needs, particularly in sectors such as information technology, robotics, technical physics, medicine, and sustainable development (Helms, 2021). The utilization of data-driven approaches, including labor market analytics and demand-focused platforms, enables universities to systematically calibrate their programs to the evolving requirements of employers.

From a policy and strategic perspective, the study underscores the necessity of sustaining institutional partnerships within the triple helix framework (university–industry–government) to facilitate the co-creation of knowledge, foster innovation, and ensure economic relevance. Continuous monitoring of labor market dynamics, targeted adaptation of educational

programs, and the introduction of flexible models such as microcredentials are essential to mitigate structural mismatches and enhance workforce readiness.

In conclusion, higher education institutions are central to cultivating a competitive and adaptive labor force; however, the effectiveness of these institutions in meeting labor market demands is contingent upon the systematic integration of evidence-based curricula, strengthened university–employer linkages, and proactive alignment with regional and sectoral economic priorities. Such an approach not only reinforces the practical applicability of academic programs but also contributes to the broader objectives of national economic development and sustainable human capital formation.

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