2024

NATIONAL REPORT

on the State and Development of the Higher Education System of the Republic of Kazakhstan

Ministry of Science and Higher Education of the Republic of Kazakhstan

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This report is intended to inform the public, academic and research institutions, government officials, and international experts about the state and achievements of Kazakhstan's higher education system in 2022–2023.

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BNS ASPR	Bureau of National Statistics of the Agency for Strategic Planning and Reforms
HCI	Human Capital Index
HDI	Human Development Index
MRP	Monthly Calculation Index
SRW	Social Work Place
GDP	Gross Domestic Product
ECI	Economic Complexity Index
PCI	Product Complexity Index
UN	United Nations
IMD	World Competitiveness Ranking
GII	Global Innovation Index
ICT	Information and Communication Technologies
QS	Quacquarelli Symonds
THE	Times Higher Education
NU	Nazarbayev University
OECD	Organisation for Economic Co-operation and Development
MOOC	Massive Open Online Course
MIT	Massachusetts Institute of Technology
AI	Artificial Intelligence
MSEHE	Ministry of Science and Higher Education
NQF	National Qualifications Framework
PTF	Program-targeted financing

SCES	State compulsory Education Standard
R&D	Research and Development
EP	Education Program
AMS	Average Monthly Salary
FTS	Faculty Teaching Staff
PIAAC	Programme for the International Assessment of Adult Competences
GDP	Gross domestic product
SDGs	Sustainable Development Goals
DER	Digital Educational Resources
DE	Distance Education
SEN	Special educational needs
HEI	Higher Education Institutions
JEP	Joint Educational Program
SDP	Shared Degree Programs
IPC	Institute for Professional Development
ENQA	European Association for Quality Assurance in Higher Education
UNESCO	United Nations Educational, Scientific and Cultural Organization
CBPAM	Center for the Bologna Process and Academic Mobility
NPJSC	Non-profit joint-stock companies
EPVO	Unified Higher Education Platform

List of Higher and Postgraduate Education Organizations

1. Academy of Public Administration under the President of the Republic of Kazakhstan
2. Nazarbayev University
3. L.N. Gumilyov Eurasian National University
4. Kazakh National University of Arts named after K. Baisseitova
5. Kazakh National Academy of horeography
6. Al-Farabi Kazakh National University
7. Abai Kazakh National Pedagogical University
8. Satbayev University
9. Kazakh National Women's Pedagogical University
10. Kazakh National Agrarian Research University
11. Asfendiyarov University
12. Kurmangazy Kazakh National Conservatory
13. Temirbek Zhurgenov Kazakh National Academy of Arts
14. Auezov University
15. Karaganda Buketov University
16. Seifullin University \ S.Seifullin Kazakh Agrotechnical Research University
17. Atyrau Oil and Gas University
18. Atyrau University
19. Zhangir Khan University
20. M. Utemisov West Kazakhstan University
21. Rudny Industrial Universityт
22. Akhmet Baitursynuly Kostanay Regional University
23. Altynsarin institute
24. Toraighyrov University
25. Margulan University
26. Kozybayev University
27. D. Serikbayev East Kazakhstan technical university
28. Amanzholov University
29. Shakarim University
30. Semey Medical University
31. Zhetysu University
32. Abylkas Saginov Karaganda Technical University
33. Karaganda Industrial University
34. Karaganda Medical University /
35. Zhubanov University
36. Zhanibekov University
37. Ualikhanov University
38. Dulaty University
39. KORKYT ATA University
40. Yessenov University
41. International University of Tourism and Hospitality
42. Astana Medical University
43. Academy of Civil Aviation
44. Nur-Mubarak University

45. Ahmet Yassawi University / Khaja Ahmed Yasawi International Kazakh-Turkish University
46. MAQSUT NARIKBAYEV UNIVERSITY / MNU
47. ESIL UNIVERSITY
48. Turan-Astana University
49. A.K. Kusainov Eurasian Institute for the Humanities
50. Astana IT University / AITU
51. Astana International University
52. K.KULAZHANOV KAZAKH UNIVERSITY OF TECHNOLOGY AND BUSINESS
53. Academy of Physical Culture and Mass Sports
54. International University of Information Technologies
55. KIMEP University
56. «Q» University
57. Kazakh-Russian Medical University / KPMУ
58. Turan University
59. International Education Corporation
60. ALT UNIVERSITY
61. NARXOZ University
62. Kazakh Academy of Sports and Tourism
63. Energo University
64. Almaty Technological University / ATU
65. Kazakhstan's Medical University "KSPH"
66. Almaty Management University / AlmaU
67. Eurasian Technological University
68. Kazakh Ablai Khan University of International Relations and World languages
69. Almaty University of Humanities and Economics
70. Kazakh Automobile and Road Institute
71. Caspian University
72. Kazakh-British Technical University / KBTU
73. De Montfort University Kazakhstan
74. International University of Engineering and Technology
75. Kunayev University
76. International Transport and Humanities University / ITHU
77. Kenzhegali Sagadiyev University of International Business / UIB
78. Kazakh-German University / DKU
79. West Kazakhstan Innovation and Technology University / West University
80. Kazakhstan University of Innovation and Telecommunication Systems
81. Kostanay University of Engineering and Economics named after M. Dulatov
82. Kostanay Social and Technical University named after Academician Z. Aldamzhar
83. Innovative Eurasian University
84. Ekibastuz Engineering and Technical Institute named after Academician K. Satpayev
85. Kazakh-American Free University
86. Alikhan Bokeikhan University
87. SDU University
88. Karaganda University of Kazpotrebsoyuz
89. Bolashaq Academy

1. Central Kazakhstan Academy
2. Zhezkazgan University
3. Marat Ospanov West Kazakhstan Medical University
4. Baishev University
5. Kazakh-Russian International University
6. South Kazakhstan Medical Academy
7. Miras University
8. Shymkent University
9. Central Asian Innovation University
10. Peoples' Friendship University named after Academician A. Kuatbekov
11. Tashenev University
12. Regional Innovation University
13. Academy of Humanities and Technology
14. Abay Myrzakhmetov Kokshetau University
15. Sherkhan Murtaza University
16. Kyzylorda University "Bolashak"
17. Kyzylorda Open University

Non-Governmental Organizations of Higher and Postgraduate Education

1. National Defense University of the Republic of Kazakhstan
2. Academy of Justice under the Supreme Court of the Republic of Kazakhstan
3. Academy of Civil Protection named after M. Gabdullin of the Ministry of Emergency Situations of the Republic of Kazakhstan
4. Kostanay Academy of the Ministry of Internal Affairs of the Republic of Kazakhstan named after Shrakbek Kabylbayev
5. Karaganda Academy of the Ministry of Internal Affairs of the Republic of Kazakhstan named after B. Beisenov
6. Aktobe Law Institute of the Ministry of Internal Affairs of the Republic of Kazakhstan named after Malkejar Bukenbayev
7. Academy of the National Guard of the Republic of Kazakhstan
8. Almaty Academy of the Ministry of Internal Affairs of the Republic of Kazakhstan named after Makan Yesbulatov
9. Military Institute of the Air Defense Forces named after twice Hero of the Soviet Union T.Y. Begeldinov
10. Military Engineering Institute of Radio Electronics and Communications
11. Military Institute of the Land Forces of the Ministry of Defense of the Republic of Kazakhstan named after S. Nurmagambetov
12. Academy of the National Security Committee of the Republic of Kazakhstan
13. Border Academy of the National Security Committee of the Republic of Kazakhstan
14. Academy of Law Enforcement Agencies under the Prosecutor General's Office of the Republic of Kazakhstan

Academy

an organization of higher and/or postgraduate education that carries out scientific and pedagogical activities in a specific field and serves as a scientific and methodological center;

Academic credit

a standardized unit for measuring the volume of scientific and/or academic work (workload) required for a student and/or teacher (educator) to achieve the learning outcomes of an educational program;

Academic mobility

the movement of students or faculty-researchers to study or conduct research for a specific academic period (semester or academic year) at another higher and/or postgraduate educational institution (domestically or abroad) with the mandatory transfer of completed academic programs and courses as academic credits at their home institution or for continuation of studies at another institution;

Accreditation body

a legal entity that conducts institutional and/or specialized (program) accreditation of educational organizations based on accreditation standards (regulations);

Accreditation standards (regulations)

documents issued by an accreditation body that establish requirements for the accreditation process;

Bachelor

a degree awarded to individuals who have completed higher education programs;

Undergraduate education (Bachelor's program)

higher education programs aimed at preparing specialists with the awarding of a "bachelor" degree in a specific field;

Professional doctorate

a degree awarded to individuals who have completed a doctoral program in a specific professional field and defended a dissertation in Kazakhstan or abroad, recognized in accordance with Kazakhstan's legislation;

International Bolashak Scholarship

a scholarship established by the President of Kazakhstan to fund Kazakhstani citizens for full-time study at leading foreign higher and/or postgraduate education institutions or for internships at foreign organizations for eligible professionals as determined by the Republican Commission for Training Personnel Abroad;

Professional development institute

an educational organization implementing relevant professional development programs within the continuous education system, supporting innovative processes in education to enhance methodological efficiency;

Qualification awarding

the procedure for confirming a set of individual abilities, professional knowledge, skills, and competencies necessary for performing work within a specific professional activity;

Education

a continuous process of instruction and training aimed at moral, intellectual, cultural, and physical development and the formation of professional competence;

Educational program

a unified set of core education characteristics, including goals, learning outcomes, content, organization of the educational process, methods of implementation, and assessment criteria;

Educational grant

a targeted sum of money provided to a student under the conditions established by Kazakhstan's legislation for covering the cost of higher or postgraduate education leading to a "bachelor" or "master" degree;

Methodological and scientific-methodological support of the education system and educational process

a set of activities, including the development of state educational standards, standard curricula, model syllabi, educational (including experimental) programs, regulatory, scientific, and methodological materials, their testing, implementation, monitoring, and research in the field of education;

Educational activity

a process of purposeful, pedagogically justified, and sequential interaction between education stakeholders, solving the tasks of teaching, development, and personality formation;

Education quality

a comprehensive characteristic of the effectiveness of educational activities, as well as the compliance of student training with the state compulsory education standard, individual needs, societal expectations, and governmental requirements;

National education quality assessment system

a set of institutional structures, procedures, forms, and methods for ensuring compliance with education quality standards;

Accreditation of educational institutions

a procedure by which an accreditation body recognizes the compliance of educational services with established accreditation standards (regulations) to provide objective information about their quality and confirm the existence of effective quality improvement mechanisms;

Recognition of educational documents

the official confirmation of educational documents issued by foreign educational organizations, including their branches, as well as research centers and laboratories;

Candidate of Sciences, Doctor of Sciences

academic degrees awarded based on dissertation defense;

Doctoral student

an individual studying in a doctoral program;

Doctoral studies (Doctorate)

postgraduate education programs aimed at preparing personnel for scientific, pedagogical, and/or professional activities, awarding the degree of Doctor of Philosophy (PhD) or professional doctorate;

Dual education

a form of training that combines education at an institution with mandatory periods of industrial training and professional practice at an enterprise (organization), ensuring employment opportunities and compensation for students, with shared responsibility among the enterprise, educational institution, and student;

Persons (children) with special educational needs

individuals (children) who require special conditions for obtaining education at an appropriate level due to permanent or temporary specific learning needs;

Per capita financing standard

the normative financial provision for state-guaranteed education costs at all levels of education;

Higher and/or postgraduate educational institution

a higher education institution implementing higher and/or postgraduate education programs and conducting research activities;

Endowment fund of a higher and/or postgraduate educational institution

a targeted capital fund formed through charitable donations, voluntary contributions, grants, and institutional investments, with income directed toward financing scientific, technological, innovative, and/or educational activities;

Research university

a university implementing a five-year development program approved by the Government of Kazakhstan and utilizing its activities to integrate education and science, generate and transfer new knowledge and technologies;

Inclusive education

a process ensuring equal access to education for all learners, considering their special educational needs and individual capabilities;

Institute

a higher and/or postgraduate educational organization engaged in scientific and pedagogical activities and preparing specialists for professional work;

Institutional accreditation

a procedure by which an accreditation body evaluates the effectiveness of an educational institution's internal quality assurance system based on its declared status and established accreditation standards (regulations);

Internship (medical education)

a form of training for students specializing in clinical disciplines as part of basic higher medical education to gain clinical practice admission;

Vocational education

a type of education aimed at equipping students with knowledge, skills, and competencies for professional activities in a specific field or occupation;

Professional training

a form of vocational education focused on developing new or modified professional skills necessary for specific job functions;

Credit-based learning system

an educational system allowing students to choose and independently plan their learning sequence by accumulating academic credits;

Distance learning

education conducted remotely through the interaction of educators and students using information and communication technologies and telecommunication tools;

Applied bachelor's degree

post-secondary education programs aimed at preparing specialists with the qualification of "applied bachelor";

Master's degree

a degree awarded to individuals who have completed master's level education programs;

Master's student

an individual enrolled in a master's program;

Master's program (Graduate education)

postgraduate education programs designed to prepare specialists with the award of a "master's" degree;

Specialized (programmatic) accreditation

a process for assessing the quality of specific educational programs offered by an educational institution;

Online learning

a form of education allowing students to obtain higher and/or postgraduate education through ICT and the Internet, facilitating interaction between educators and students regardless of geographic or time constraints;

Residency (medical education)

a level of postgraduate medical education aimed at acquiring or modifying a physician's professional qualifications for independent clinical practice;

Internal quality assurance system

a set of rules, standards (regulations), and quality assurance tools for the educational process and environment within educational organizations;

Scholarship programs

programs financing foreign students, including ethnic Kazakhs who are not citizens of Kazakhstan, for studying in Kazakhstani higher and/or postgraduate education institutions using state budget funds;

Student

an individual enrolled in an educational institution implementing technical, vocational, post-secondary, and higher education programs;

National higher and/or postgraduate educational institution

a higher and/or postgraduate educational institution with a special status;

Doctor of Philosophy (PhD)

a degree awarded to individuals who have completed a doctoral program in a scientific-pedagogical field and defended a dissertation in Kazakhstan or abroad, recognized according to Kazakhstan's legislation.

OPENING REMARKS

by the Minister of Science and Higher Education of the Republic of Kazakhstan

Dear Reader!

The year 2024 became an important milestone in the development of science and higher education in Kazakhstan. We are purposefully building an open and competitive educational ecosystem and following the path defined in **the Concept for the Development of Science and Higher Education for 2023–2029** — a path of systemic transformations focused on quality, international competitiveness, and integration into the global scientific and educational space. Our strategic benchmark is the creation of a **regional educational and research hub**, where the **Study in Kazakhstan brand** serves as an instrument of a long-term geo-academic strategy: through international partnerships, academic mobility, and joint programs, **we are strengthening the country's position in the global academic arena**. At the same time, a new "digital normality" is taking shape: updated educational programs with integrated artificial intelligence, as well as the use of big data and digital platforms for quality management, are increasing the effectiveness of universities' activities and ensuring transparency in their decision-making.

This National Report reflects the achievements, challenges, and promising directions of development defined by **the Concept for the Development of Science and Higher Education of the Republic of Kazakhstan for 2023–2029**, each of which is filled with concrete content and has measurable outcomes.

Accessibility of higher and postgraduate education is one of the key priorities of Kazakhstan's state policy, as confirmed by the provisions of the Concept for the Development of Higher Education and Science for 2023–2029. The document emphasizes that expanding access to higher education is impossible without ensuring financial and social conditions that allow every young

person to realize their right to education. This is precisely why, in recent years, a comprehensive set of systemic measures has been undertaken to ensure equal access to educational resources.

First and foremost, the number of state grants has been increased: more than 93 thousand grants have been allocated for the new academic year. This not only ensures growth in higher education coverage, but also makes it possible to take regional and sectoral needs into account, since grants are distributed with consideration of in-demand fields of study. A significant step was the increase in stipends—by 20% for bachelor's students and by 15% for master's and doctoral students—as well as the establishment of higher payments for students enrolled in pedagogical specialties. Such measures enhance the social attractiveness of higher education and create incentives for young people when choosing priority professions.

Of particular importance is the introduction of innovative tools to expand access to higher education, **such as the unified educational savings system "Keleshek" and differentiated grants**. These mechanisms make it possible to move beyond a purely budget-based logic of grant distribution and to create a more sustainable financial model of shared participation by families and the state in the educational process.

The "Keleshek" system is built on the principle of cumulative co-financing: the state provides start-up capital in the amount of 60 MCI, parents contribute from 1 to 3 MCI on a monthly basis, and banks guarantee a return of no less than 8% with an additional state premium of up to 7%. As a result, over 12 years a family accumulates significant educational capital—more than 5 million tenge—supplemented by funds from the National Fund ("National Fund for Children"). This ensures predictability and long-term planning of education-related expenses, reducing the risk of financial inaccessibility of education for households with different income levels.

Differentiated grants, in turn, represent a new step in the development of targeted support policy. Unlike traditional grants that cover the full cost of education, differentiated grants imply a sharing of expenses **between the state and the student**. At the same time, the co-financing share depends on the family's social situation, academic performance, and the demand for the specialty. This approach simultaneously addresses two objectives:

on the one hand, it expands coverage by increasing the number of students who can qualify for support, and on the other hand, it fosters greater personal engagement and responsibility among learners for obtaining a high-quality education.

Taken together, "Keleshek" and differentiated grants form a new paradigm of accessibility: education becomes not only free for a limited number of grant competition winners, but also financially affordable for a wide range of families. This creates a multi-level system of access to higher education, where direct budget financing is combined with savings instruments and co-financing mechanisms, in line with the state's strategic objective to increase higher education coverage and ensure social equity.

A key priority of state policy in higher education is the **proactive provision of human capital for the economy**, aimed at ensuring that the specialist training system not only responds to current labor market challenges, but also develops "forward-looking" competencies, laying the foundation for sustainable development across various sectors. In the Concept for the Development of Higher Education, this direction is interpreted as the need to ensure a systemic linkage between educational programs, professional standards, and forecasting tools, which should make it possible to anticipate labor market transformations and the emergence of technological shifts.

In practice, this guideline is reflected in the fact that educational programs in Kazakhstan are acquiring **a dynamic and system-oriented character**, ensuring alignment with professional standards. **Eighty-five percent of the 8.5 thousand programs currently being implemented have already been developed on the basis of professional standards**, demonstrating a high level of alignment between educational content and the requirements of the real sector of the economy. It is important to note that **17.65% of innovative programs** were formed specifically on the basis of updated standards, confirming the systemic nature of innovation implementation in workforce training and an orientation toward the further development of technologies and production processes.

A special role in this work belongs to the project **"Mamandygym-Bolashagym"**, within the framework of which **regional and sectoral atlases of new professions and competencies** have been developed and implemented. These tools function as a "map of the future labor

market" and enable universities and colleges to design educational programs based on forecasts of changes in employment structures. Regional atlases reflect local economic characteristics, investment projects, and priority sectors, making it possible to apply them in specific territorial contexts.

By 2024, such atlases had been developed in **9 regions of the country** (Pavlodar, Mangystau, Karaganda, Akmola, Aktobe, Zhambyl, and Zhetysu regions, as well as the cities of Astana and Almaty). On their basis, universities updated more than **900 educational programs**, of which about **500 new programs were introduced in 90 universities nationwide**.

Thus, a model of workforce training is being formed in which universities do not merely "catch up" with the market, but become active participants in its proactive development. The use of profession atlases and professional standards (competencies) in the design of educational programs makes it possible to build a long-term system of human capital provision, taking into account national priorities, regional specificities, and global trends.

In the modern context of rapid economic and technological transformation, state policy in higher education places emphasis on the **development of a lifelong learning system** and the formation of mechanisms for **recognizing the outcomes of non-formal and informal learning**. In the Concept for the Development of Higher Education, this direction is designated as a strategic tool that makes it possible not only to maintain workforce competitiveness, but also to form flexible professional growth trajectories throughout an individual's life.

This refers to a transition from the traditional linear model "school – university – work" to the concept of **lifelong learning**, under which education becomes a continuous and systematic process. This implies the possibility of returning to education at any age, improving competencies as labor market requirements change, and mastering new professions in the context of digitalization and technological change.

To implement this approach, a set of measures is envisaged:

● **introduction of micro-qualifications and short-term educational programs** that make it possible to master individual modules and competencies demanded by employers;

● **recognition of the results of non-formal learning,** including those obtained through online courses, internships, corporate training, and practical work experience;

● development of **a national skills certification system**, which creates opportunities for formal confirmation of competencies acquired outside the classical educational process.

This direction is of particular importance in conditions where the labor market requires specialists not only to have one profession for life, but also the ability to repeatedly change professional trajectories. In this sense, mechanisms for recognizing non-formal learning serve as a connecting link between the education system and the demands of the real economy, reducing the gap between academic programs and practical skills.

The labor market requires not only continuous updating of professional trajectories, but also **qualitative expansion of digital competencies**, without which successful participation in the global knowledge economy is impossible. Following this logic, improving digital literacy and mastering artificial intelligence technologies are becoming integral components of the state's overall education policy.

Of particular significance here is the **AI-Sana** program, the phased implementation of which was announced by the Head of State on December 11, 2024. Its scale is unprecedented: the program covers 650 thousand students nationwide, providing each of them with access to additional competencies in artificial intelligence and AI entrepreneurship. The goal is not only to teach students to use new technologies, but also to form a foundation for startup initiatives and the practical implementation of AI across various sectors of the economy, accelerating their technological development.

The preparatory stage of the program began in February 2025. To date, nearly 390 thousand certificates have been issued, demonstrating its high momentum. International partners have made a significant contribution to implementation: **Huawei** localized AI courses completed by 175 thousand students, who received more than 250 thousand certificates; the **Coursera** educational platform provided nearly 37 thousand licenses to 95 universities, whose students received 59 thousand certificates upon completion of training, and Kazakhstan became a finalist for an

international Coursera award. In cooperation with Astana Hub, the course "Fundamentals of AI: ChatGPT" was organized, after which more than 119 thousand students were certified.

Universities actively joined this initiative, issuing an additional 35 thousand certificates through their own training programs. Moreover, amendments were made to the State Mandatory Education Standard, according to which AI courses became mandatory. Today, 93 universities have adapted their programs, and 20 universities have launched 25 new artificial intelligence programs.

To ensure high-quality implementation of the AI-Sana program, leading international experts have been engaged: instructors from the Kazakhstan branches of **SeoulTech** and **CityU**, as well as Professor Paul Kim—the founder of AI Entrepreneur at Stanford and Director of the Center for Future Education in China. On this basis, the first practical results have already been achieved: students have developed and are testing 119 AI agents, with another 395 currently under development.

Technical infrastructure has also received powerful development: an academic supercomputer cluster with a total capacity of 2 PFlops is being created, and negotiations are underway to obtain a new cluster from China. In universities across the country, with the participation of foreign partners, AI schools and centers are being opened, new educational programs are being launched, and dual diplomas are being awarded. More than 3,000 faculty members have already been certified in AI programs, including over 1,000 through Coursera courses.

Thus, the **AI-Sana** program is becoming a key driver in shaping the digital skills of a new generation of specialists. It not only ensures large-scale training in artificial intelligence, but also forms **the human capital base for the International Artificial Intelligence Center Alem.AI**, positioning Kazakhstan among the leaders in the adoption of AI technologies in educational and professional spaces.

All of the initiatives outlined above form a unified strategy aimed at creating an advanced, competitive, and inclusive system of higher education and science in Kazakhstan. The implementation of these measures will strengthen the country's scientific potential,

build a talent pool for high-tech industries, and ensure free access to knowledge and digital opportunities for every citizen.

This analytical report is an open document for discussion and joint problem-solving. The system of higher education and science in Kazakhstan is developing continuously, and we would be grateful for your proposals, feedback, and active participation in the development of the national educational ecosystem.

We believe that the combined efforts of the state, society, and business will place Kazakhstan on a trajectory toward a true knowledge economy and secure a достойное place among global leaders. May this report serve as a source of inspiration and growth, as well as a stimulus for further productive work for the benefit of the country's future.

We wish you a productive reading of the report and success in achieving our shared goals!

Sincerely,
Minister of Science and Higher Education
of the Republic of Kazakhstan
Sayasat Nurbek

Chapter 1.

Higher Education in Kazakhstan: Between National Priorities and Global Trends

1.1. State Policy in the Field of Higher Education

In addressing global challenges–from combating poverty and safeguarding health to protecting the environment and strengthening human rights–education is destined to play a decisive role.

It is no coincidence that UNESCO documents emphasize: none of the strategies for improving human development can be implemented without a clear and effective educational policy.

Against this backdrop, the system of higher education is undergoing profound transformations today, reflecting global socio-economic and technological shifts.

These changes are driven by the growing recognition that education is not only a means of transmitting knowledge but also a powerful tool for shaping new generations capable of critical thinking, responsible action, and ensuring a sustainable future. A person who is able to seek new knowledge, apply it creatively, and make unconventional decisions has become the key capital of the 21st century. In this regard, higher education is increasingly recognized as a crucial factor of economic and social progress. The social role of education is steadily growing. The prospects for sustainable development, the level of well-being, and the degree of cultural maturity of society largely depend on its quality and orientation [1–3].

According to UNESCO, around 264 million students are currently enrolled in universities worldwide–more than double the number twenty years ago–and this figure continues to grow. There has been an expansion of access, an increase in student mobility, a diversification of educational programs, dynamic research activity, and the active integration of technology.

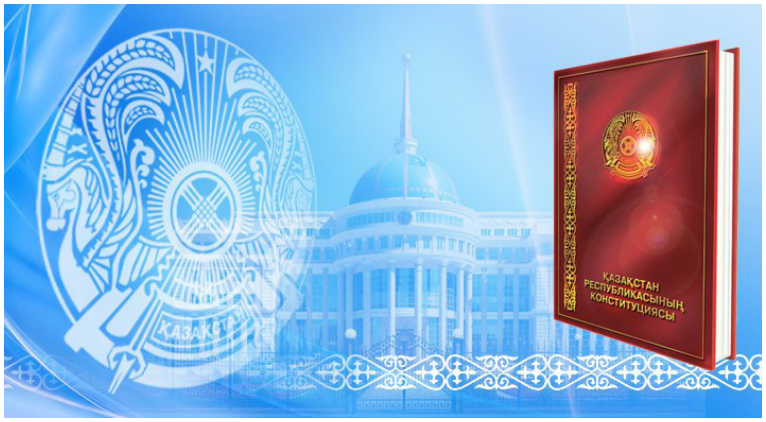
However, despite rising demand, the overall enrollment rate remains at **43%**, with significant disparities across countries and regions.

More than **9 million** students pursue their studies abroad, highlighting the growth of international academic mobility.

At the same time, among the more than **123 million refugees worldwide**, only **7% of young people** have access to higher education, while the figures for primary and secondary education stand at **68%** and **34%**, respectively **[3].**

These data reflect the considerable potential of higher education for both personal development and the progress of society as a whole, while also pointing to persistent global challenges–the need to expand access to education, reduce educational inequality, and ensure high quality amid massification and internationalization.

In accordance with the Constitution of the Republic of Kazakhstan, the state guarantees every citizen the right to education, including the opportunity to obtain free higher education on a competitive basis at public institutions. This provision enshrines education as one of the fundamental social rights of individuals and obliges the state to create conditions for its realization. By adhering to the constitutional principles of equality and accessibility, the state creates the necessary conditions for every citizen to exercise this right, ensuring the continuity and quality of the educational process [4].



The Law "**On Education**" specifies the content of this constitutional right, defining education as a continuous process of upbringing and learning aimed at the comprehensive development of the individual–moral, intellectual, cultural, and physical–as well as the formation of professional competence [5].

Thus, state policy in the field of education is built upon the understanding of education as a key institution for shaping human capital, ensuring sustainable societal development, and strengthening statehood.

At the core of this policy lies a holistic and strategically balanced approach that addresses both economic objectives–such as the training of competitive specialists and integration with science and industry–and socio-cultural ones, including the formation of civic identity, the development of creative and moral potential, and engagement with national traditions and global culture. This interpretation emphasizes that education is not only utilitarian in preparing a workforce for the economy but also performs broader

social and cultural functions. It shapes the value orientations of the individual, fosters civic responsibility, contributes to the preservation and enrichment of national culture, and integrates the individual into society on the basis of both national and universal values.

The state's policy takes into account not only the strategic goals of education but also the institutional conditions required to achieve them, recognizing that without a solid organizational and legal foundation these goals cannot be realized. Such conditions include the support and development of the system's human resources, the expansion of autonomy for educational organizations– including democratization and greater transparency in governance–as well as ensuring diversity in ownership, fields of study, and formats of learning. The creation of such conditions guarantees the sustainability, flexibility, and adaptability of the education system to the evolving needs of society, the economy, and learners themselves, while maintaining a balance between individual and national priorities and global trends [5].

The Concept for the Development of Education of the Republic of Kazakhstan for 2023–2029 complements the legal framework by defining higher education not only as a tool of professional training but also as an environment for shaping the values of citizenship, innovation, and academic culture. A central element of modern educational policy is the shift toward qualitative transformations, including the strengthening of academic freedom, diversification of university governance models, and the expansion of access to higher education through targeted financing mechanisms and grant policies. These measures are aimed at addressing systemic challenges–among them, the limited scientific productivity of universities and the need for integration into the global educational space.

Moreover, in the context of the new geostrategic reality, the Republic of Kazakhstan is consistently pursuing the ambitious goal of transforming into a regional educational hub capable of accumulating and disseminating advanced knowledge, technologies, and innovations across the Eurasian space. This development trajectory is enshrined both in the Concept for the Development of Education for 2023–2029 and in a series of intergovernmental agreements that envisage the deepening of academic mobility, the creation of joint educational programs, and the institutionalization of cross-border knowledge exchange. The expansion of branch campuses of leading foreign universities in Kazakhstan serves not merely as a tool of internationalization, but as an element of a purposeful policy aimed at embedding the country into global value chains of academic production.

Branch campuses of universities from the United Kingdom, Germany, South Korea, Turkey, and other countries are becoming entry points for international educational standards adapted to the Kazakhstani context. This strengthens institutional competition, stimulates the development of teaching and research capacity, and contributes to the formation of a multi-level system of training geared both toward the domestic market and transnational demand. Under these conditions, educational institutions in Kazakhstan act not only as consumers but also as producers of academic knowledge and innovative content, which in turn requires stronger technology transfer, localization of global best practices, and institutional flexibility of universities. The formation of a regional hub is not an end in itself–it is aimed at ensuring the country's intellectual sovereignty and affirming its role as an exporter of educational services, a bearer of academic standards, and a driver of human capital development in Central Asia.

In 2024, the state policy of the Republic of Kazakhstan in the field of higher education and science reached a qualitatively new level, reflected in the adoption of a series of legislative and regulatory acts aimed at building a modern research and educational ecosystem. The foundation of these changes was the new Law "On Science and Technological Policy," which for the first time unified within a single concept the goals and objectives of science, technology, and innovation, and enshrined the principles of their integration with higher education and the economy [6].

An important direction has been the renewal of development programs for research universities, whose strategic objectives and performance indicators were aligned with the priorities of science and technology policy (Resolution of the Government of the Republic of Kazakhstan of September 2, 2024, No. 713). By Order of the Ministry of Science and Higher Education of the Republic of Kazakhstan of October 3, 2024, No. 474 (registered No. 35208), the Rules and Criteria for Granting Research University Status were approved, setting clear requirements for the share of researchers, publication activity, and grant support.

The reform also affected the National Academy of Sciences: the Rules for the Election of Academicians (Order of the Ministry of Science and Higher Education of September 23, 2024, No. 457) tightened the requirements for candidates, orienting them toward significant international results, while the Resolution of the Government of the Republic of Kazakhstan of September 27, 2024, No. 803 revised the procedure for awarding lifelong stipends to academicians–raising their amount, simplifying the appointment procedure, and establishing unified and transparent rules.

Significant changes were also made to the regulatory framework for scientific activity. Outdated orders from 2011–2023 were abolished, and new, modern documents were adopted to simplify procedures and increase transparency.

The Rules for State Registration of Dissertations (Order of the Ministry of Science and Higher Education of October 1, 2024, No. 472) сократили сроки регистрации transferred the process to an electronic format, reduced registration times, and ensured the creation of a unified digital database of dissertations, which not only facilitates access to research results but also promotes knowledge dissemination and helps combat duplication and plagiarism.

The Model Regulation on Shared-Use Laboratories (Order of the Ministry of Science and Higher Education of September 18, 2024, No. 452) established modern standards for the management of scientific infrastructure, ensuring access to equipment for external users and stimulating inter-organizational cooperation.

Model Rules of Scientific Ethics, the Regulation on the Scientific and Technical Council, and the Rules for Organizing R&D with

Public-Private Partnerships were also adopted, contributing to the formation of a culture of open and responsible science and the involvement of private investment in research.

All these measures not only simplified procedures and increased transparency but also created institutional and technological preconditions for more open, productive, and competitive science: a unified dissertation database was established, scientific knowledge dissemination was ensured, infrastructure quality control was strengthened, and ethical and organizational standards of researchers' work were updated. Thus, the 2024 reform package strengthened the integration of science and education, expanded access to research results and infrastructure, and ensured more efficient use of resources, reflecting the state's strategic priority of building a knowledge-based economy and fostering sustainable development.

All these measures are being implemented within the university ecosystem, which is becoming a key platform for the integration of science, education, and innovation. In continuation of this policy, within the framework of the Concept for the Development of Higher and Postgraduate Education for 2023–2029, systemic measures are being taken to concentrate resources, modernize governance, and diversify university funding sources. The creation of Centers of Academic Excellence based on leading national and regional universities makes it possible to pool the best scientific, human, and infrastructural resources to achieve international standards of quality in education and science, as well as to establish university specialization in priority areas of the economy. In parallel, the practice of establishing endowment funds is being developed as a mechanism for sustainable and long-term financing, contributing to strengthening the financial independence of universities and involving alumni and businesses in supporting their development. These measures are aimed at shaping a sustainable university ecosystem capable of adapting to the challenges of global competition, ensuring the training of in-demand specialists, and contributing to the innovative development of the country [7].

List of regulatory acts updated in 2024

1. Law of the Republic of Kazakhstan of May 6, 2024, No. 282-VII "On Amendments and Additions to Certain Legislative Acts on Science and Education."

2. Resolution of the Government of the Republic of Kazakhstan of September 2, 2024, No. 713 "On Amendments to the Development Programs of Research Universities."

3. Order of the Ministry of Science and Higher Education of the Republic of Kazakhstan of October 3, 2024, No. 474 (registered on October 4, 2024, No. 35208) "On Approval of the Rules and Criteria for Granting Organizations of Higher and/or Postgraduate Education the Status of 'Research University.'"

4. Order of the Ministry of Science and Higher Education of the Republic of Kazakhstan of September 23, 2024, No. 457 (registered on September 25, 2024, No. 35119) "On Approval of the Rules for the Election of Academicians of the National Academy of Sciences of the Republic of Kazakhstan."

5. Resolution of the Government of the Republic of Kazakhstan of September 27, 2024, No. 803 "On Approval of the Procedure for Payment of Lifetime Stipends to Academicians of the NAS."

6. Order of the Ministry of Science and

Higher Education of the Republic of Kazakhstan of October 1, 2024, No. 472 (registered on October 1, 2024, No. 35193) "On Approval of the Rules for State Registration of Dissertations."

7. Order of the Ministry of Science and Higher Education of the Republic of Kazakhstan of September 18, 2024, No. 452 (registered on September 19, 2024, No. 35080) "On Approval of the Model Regulation on Shared-Use Scientific Laboratories."
8. Order of the Ministry of Science and Higher Education of the Republic of Kazakhstan of September 30, 2024, No. 466 "On Approval of the Classifier of Scientific Fields."

Amid growing public demand for accessibility and fairness in higher education, the state is consistently expanding educational opportunities for young people. Over the past two years alone, the volume of state educational grants has increased from 171,700 students in 2023 to 206,803 in 2024. In addition to these measures, an important innovation in state policy in 2024 was the development and launch of the Unified Voluntary Savings Program Keleshek.

The program is aimed at improving access to higher education and creating incentives for long-term investment in children's education. It represents a comprehensive support measure that consolidates parental savings, insurance payouts, government subsidies, and revenues from the National Fund into a unified system, ensuring that by the time a child reaches adulthood, the necessary funds for university tuition are available.

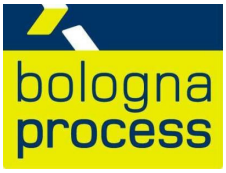
A key feature of the program lies in its multi-source funding model: voluntary insurance contributions from parents under an educational savings insurance contract; investment income generated by the insurance company; an annual state bonus of 5–7% of the accumulated sum; and a Start-Up Educational Capital provided by the state – a one-time payment of 60 Monthly Calculation Indices (for socially vulnerable families, 120 MCI), granted to a child upon reaching the age of five (provided that an insurance contract is in place). Furthermore, the **Keleshek** program is synchronized with the **National Fund for Children initiative**, under which every minor citizen annually receives 50% of the National Fund's investment income. This enables children, upon reaching the age of 18, to consolidate resources from both sources to cover the costs of higher education.

Among the additional advantages of the system is the availability of insurance protection in the event of disability or death of a parent. In such cases, the child will still receive the accumulated amount in full upon reaching the age of 18, even if the parent is no longer able to continue contributions. The program also provides tax benefits: parents may reduce their tax burden by 10% of the contributions made (up to 320 MCIs per year), provided the contract is concluded for a period of at least three years. Taken together, these mechanisms can yield returns of up to **23%** annually, including guaranteed income from the insurance company, state bonuses, and tax incentives [8].

Thus, the Keleshek program not only stimulates long-term savings for children's education but also creates a unified space for interaction between families, the state, and financial institutions in the interests of human capital development. As a result, institutional conditions are established to increase access to higher education, reduce barriers for socially vulnerable groups, and foster a culture of responsible educational planning from an early age.

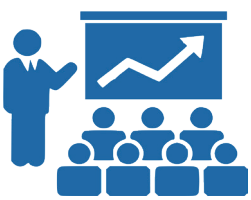
Accordingly, state policy in education is based on the logic of a holistic and interconnected approach, in which education is understood not as a collection of disparate tasks but as a single, consistent process of shaping individuals, society, and the country's sustainable future. Its key elements not only complement but also reinforce one another, creating a solid foundation for the long-term and sustainable development of the state and society. This approach enables the state to simultaneously meet the pragmatic needs of the present while ensuring the realization of its strategic interests for the future, maintaining a balance between economic, social, and cultural development goals.

Thus, modern higher education policy in the Republic of Kazakhstan represents a strategically balanced and comprehensive response to both domestic and global challenges. The measures being implemented cover the key areas of university ecosystem development: expanding access to education and reducing inequality, improving the quality of academic programs and their alignment with the needs of the economy, stimulating research and innovation, and strengthening international cooperation and academic mobility. These steps are aimed at building a sustainable, adaptive, and competitive higher education system capable not only of reproducing knowledge and generating innovation but also of fostering responsible citizenship and preparing specialists demanded in the context of accelerating technological change and the global transformation of the labor market.



It is important to note that Kazakhstan's higher education system is developing on the basis of the principles and values of the **Bologna Process**, which has become the most extensive and profound reform of higher education in the country's history. By joining the Bologna Process, Kazakhstan integrated into its system clear and transparent approaches to the design of study programs and academic degrees that are internationally comparable. This has opened new opportunities for improving education quality, enhancing student and faculty mobility, fostering academic exchange, and ensuring mutual recognition of qualifications.

The introduction of the three-tier degree system (bachelor's–master's–doctoral), the academic credit system (ECTS-type), and diploma supplements has increased the flexibility of educational pathways, making them more understandable and attractive for employers and international partners. These reforms have enhanced the competitiveness of Kazakhstani universities, broadened access for Kazakhstani students and researchers to global educational and research spaces, and strengthened international trust in national qualifications.



Another key element in the development of higher education in Kazakhstan, stemming from its commitment to the Bologna principles, has been the introduction of the **National Qualifications System** (NQS). The National Qualifications System serves as a strategic instrument

for the modernization of human capital, aimed at establishing clear and comparable benchmarks for professional training, assessment, and recognition of qualifications. At the core of this system lies the **National Qualifications Framework** (NQF), which provides a structured description of qualification levels recognized in the national economy and education system. It ensures the integration of educational standards, professional requirements, and independent assessment procedures, acting as a kind of "translator" between the language of education and the needs of the labor market.

International experience shows that countries that have successfully implemented National Qualifications Frameworks (NQFs)–in particular, the European Union through the European Qualifications Framework (EQF), Australia through the Australian Qualifications Framework (AQF), as well as South Korea and Singapore–demonstrate a higher level of coherence between workforce training systems and the goals of socio-economic development. A common element of these systems is their focus on learning outcomes, i.e., what an individual actually knows, is able to do, and is competent in–regardless of whether these competencies were acquired through formal, non-formal, or informal learning. This makes qualifications frameworks particularly relevant in the context of technological transformation, digitalization, and the need for continuous skills renewal [9].

South Korea developed and implemented the **National Competency Standards** (NCS) as a systemic foundation for assessing and recognizing professional qualifications, closely linked to its NQF. The model is employer-oriented and covers more than 800 professions. A distinctive feature of the Korean approach is the active involvement of sectoral committees and the direct integration of NCS into college and university curricula, which has significantly improved graduate employability and reduced structural skill mismatches in the labor market [10].

Singapore employs the Singapore **Workforce Skills Qualifications** (WSQ) system–a national framework based on the NQF and the competency-based approach. The WSQ focuses on the development of key and transferable skills (soft and cross-cutting skills), which are particularly important in the digital economy. The system targets not only young people but also adults, including older workers, allowing for the accumulation of credits, recognition of prior learning, and continuous education through modular programs. As a result, Singapore has become one of the global leaders in workforce employability and adaptability [11].

The Australian Qualifications Framework (AQF) is a national policy that defines the standards of educational qualifications and encompasses all levels of education–from school to **vocational education and training** (VET) and higher education. It represents a comprehensive, integrated, and hierarchically structured system of ten levels, with clearly defined learning outcomes for each: from basic knowledge and skills at Level 1 (Certificate I) to academic and research excellence at Level 10 (Doctoral Degree). The AQF is outcomes-based and emphasizes that qualifications are holistic constructs composed of modules of competency (units of competency), which themselves are not directly tied to AQF levels.

An important feature of the AQF is its well-developed regulatory base and governance mechanisms: standards and requirements for accreditation, awarding of qualifications, and recognition of learning pathways (including Recognition of Prior Learning, RPL), the maintenance of qualification and provider registers, as well as procedures for updating the framework itself.

Particular attention is given to ensuring connections between qualifications and transitions across sectors, which contributes to building a flexible and competitive workforce and expanding access to higher qualifications. At the same time, the AQF ensures compliance with national standards and international comparability, thereby strengthening the trust and recognition of Australian qualifications abroad [12]

The Kazakhstani National Qualifications Framework (NQF) is structured in accordance with the eight-level model of the European Qualifications Framework (EQF) and aligned with the levels of education established in the Law of the Republic of Kazakhstan "On Education." Its levels are ranked by the degree of complexity, autonomy, and responsibility of professional activity–ranging from basic operational functions to strategic management at the state level. Each level is detailed along three dimensions: occupational functions, skills, and knowledge, which allows the NQF to serve as a foundation for the development of sectoral qualifications frameworks, professional standards, and educational programs. In addition, it enables the construction of clear career progression pathways and ensures the recognition of

Figure 1.1.1.
National Qualifications Framework of Kazakhstan

8 Level	→	Doctoral studies (PhD), doctoral degree PhD	Researcher
7 Level	→	Master's degree, residency	Manager
6 Level	→	Higher education	Specialist / Engineer
5 Level	→	Post-secondary education, applied bachelor's degree	Junior Specialist / Engineer
4 Level	→	TVET (Technical and Vocational Education and Training)	Technician
3 Level	→	General secondary education and vocational training (enterprise-based training)	Skilled Worker
2 Level	→	Short-term courses in educational organizations or enterprise-based training	
1 Level	→	Short-term workplace training	

qualifications both across sectors and at the international level. (Figure 1.1.1.)

Thus, the NQF performs a dual function: on the one hand, it standardizes qualification expectations; on the other, it creates a flexible infrastructure for the development of human potential. Its significance is reinforced in the context of the transition to a competence-based model of education, the digital transformation of the economy, and the need for the valorization of non-formal learning. For the sustainable development of the qualifications system, the institutional stability of the NQF is critically important, along with the participation of all stakeholders–government, employers, educational institutions, and workers themselves–as well as the timely updating of the framework in response to changes in labor structures and global competencies. (Table 1.1.1.)

Table 1.1.1.
National Qualifications Frameworks: Comparative Table by Country

Country / System	Number of qualification levels	Learning Outcomes Orientation	Recognition of Non-Formal / Informal Learning	Link with the Education System	Employer Involvement	Target audience	Examples of use
Европейский союз (EQF)	8	Yes	Yes	Strong	Mode-rate	All ratings	Qualification comparison in the EU, mobility
Австралия (AQF)	10	Yes	Yes	Strong	High	All ratings	Curriculum development, migration policy
Южная Корея (NCS)	8	Yes	Yes	Integra-ted into the program	High	Students, adults	College program alignment, independent certification
Сингапур (WSQ)	7	Yes	Yes	Integrated through modularity	High	Adults, elderly	Upskilling, credit accumulation
Казахстан (НРК)	8	Yes	Partially	Depends on the industry	Limited	Mostly young people	Professional standards, Sectoral Qualifications Framework, development of state educational standards

Table 1.1.2.
Description of the Nature of Knowledge by Levels of the National Qualifications Framework

NQF Level	Nature of Knowledge	Nature of Skills (Abilities)
1	Elementary basic knowledge about the surrounding world. Understanding simple connections between phenomena.	Performing elementary tasks according to a known pattern.
2	Basic foundational knowledge, professional orientation.	Performing tasks according to a given algorithm of actions and adjusting it in accordance with working conditions.
3	Basic general education and practice-oriented knowledge in a professional field.	Solving typical professional tasks in standard conditions.
4	Professional (theoretical and practical) knowledge and experience.	Solving typical professional tasks of a wide range in predictable conditions, requiring independent analysis of educational and work situations, and assessment of possible changes and consequences.
5	A broad range of theoretical and practical knowledge in a professional field.	Independent development and advancement of various options for solving professional tasks using theoretical and practical knowledge.
6	A broad range of theoretical and practical knowledge in a professional field.	Independent development and advancement of various options for solving professional tasks, including unpredictable ones, using theoretical and practical knowledge.
7	Conceptual knowledge in science and professional activity. Creation of new applied knowledge in a professional field.	Ability to generate new ideas in professional and research activities and select appropriate methods and tools for their implementation; conducting innovative research to obtain new knowledge.
8	Methodological knowledge in the field of innovative professional activity.	Generating ideas, producing results of innovative activities of large scale, managing socio-economic, production, and scientific processes at a complex and professional level.

Source:
National and Sectoral Qualifications Frameworks

The National Qualifications Framework (NQF) is a key element of the national qualifications system (NQS), which establishes a unified scale of qualification levels and defines the general characteristics of professional activity at each level. A distinctive feature of the NQF is that it integrates the requirements of the labor market and the education system, ensuring their coherence.

The NQF is outcomes-based and describes levels through such descriptors as knowledge, skills, and competences. For example, at Level 1 the NQF requires the performance of elementary tasks by example and possession of basic knowledge about the surrounding world, whereas at Level 8 it requires methodological knowledge, the generation of innovative ideas, and leadership of complex processes. Thus, the NQF ensures both vertical and horizontal comparability of qualifications and enables the development of clear and transparent educational and professional pathways. (Table 1.1.2.)

serve as a tool for elaborating the National Qualifications Framework (NQF) with regard to the specific features of particular branches of the economy. While the NQF sets out the overall architecture of qualifications, SQFs "translate" it into sectoral terms, producing a structured description of qualification levels recognised by the professional community of the relevant field. In each SQF, qualification levels are described on the basis of the NQF descriptors while also taking into account the sector's outlook, technological characteristics, occupational specifics, and strategic development priorities.

The development of SQFs is likewise built on the principles of continuity, clarity and sectoral applicability, involving functional analysis and broad engagement of professional communities and employers. Each SQF is prepared by a working group that conducts a sector analysis and drafts professional qualification maps with reference to national (NKZ, OKED) and international classifiers (ISCO-08). Since 2016, **41 SQFs** have been developed in Kazakhstan and published on the website of the National Chamber of Entrepreneurs "Atameken":

https://atameken.kz/ru/services/16-professionalnyye-standarty-i-tsentry-sertifikatsii-nsk.

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Thus, the NQF and SQFs form a two-tier system: the NQF provides universal qualification standards and the methodological foundation, while SQFs adapt these standards to the specifics of individual sectors, ensuring their practical relevance. This approach makes it possible to maintain the integrity of the national qualifications system while accommodating the diverse needs of different sectors of the economy. It helps improve the quality of workforce training and its alignment with contemporary labour-market requirements, and strengthens the link between education and professional activity [13].

1.2. Higher Education of Kazakhstan in the Global World (GII, ИЧР, QS, THE)

The system of higher education plays a significant role in shaping human capital, developing scientific potential, fostering innovation, and strengthening socio-economic development. In the context of growing international competition and the active exchange of knowledge among countries, international comparative indices and academic rankings are gaining particular relevance. They serve as tools for assessing the level of development of national education systems and determining the extent of their integration into global educational and scientific processes.

For Kazakhstan, participation in international measurements such as the Global Innovation Index (GII), the Human Development Index (HDI), as well as the QS World University Rankings and Times Higher Education (THE) rankings, serves as an important tool for the external evaluation of the effectiveness of educational policy and scientific activity. These indicators reflect not only the current state of higher education, but also its potential to achieve strategic goals – from improving the quality of specialist training to fostering a research environment and enhancing academic mobility.

An analysis of Kazakhstan's positions in the mentioned indices and rankings makes it possible to objectively assess the dynamics of higher education development, identify the strengths and vulnerabilities of the system, and outline directions for further transformation. The data presented in this section for 2024 reflect Kazakhstan's integration into the global educational and scientific space and may serve as a basis for managerial decision-making in the field of higher education.

In 2024, Kazakhstan ranked **78th out of 133 countries in the Global Innovation Index** (GII), published by the World Intellectual Property Organization (WIPO). The index assesses the innovation potential and performance of countries based on more than 80 indicators grouped into seven main pillars: institutions, human capital and research, infrastructure, market sophistication, business sophistication, knowledge and technology, and creative outputs. The index also includes two aggregated scores – the Innovation Input Index and the Innovation Output Index – which make it possible to evaluate the efficiency of transforming resources into results.

The Innovation Input Index reflects the conditions and resources that facilitate the creation of innovations. It encompasses areas such as the stability of the institutional environment, the quality of the education system and the scope of R&D, the level of infrastructure development, the availability of financing, the scale of the domestic market, as well as the development of the business environment and human

resources in science and technology. The higher this index, the more favorable the conditions are for the creation and implementation of innovations.

The Innovation Output Index reflects the actual results of innovation activity, including the number of patents, scientific publications, the level of high-tech exports, and the development of brands, digital products, and creative industries. It thus demonstrates how effectively a country transforms invested resources and conditions into concrete products, services, and knowledge that are recognized both domestically and internationally.

A comparison of these two indices makes it possible to assess the effectiveness of innovation policy. High input values combined with low output values, as observed in Kazakhstan, indicate that the country is not yet sufficiently effective in converting potential into tangible results.

Among upper middle-income countries, Kazakhstan ranks 22nd out of 34, while in the regional group of Central and Southern Asia it holds 3rd place out of 10, which reflects its relative competitiveness within its macro-region. At the same time, the country performed better in the Innovation Input Index (72nd place) than in the Innovation Output Index (83rd place), indicating a relatively weak efficiency in transforming investments in innovation into concrete results. In other words, Kazakhstan spends more on innovation than it gains in terms of scientific and technological output.

Over the past five years, Kazakhstan has shown fluctuations in its overall ranking:

- 77th place in 2020,
- 79th in 2021,
- 83rd in 2022,
- 81st in 2023

This instability reflects the sensitivity of the ranking to methodological changes and domestic reforms.

The indicators for innovation inputs and outputs also varied:

- 60th and 94th in 2020,
- 61st and 101st in 2021,
- 65th and 97th in 2022,
- 68th and 87th in 2023,
- 72nd and 83rd in 2024,

respectively [14]. Thus, despite an increase in investment volume, the country is only partially overcoming barriers in the creation and commercialization of knowledge.

The following graph clearly illustrates the changes in Kazakhstan's positions from 2020 to 2024 (Figure 1.2.1.)

In the field of education and scientific research, public expenditure on education amounted to 4.21% of GDP in 2022. This figure is slightly lower than in 2021 and indicates a consistently high, yet still insufficient, level of sector financing to ensure quality growth. The share of graduates in "science and engineering" fields accounted for 24.06% of total graduates in 2020, which corresponds to the average level for countries with similar income. The number of researchers per million population reached 681.5 FTE in 2022, reflecting the growth of the country's scientific potential. However, R&D expenditure remained extremely low – only 0.12% of GDP. This is significantly behind leading countries, where this indicator exceeds 2–3% of GDP.

An additional signal of declining quality in specialist training was the drop in the average score of Kazakhstan's three leading universities in the QS ranking – from 38.6 to 32.13 in 2023, representing a decrease of 16.7%. At the same time, the student–teacher ratio in secondary schools,

at 8.3, is among the best in the world (16th place), reflecting the relative accessibility of personalized learning in basic education.

In the QS World University Rankings, Kazakhstani universities were distributed as follows:

Al-Farabi Kazakh National University ranked **230th with** a score of 41.60;

L.N. Gumilyov Eurasian National University ranked **355th with** a score of 30.90;

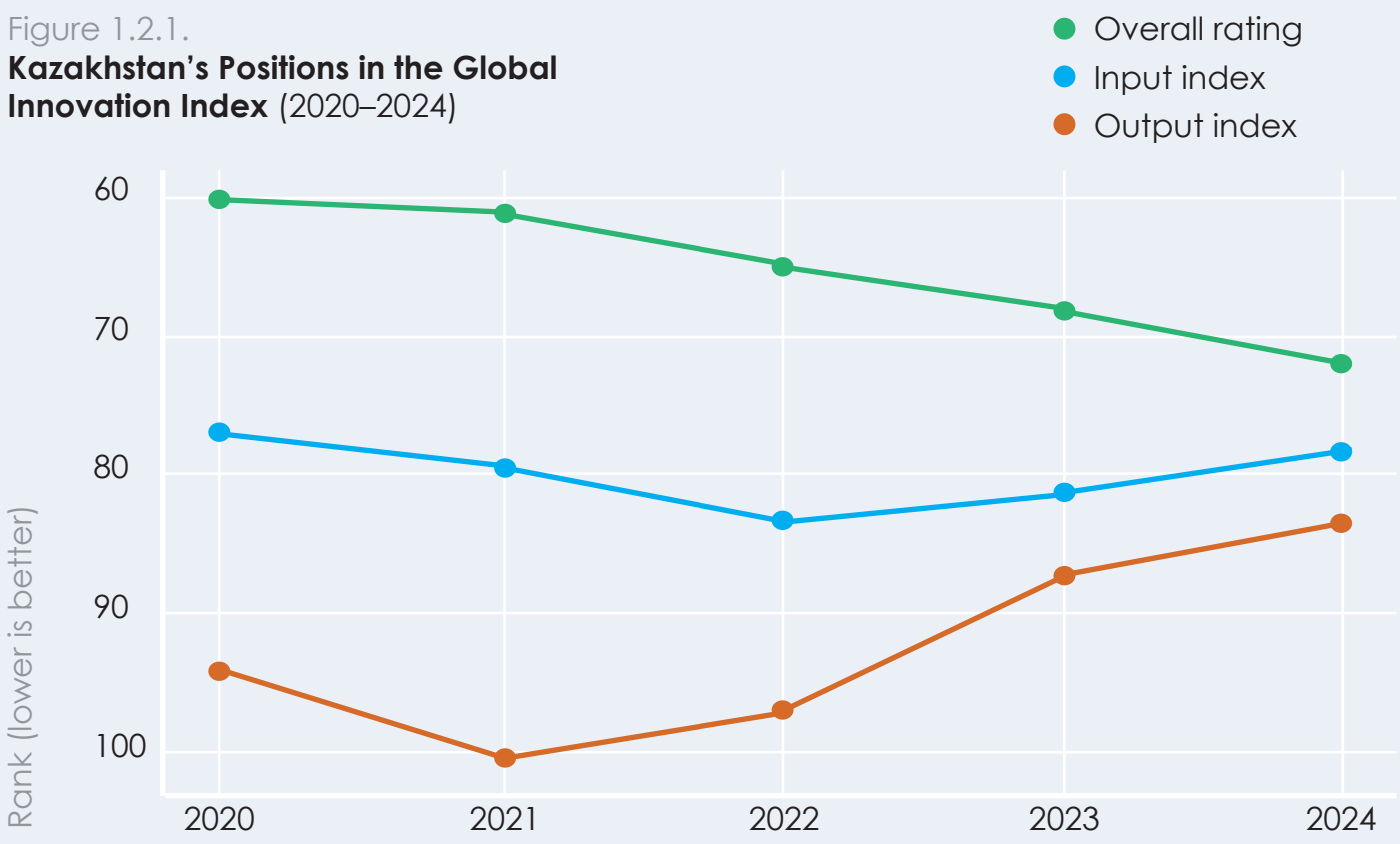
Satbayev University ranked **481st with** a score of 23.90.

Thus, despite their participation in global academic rankings, the level of international recognition of Kazakhstani universities remains limited.

Among Kazakhstan's strengths in the GII 2024 are high positions in indicators such as the level of development of government online services (8th place), the number of utility models per USD 1 billion of GDP (PPP) (10th place), and the high level of e-participation (15th place). These results reflect the advancement of digital infrastructure and an institutional orientation toward openness. Positive assessments are also observed in labor productivity growth (30th place), employment share in knowledge-intensive sectors (32nd place), electricity output (34th place), and the share of high-tech exports in total trade (36th place). These indicators demonstrate the existence of stable growth points in certain sectors of the economy.

At the same time, a number of weaknesses remain. Kazakhstan ranks 128th in terms of software expenditure as a share of GDP, which points to a low level of digital transformation in business. The country is 115th in the number of scientific and

Figure 1.2.1.
Kazakhstan's Positions in the Global Innovation Index (2020–2024)



technical publications, reflecting a weak position in international science. The level of clustering and university–industry collaboration also remains low (114th place). Finally, the low level of R&D investment (98th place) continues to be one of the systemic constraints on scientific and technological development.

Kazakhstan scored 44.25 on the overall index, which is higher than the average for upper middle-income countries (43.0), yet still significantly below the values of leading countries. This highlights the need not only to increase investment, but also to enhance its efficiency and alignment with strategic priorities.

Despite some strengthening of Kazakhstan's overall position in the Global Innovation Index, an imbalance remains between investments in innovation and the outcomes of those investments. For sustainable growth, it is necessary not only to maintain investment in education, digital transformation, and R&D, but also to strengthen the mechanisms for transforming these investments into high-quality scientific, technological, and economic results. Particular attention should be given to stimulating scientific publications, fostering university–business collaboration, and developing clusters and the venture ecosystem.

The Times Higher Education (THE) ranking is one of the most authoritative global academic rankings, covering more than 1,900 universities from 108 countries. The evaluation is based on five key parameters: quality of teaching, research environment, research quality (measured by citation impact), industry income, and international outlook.

In 2024, Kazakhstan maintained a stable presence in the global academic space, as confirmed by the inclusion of four domestic universities in the overall THE ranking. The highest results were achieved by Nazarbayev University, which ranked within the 501–600 band of the world's best universities. This reflects the university's systematic efforts to strengthen its academic reputation, develop research capacity, and expand international partnership s.(Table 1.2.1.) [15]

This table presents the performance of Kazakhstani universities according to the key criteria of the global Times Higher Education (THE) ranking. Each university is assessed across six dimensions: Teaching, Research Environment, Research Quality, Industry Income, International Outlook, and Overall Score.

NAZARBAYEV UNIVERSITY

Nazarbayev University demonstrates confident leadership among Kazakhstani universities. Its overall score of 43.3–45.9 is significantly higher than that of other institutions, largely due to its strong performance in Research Quality (70.5), which reflects high publication activity and citation impact. The university also shows a high level of International Outlook (73.5), indicating substantial participation of international students and faculty, as well as active international collaborations.

The indicators for Teaching (24.3) and Research Environment (29.2) are also competitive, particularly within the context of the post-Soviet space.

Al-Farabi Kazakh National University (KazNU) has an overall score in the range of 25.2–30.6, which is notably lower than that of Nazarbayev University. It demonstrates a relatively strong performance in Teaching (29.4), reflecting its long-standing pedagogical traditions and experience. However, its low results in Research Quality (24.2) and especially in Research Environment (11.9) highlight the need to strengthen scientific infrastructure and improve the quality of scholarly publications. Interestingly, KazNU records one of the highest scores in International Outlook (86.3) – even surpassing Nazarbayev University – which is associated with active international mobility and academic exchange programs.

L.N. Gumilyov Eurasian National University (ENU) shows a low overall score of 10.5–25.1, with moderate values across most categories. Particularly weak results are observed in Research Quality (21.9) and Research Environment (12.4), which indicate limited scientific reputation at the global level. At the same time, the university demonstrates relatively stable performance in International Outlook (52.6), likely reflecting its ongoing policy of internationalization.

Satbayev University has the same overall score range as ENU – 10.5–25.1, with identical values across all criteria, which is most likely due to rounding and the universities' placement in the same ranking band. Despite its strong engineering profile, the university demonstrates only moderate results in Research (24.2) and Teaching (29.4). At the same time, International Outlook (86.3) is exceptionally high – at the level of al-Farabi KazNU, which can be attributed to participation in international programs and joint educational projects..

Against the background of other universities, Nazarbayev University clearly

Table 1.2.1.
Ranking of Kazakhstani Universities in Times Higher Education by Overall and Subject Indicators (2024)

	Overall Score	Teaching	Research Environment	Research Quality	Industry Income	International Outlook
Nazarbayev University	43,3–45,9	24,3	29,2	70,5	45,3	73,5
Al-Farabi Kazakh National University	25,2–30,6	29,4	11,9	24,2	18,3	86,3
L.N. Gumilyov ENU	10,5–25,1	22,1	12,4	21,9	16,1	52,6
Satbayev University	10,5–25,1	29,4	11,9	24,2	18,3	86,3

stands out as Kazakhstan's leading institution according to the key THE criteria. While other universities demonstrate certain strengths – such as international cooperation – they still need to enhance their research capacity, the quality of publications, and the overall academic environment. (Table 1.2.2.) [16].

The presented data reflect the positions of four Kazakhstani universities – Nazarbayev University, Al-Farabi Kazakh National University, L.N. Gumilyov Eurasian National University, and Satbayev University – in the Times Higher Education (THE) Subject Rankings for 2024. The rankings are compiled across key academic fields such as education, engineering, medicine, physical and social sciences, and serve to assess the competitiveness of universities within the international academic and research environment.

Nazarbayev University consistently holds the highest positions. It ranked among the world's top 200 universities in Education (176–200) and demonstrated strong performance in Social Sciences, Medicine and Health, and Engineering, where it is placed in the 401–500 range. These results highlight the university's high standards in teaching, research, and academic reputation.

Al-Farabi Kazakh National University and L.N. Gumilyov Eurasian National University are also represented in most subject rankings; however, their positions fall within lower ranges – from 501 to 1000+. This may indicate the presence of steady research activity, while at the same time highlighting the need to strengthen the international publication base, improve citation impact, and expand teaching in English.

Table 1.2.2.
Positions of Kazakhstani Universities in the Times Higher Education Subject Rankings

Discipline	Nazarbayev University	Al-Farabi KazNU	L.N. Gumilyov ENU	Satbayev University
Education	176–200	501–600	601+	–
Arts and Humanities	401–500	501–600	601+	–
Business and Economics	601–800	601–800	801+	–
Computer Science	501–600	1001+	1001+	–
Engineering	401–500	1001–1250	1001–1250	1251+
Life Sciences	601–800	801–1000	–	–
Medicine and Health	401–500	601–800	–	–
Physical Sciences	601–800	1001+	1001+	1001+
Social Sciences	401–500	601–800	801–1000	–

Satbayev University appeared only in two subject rankings – Engineering and Physical Sciences – and in both cases is positioned in the lower tier of the list. While this reflects its technical profile, it also indicates a limited international presence in other academic fields.

The absence of certain universities in specific subject areas may be attributed to an insufficient number of publications, limited international collaboration, or failure to meet the minimum criteria for ranking. Overall, the data highlight a significant gap among the country's universities and underscore Nazarbayev University as the national leader in education and research quality within international comparisons. (Table 1.2.3.)

In the Times Higher Education (THE) World University Rankings 2024, 18 Kazakhstani universities were included in the Reporter category. This status is assigned to institutions that submitted data for evaluation but were not ranked, as they did not meet the minimum requirements in one or more key criteria, such as publication volume, citation impact, or other indicators of academic reputation. Nevertheless, participation even at the Reporter level demonstrates universities' commitment to increasing transparency, expanding international cooperation, and advancing toward global recognition.

For Kazakhstani universities, inclusion in the Reporter category represents an important step toward internationalization and enhanced competitiveness. It indicates that the institution is already making efforts to improve the quality of education and research, while striving to meet international standards. Reporter status also provides universities with the opportunity to receive feedback from THE on their submitted data and to use this input for targeted improvement of weaker areas.

The Reporter list included both leading national universities (Abai Kazakh National Pedagogical University, Khoja Akhmet Yassawi International Kazakh-Turkish University, S.D. Asfendiyarov Kazakh National Medical University) and a number of regional and sectoral institutions (Academy of Civil Aviation, Almaty Technological University, International Information Technology University, Zhubanov University, Zhetysu University, among others). This reflects the broad participation of Kazakhstani universities in international ranking initiatives and confirms their commitment to the sustainable development of higher education across the country.

Thus, Reporter status should not be viewed as a shortcoming, but rather as a starting point for further growth and for strengthening positions within the global academic community.

QS

В 2024 году Казахстан In 2024, Kazakhstan demonstrated steady progress in the prestigious QS World University Rankings. A total of 21 Kazakhstani universities were included in the global ranking, reflecting the positive development dynamics of the higher education system and strengthening the country's position as an educational hub in Central Asia.

The QS World University Rankings are compiled based on the assessment of universities across the following key criteria: academic reputation, employer reputation, faculty-to-student ratio, research citation impact, and the proportion of international faculty and students. The QS methodology takes into account both academic excellence and the international attractiveness of universities.

In 2024, the following Kazakhstani universities were represented in the QS World University Rankings (Table 1.2.4.)[17].

In addition to the global ranking, QS annually publishes subject rankings that evaluate the world's strongest universities in specific academic fields.

In 2024, seven Kazakhstani universities were included in the QS subject rankings. The most widely represented were Al-Farabi Kazakh National University (in 13 subject areas) and L.N. Gumilyov Eurasian National University (in 10 areas). These institutions distinguished themselves in fields such as education, law, economics, mathematics, physics, anthropology, and agriculture.

Table 1.2.3.
Universities of Kazakhstan with Reporter Status (THE, 2024)

Abai Kazakh National Pedagogical University	Almaty University of Humanities and Economics
Khoja Akhmet Yassawi International Kazakh-Turkish University	Atyrau University
Almaty Technological University	D. Serikbayev East Kazakhstan Technical University
S.D. Asfendiyarov Kazakh National Medical University	Kokshetau University
Astana International University	Zhubanov University
Academy of Civil Aviation	Auezov University
International Information Technology University	Q University
Kazakhstan-British Technical University	South Kazakhstan University
Women's Pedagogical University	Zhetysu University

Table 1.2.4.
Positions of Kazakhstani Universities in the QS World University Rankings 2024

University	QS 2024 Ranking Position
Al-Farabi Kazakh National University	230
L.N. Gumilyov Eurasian National University	355
Satbayev University (Kazakh National Technical Research University)	481
M. Auezov South Kazakhstan University	611–620
Abai Kazakh National Pedagogical University	681–690
Kazakh National Agrarian Research University	641–650
Khoja Akhmet Yassawi International Kazakh-Turkish University	781–790
Karaganda Technical University	801–850
E.A. Buketov Karaganda University	851–900
Almaty University of Power Engineering and Telecommunications	801–850
D. Serikbayev East Kazakhstan Technical University	901–950
S.D. Asfendiyarov Kazakh National Medical University	901–950
Kazakhstan-British Technical University (KBTU)	1001–1200
T. Ryskulov Kazakh Economic University (Narxoz University)	1201–1400
KIMEP University (Kazakhstan Institute of Management, Economics and Strategic Research)	951–1000
Ablai Khan Kazakh University of International Relations and World Languages	1001–1200
S. Seifullin Kazakh Agrotechnical University	1201–1400
Suleyman Demirel University (SDU)	1201–1400
M.Kh. Dulaty Taraz Regional University	1201–1400
Pavlodar State Pedagogical University	1201–1400
Korkyt Ata Kyzylorda University	1201–1400

At the same time, of the 21 Kazakhstani universities included in the QS global ranking, 14 are not represented in the subject rankings. This underscores the need for further development of academic programs and research capacity in specialized fields. Kazakhstani universities are nevertheless represented in a number of disciplines that reflect the country's scientific and educational specialization. (Table 1.2.5.)

Thus, the participation of Kazakhstani universities in the QS global and subject rankings reflects the development of the country's academic potential and the international recognition of specific scientific fields. Particularly notable achievements are observed in disciplines such as education, law, economics, physics, and sociology.

Improving ranking positions requires systematic support for universities, including the expansion of academic mobility, the recruitment of international faculty and students, increased publication activity, and the development of research infrastructure.

Human Development Report

According to the Human Development Report 2023–2024, published by the United Nations Development Programme (HDR 2025), the Republic of Kazakhstan demonstrates consistently high performance across key areas of human development. Amid global transformations related to digitalization, geopolitical instability, and environmental challenges, Kazakhstan has maintained its position among the group of countries with a high level of human development.

Based on the results of 2022, the most recent fully verified international data, Kazakhstan's Human Development Index (HDI) stood at 0.812. This level placed the country 60th among 193 states and reflects recovery following the decline during the pandemic [18]. The pace of HDI progress in the post-COVID period is characterized as steadily positive, with the key components of the index being life expectancy, level of education, and per capita income. (Table 1.2.6.)

These components reflect the sustainability and balance of the country's socio-economic development. In particular, the expected years of schooling at 15.3 indicate a developed education system capable of ensuring long educational trajectories and broad coverage across all levels of education, from preschool to higher education. The mean years of schooling of 11.7 also confirm the population's involvement in formal education, while the high value of gross national income per capita reflects access to economic opportunities and relative macroeconomic stability. Life expectancy at birth, amounting to 70.5 years, points to the overall improvement in living conditions and the availability of the healthcare system, despite existing regional disparities.

Thus, the index is formed on the basis of three key dimensions: longevity, knowledge, and a decent standard of living. Kazakhstan demonstrates positive results across all three components, particularly in the field of education, which continues to remain a key factor in the growth of human potential and national competitiveness.

Gender parameters of human development are assessed by the Gender Development

Table 1.2.5.
Representation of Kazakhstani universities in the QS Subject Rankings 2024.

Subject Area	QS 2024 Ranking Position	QS 2023 Ranking Position
Kazakh National Agrarian Research University		
Agriculture	301–350	301–350
Al-Farabi Kazakh National University		
Medicine	501–550	---
Natural Sciences	401–450	451-500
Chemistry	501–550	501-550
Mathematics	251–300	251-300
Physics	451–500	451-500
Social Sciences	327	327
Anthropology	101–150	101-150
Economics	251–300	251-300
Education	201–250	---
Law	201–250	201-250
Politics	201–230	---
Sociology	301–340	---
Satbayev University		
Chemistry	551–600	---
Physics	551–600	551-600
L.N. Gumilyov Eurasian National University		
Physics	451–500	451-500
Social Sciences	256	256
Anthropology	401–450	---
Economics	301–350	301-350
Education	351–380	---
Hospitality	50–100	51-100
Law	151–200	151-200
Politics	151–200	151-200
Sociology	201–250	---
Abai Kazakh National Pedagogical University		
Education	76	76
Law	301–350	301–350
Khoja Akhmet Yassawi International Kazakh-Turkish University		
Education	301–350	301–350

Index (GDI), which in Kazakhstan stands at 0.986. This value indicates a high level of gender parity: women achieve 98.6% of men's HDI indicators. Women in Kazakhstan have a higher life expectancy (75.4 years compared to 66.1 years for men) and follow longer educational trajectories (15.6 expected years of schooling). However, a significant gender gap in income remains ($21,193 for women versus $29,688 for men) [17]. These data highlight the need for additional measures to ensure women's economic inclusion, including the development of vocational education, digital skills, and access to high-paying sectors of the economy.

The Gender Inequality Index (GII) stands at 0.201, placing Kazakhstan 49th among 166 countries. This index takes into account indicators of women's participation in politics (29.1% of members of parliament), the adolescent birth rate (23.1 per 1,000 girls aged 15–19), maternal mortality (13 cases per 100,000 live births), as well as women's engagement in the economy and education (91.5% of women have access to secondary and higher education, and 66.5% are involved in the labor market) [17].

The combination of these parameters makes it possible to conclude that Kazakhstan has achieved significant progress in expanding opportunities for women, particularly in the field of education, which creates an institutional foundation for their further integration into managerial, scientific, and technological spheres.

Additionally, HDR 2025 considers the Planetary Pressures–Adjusted Human Development Index (PHDI), which reflects the impact of carbon emissions and resource consumption intensity. Kazakhstan's PHDI is 0.734, which is 0.078 points lower than its basic HDI. This highlights the need to strengthen environmental policy, including in the field of education through the development of environmental awareness, "green" programs, and sustainable technological solutions. In the context of the education strategy, this implies the necessity of integrating environmental and sustainability competencies into school and university curricula.

At the same time, the Multidimensional Poverty Index (MPI), designed to assess deprivations in health, education, and living standards, was not calculated for Kazakhstan in the HDR. The reason may lie either in the absence of national data consistent with the methodology of global monitoring, or in the relatively low level of poverty according to international scales. The lack of an MPI assessment underscores the need to establish a national system of multidimensional vulnerability indicators, particularly with regard to regional and rural contexts

The HDR places significant emphasis on the transformational challenges and opportunities associated with the development of artificial intelligence (AI). However, Kazakhstan is represented in the AI section only in aggregated form (as part

Table 1.2.6.
Main Components of Kazakhstan's Human Development Index (2022)

Indicator	Value
Life expectancy at birth	**70,5 years**
Mean years of schooling	**11,7 years**
Expected years of schooling	**15,3 years**
Gross national income per capita (PPP)	**25 317 USD**

of the group of countries with a high level of HDI), without the publication of detailed country-level data. The main reasons for this absence are that Kazakhstan was not included in the list of countries participating in the UN global survey on AI and human development, and that it remains underrepresented in international databases on digital skills, AI platforms, and patent activity. In addition, the country is not yet among the global producers of AI technologies and does not participate in cross-country monitoring initiatives (such as the Stanford AI Index or the OECD AI Policy Observatory).

This poses a challenge for the national statistical system and strategic agencies, including in the field of education, in terms of collecting, aggregating, and presenting data on the integration of AI into educational practice, the training of specialists for the digital economy, and the development of research capacity in the area of machine learning.

In this context, it appears advisable for Kazakhstan to establish its own system of indicators on AI in education, healthcare, and employment, including through regular national surveys of students' and teachers' digital skills, the level of AI integration into the learning process, as well as monitoring of regional disparities.

Thus, the indicators presented in the HDR confirm Kazakhstan's progress in ensuring a high level of human development, particularly in the areas of education and gender equality. At the same time, systemic challenges remain, requiring the integration of the environmental component, digital inclusion, and the development of institutional capacity for measuring and managing transformations related to artificial intelligence. For the education system, this implies the need to focus on fostering critical thinking, sustainable and digital skills, as well as integrating AI both as a tool and as a subject of learning – with the aim of further enhancing the quality of the country's human capital.

1.3. Centers of Academic and Research Excellence: the driving force behind the transformation of the higher education system

The establishment of Centers of Academic Excellence (CAEs) is a targeted, systemic public policy aimed at strengthening the quality, competitiveness, and sustainability of the national higher education system. This initiative is set out in the Concept for the Development of Higher and Postgraduate Education of the Republic of Kazakhstan for 2023–2029 as one of the key instruments for achieving the strategic goal of building strong universities capable of integrating into the global academic community and making a meaningful contribution to the development of the knowledge economy.

CAEs are created on the basis of leading national and regional universities in order to concentrate research, human, and infrastructure resources in priority areas of science and technology that correspond to the current needs of the economy and society. This approach increases the efficiency of investment in education and science, minimizes the dispersion of resources, and ensures a critical mass of competencies to achieve international competitiveness.

As part of the strategic plan to establish centers of academic excellence in the country, 15 regional and 5 pedagogical universities have been selected:

- K. Zhubanov Aktobe Regional University
- I. Altynsarin Arkalyk Pedagogical Institute
- Kh. Dosmukhamedov Atyrau University
- D. Serikbayev East Kazakhstan Technical University
- I. Zhansugurov Zhetysu University
- M. Utemisov West Kazakhstan University
- Kazakh National Women's Pedagogical University
- Abai Kazakh National Pedagogical University
- Academician E.A. Buketov Karaganda University
- Sh. Yessenov Caspian University of Technology and Engineering
- Sh. Ualikhanov Kokshetau University
- A. Baitursynov Kostanay Regional University

- Korkyt Ata Kyzylorda University
- Khoja Ahmed Yasawi International Kazakh–Turkish University
- A. Margulan Pavlodar Pedagogical University
- M. Kozybayev North Kazakhstan University
- M.Kh. Dulaty Taraz Regional University
- Toraighyrov University
- Shakarim University of Semey
- South Kazakhstan State Pedagogical University

Thus, the NQF and CAEs form a two-tier system: the National Qualifications Framework provides universal qualification standards and the methodological foundation, while the Centers of Academic Excellence adapt and concentrate these standards within specific priority areas, ensuring their practical relevance. This approach makes it possible to maintain the integrity of the national higher education system while accommodating the diversity of needs across sectors of the economy, thereby improving the quality of human capital and its alignment with the contemporary requirements of the labor market.

Conceptually, the program rests on four key pillars that span all domains of a modern university's activity: academic excellence in educational provision, academic excellence in research, academic excellence in governance (good governance), and academic excellence in delivering the university's "third mission"–its contribution to the social and economic development of society.

Within the framework of the Centers of Academic Excellence (CAEs), universities strengthen their research and teaching capacities, expand international partnerships, implement modern governance models, and focus on training specialists with skills in demand in high-tech sectors. These centers become not only flagships of scientific and educational activity but also drivers of regional development, helping disseminate best practices and raise overall educational quality across the country. Consistent implementation of this policy makes it possible to build a sustainable university ecosystem that adapts to global challenges and supports the state's strategic priority–developing human capital and an innovation-driven economy.

As part of the project "Establishing Centers of Academic Excellence," systematic, institutionally structured work is being carried out to improve the quality of higher education and research in Kazakhstan. By Order of the Minister of Science and Higher Education of the Republic of Kazakhstan No. 127 **of March 26, 2024, Methodological Guidelines were approved for creating CAEs on the basis of higher and postgraduate education institutions (HPEIs).** These Guidelines formalize the mechanisms for implementing the academic excellence program and set out a clear vision and the main directions for developing CAEs as instruments of university transformation.

The Methodological Guidelines further detail and operationalize the conceptual pillars of the CAE model, providing practical content for each of the four complementary areas. Each area includes clearly defined goals, tasks, and performance indicators aimed at institutional strengthening and the sustainable development of HPEIs.

1. Academic Excellence in Teaching and Learning

Objective To enhance the quality of degree programs, deepen international academic integration, and strengthen graduates' competitiveness in both global and national labor markets.

Key tasks include

- Reviewing and updating curricula to align with the needs of the real economy;
- Developing the human capital of the academic staff (faculty capacity building);
- Expanding joint programs with universities ranked in the global Top-700;
- Increasing the share of international students and faculty;
- Introducing specialized accreditation and strengthening academic reputation.

Performance evaluation indicators for Direction (17)

1. Share of degree programs ranked in the national and global Top-500
2. HEI's position in institutional rankings (Top-700)
3. Number of faculty holding academic awards and grants
4. Share of international students
5. Share of international faculty
6. Number of joint educational programs (JEP)
7. Number of double-degree programs (DDP)
8. Share of programs with specialized accreditation
9. HEI's academic reputation
10. Graduate employment rate
11. Median graduate salary
12. Share of graduates in leadership positions
13. Share of innovative programs developed at industry's request
14. Share of applied capstone theses aligned with regional priorities
15. Share of research projects conducted with regional businesses
16. Number of updated programs (per the Occupational Atlas)
17. Reputation among employers

2. Academic Excellence in Research Activities

Main objectives

- modernization of research infrastructure, including laboratories and research centers;
- concentration of research personnel in priority and niche areas;
- expansion of interdisciplinary and transnational scientific cooperation;
- development of mechanisms for commercialization of research outputs and attraction of extrabudgetary funding sources.

Performance indicators for Direction II (14)

1. Share of faculty involved in research activities
2. Number of patents
3. Citation rate of scientific articles per researcher
4. Number of articles in Q1/Q2 journals
5. Share of certified research laboratories
6. Technology readiness level of higher education institutions
7. Projects with national and international research institutes/ universities
8. Number of scientific journals indexed in international databases
9. Share of revenue from research and commercialization
10. Share of innovative products in the Gross Regional Product (GRP)
11. Share of research projects funded from extrabudgetary sources
12. Share of research projects addressing technological challenges
13. Number of grant applications
14. Number of young researchers in Master's and PhD programs

3. **Academic Excellence in Governance** (Good Governance)

Goal to establish a sustainable system of strategic management aligned with the principles of academic freedom and corporate governance.

Main objective

- implementation of a model of strategic and project-based management;
- development of personnel and HR policies;
- digital transformation and modernization of infrastructure;
- ensuring financial sustainability, including the establishment of endowment funds;
- undergoing institutional accreditation.

Performance indicators for Direction III (14)

1. Quality of development programs and plans
2. Share of stakeholders involved in corporate governance
3. Employee satisfaction with working conditions
4. Professional development and training of faculty and staff
5. Institutional revenue per employee

6. Median salary of faculty and staff
7. Share of expenditures on laboratory development
8. Share of attracted investments
9. Share of revenue from commercial activities
10. Share of funds in the endowment fund
11. Availability of institutional accreditation
12. Number of social and community initiatives
13. Level of digitalization of management
14. Financial sustainability (diversification of funding sources)

4. Academic Excellence in the Implementation of the Third Mission of Universities

Goal to expand the contribution of universities to the socio-economic development of regions and to strengthen sustainable partnerships with local communities, businesses, and public authorities.

Main objectives

- formation of educational and research priorities in line with regional needs;
- participation in the development of regional Atlases of Professions;
- implementation of programs of non-formal learning and social entrepreneurship;
- execution of socially significant projects.

Performance indicators for Direction IV (6)

1. Projects with regional companies/ akimats (local authorities)
2. Participation in developing Occupational Atlases
3. Non-formal education programs for the public
4. Coverage of non-formal education programs
5. Number of social projects implemented
6. Level of engagement with local employers

A balanced implementation of all four areas of CAE activity makes it possible to build a coherent model for developing universities as centers of expertise, innovation, and drivers of socially significant change. Each area is logically interconnected with the others: raising the quality of education is impossible without a strong research base; effective governance underpins the sustainability of all processes; and delivering the university's third mission cements its role as an active participant in social transformation and a catalyst of regional development. This model ensures the long-term sustainability of Kazakhstan's HEIs and their integration into the global academic space.

The establishment of CAEs is being carried out in stages through three competitive rounds of program-targeted funding: **2024–2026, 2025–2027, and 2026–2028.**

In **April 2024,** the first competition for program-targeted funding of research for **2024–2026** was held, comprising scientific and technical assignments in the following strategically important areas:

- ecology, environment, and rational use of natural resources;
- energy, advanced materials, and transport;
- advanced manufacturing, digital and space technologies;
- life and health sciences;
- sustainable development of the agro-industrial complex.

Based on the results of the competition, six universities were selected as winners, on the basis of which work has begun to establish CAEs:

- Zhubanov Aktobe Regional University
- Serikbayev East Kazakhstan Technical University
- Yessenov Caspian University of Technology and Engineering
- Baitursynov Kostanay Regional University
- Akhmet Yasawi University
- Dulaty Taraz Regional University

The creation of CAEs is organized as a sequential and structured process that encompasses both financing mechanisms and comprehensive institutional support. Under the **program-targeted funding (PTF)** scheme, these six universities have already begun implementing measures across the four key pillars of academic excellence– **education, research, governance**, and **the third mission** of universities.

Their activities are monitored systematically against **51 indicators**, ensuring comparability, coherence, and effective management of results. The remaining 14 universities are in the preparation phase and will commence implementation of the relevant programs in stages. Support for all **20 universities** is provided by the **Project Management Office** at the **National Center for the Development of Higher Education** under the **Ministry of Science and Higher Education**.

The Office delivers methodological and advisory support as well as regular program monitoring, including engagement with international partners such as the **World Bank.** This approach helps build a sustainable ecosystem of academic excellence and form a critical mass of universities capable of setting a new benchmark of quality for the entire higher education system of Kazakhstan.

1.4. Endowment Funds as an Instrument for Diversifying University Funding Sources

The development of higher education and science in Kazakhstan has entered a stage that requires a fundamentally new financial architecture–one that ensures long-term sustainability, academic autonomy, and international competitiveness. Under these conditions, the limitations of a model heavily dependent on public funding for universities and research organizations have become evident. Such reliance reduces the system's flexibility and resilience amid mounting global challenges, economic volatility, and intensifying competition for resources and talent. One of the strategically important tools for transitioning to a new model of sustainability is the **endowment fund**–a fund of permanently invested capital whose income is directed to advancing the university's mission.

In the absence of an effective, legally codified endowment-financing framework, universities and research organizations in Kazakhstan remain highly dependent on the state budget and short-term project support. This model constrains their strategic resilience, fragments financial planning, and leaves development vulnerable to economic fluctuations and shifting budgetary priorities.

As of **2024**, approximately **22 endowment funds** are registered in Kazakhstan; however, their **combined capitalization does not exceed 1 billion tenge**–insufficient to generate a meaningful investment return. Only a few funds demonstrate relative stability, notably **IQanat** (about **USD 20 million**) and the fund at the **Republican Physics and Mathematics School (RFMSH)** (about **2 billion tenge**). Nevertheless, the lack of a clear legal framework governing investment activities, the regulation of charitable contributions, and the protection of donors' interests limits further growth. Current legislation does not allow for an institutional model that combines the functions of charitable organizations and investment funds within a single structure.

There is likewise no legal protection of donors' interests, since property rights to designated (earmarked) contributions are not codified. For example, unlike endowment funds, in charitable foundations such funds are subject to alienation and pass under the control of the organization. In addition, mechanisms for overseeing the targeted

use of endowment income are not regulated, and there are no incentives for businesses or individuals in the form of tax benefits–factors that significantly constrain the inflow of private capital. All this creates an institutional vacuum in which the mechanism for the long-term accumulation and sustainable use of resources in the interests of science and education remains underdeveloped and of limited applicability.

In such an institutional vacuum, the need grows for stable financial instruments capable of ensuring continuity and a strategic orientation of development. This is precisely the function performed by endowment funds. They play a key role in securing a diversified funding model, reducing dependence on short budget cycles and creating the conditions for long-term strategic planning. By building their own investment resource, universities can support priority educational and research areas, provide scholarships and grants, modernize infrastructure, and strengthen ties with society, business, and alumni. In this way, an endowment becomes not merely a source of additional income, but an institutional marker of a university's maturity, trust, and accountability.

Particular attention to the development of endowment funds is being paid at the highest political level. On **12 April 2023**, the President of the Republic of Kazakhstan, **Kassym-Jomart Tokayev**, speaking at the first meeting of the **National Council for Science and Technology**, instructed the Government to draft a separate law regulating the activities of endowment funds. This initiative fits organically into the strategic course toward a new, open model of science, proclaimed by the Head of State in **May 2022** during the anniversary session of the **National Academy of Sciences**.

Within this model, **university science** occupies a central place, and its sustainable development is ensured through **extrabudgetary sources**–primarily private investment. The conceptual foundations of **open science**, laid down in **1945** by U.S. science advisor **Vannevar Bush**, today underpin the science policies of leading countries [19].

International experience confirms the effectiveness of this model.

For example, in the United States the combined capitalization of university endowment funds exceeds **USD 839 billion**. Harvard, Yale, Princeton, and MIT receive **30% to 50%** of their annual budgets from endowment income. The success of these systems is underpinned by a clear legal framework, tax incentives, and fiduciary trust-management institutions with strict liability.

Similar practices are evolving in Europe and Asia: in **Germany** and **France**, endowments support long-term academic programs; in **Singapore** and **South Korea**, they have become part of strategies to position universities as global research hubs. In the **Russian Federation**, since 2006 a special law ("On the Procedure for Forming and Using the Target Capital of Non-Profit Organizations") has been in force, under which more than **90 university endowment funds** have been established. Thus, across countries with diverse economic and legal systems, the endowment is recognized as an effective mechanism for building sustainable educational ecosystems.

The introduction of endowment funds in **Kazakhstan**, as in a number of countries with successfully developing research ecosystems, is timely in the context of transitioning to a new model of science. Historically, Kazakhstan followed a mobilization-type, Soviet model characterized by dominant state

Figure 1.4.1.
International Experience

Ministry of Science and Higher Education of the Republic of Kazakhstan

Endowment funds operate most successfully in the U.S.

Total capitalization:

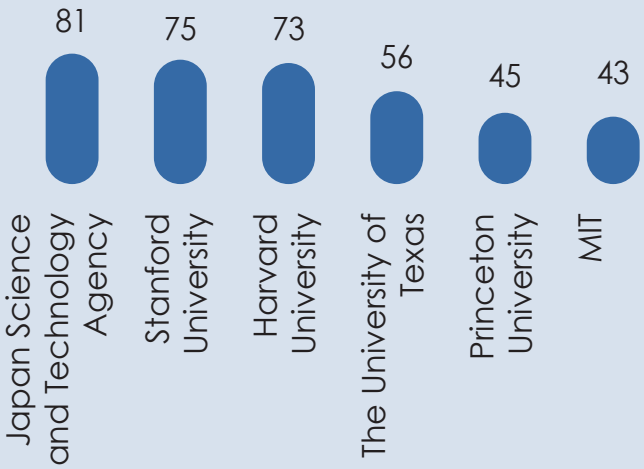
USD 839 billion.

USA	**USD 839 billion.**
UK	**USD 21 billion.**
Singapore	**USD 20.7 billion.**
Japan	**USD 8.2 billion.**
South Korea	**USD 0.42 billion.**

One quarter
of the budgets of leading American universities comes from endowment income

For European universities, endowment funds are a supplementary source of financing.

Institutions with the largest donations in 2023 (USD billions)



The establishment of endowments is regulated by the 2006 Federal Law "On the Procedure for Forming and Using the Targeted Capital of Non-Profit Organizations."

96 Russian universities have endowment funds. Those with the largest endowments include:

MGIMO	**RUB 1 900 million**
St. Petersburg State University	**RUB 1 060 million**

The principal act regulating endowment activity in the U.S. is the Uniform Prudent Management of Institutional Funds Act (UPMIFA).

Both U.S. and Russian law provide tax deductions for donors contributing to the formation of targeted capital for non-profit organizations.

involvement, limited engagement of the private sector, a fragmented structure of research institutes, and their weak linkage to the real needs of the economy. A shift toward an open, competitive, and economically integrated system requires different mechanisms. In line with the **President of the Republic of Kazakhstan's** strategic vision, priority areas for the development of science include increasing

private investment in R&D, developing university science, actively promoting the **commercialization of research**, and **creating sustainable funding sources**. These priorities are further elaborated in the decisions of the **National Council for Science and Technology**. In this context, endowment funds become a focal point of the new model, in which the university is not merely a consumer of resources but an active player that builds capital for the future development of science and education. (Figure 1.4.1.)

The strategic vision of President Kassym-Jomart Tokayev laid the groundwork for a comprehensive legal and institutional transformation aimed at transitioning to an open model of science in which universities become key drivers of sustainable development, capable of attracting extrabudgetary funds on a long-term basis.

Advancing these initiatives, an interagency working group was established under the Ministry of Science and Higher Education in **April 2023**, comprising representatives of relevant government bodies, existing endowment funds, the Association of Financiers of Kazakhstan, the AIFC, international experts, and university representatives. Over the course of **2023**, more than **ten** working meetings were held. A **Consultative Regulatory Policy Paper** was published twice (in **June** and **October 2023**) on the "Open NLA" portal, ensuring transparency and stakeholder engagement. In parallel, a broad information and outreach campaign was conducted. Presentations of the draft law were delivered at high-profile **Capital Market Kazakhstan conferences** (in **2023** and **2024**), as well as within international endowment forums hosted by **L.N. Gumilyov ENU**, the **Association of Financiers of Kazakhstan**, and the **National Endowment Association of Russia**.

Both domestic and foreign experts actively participated in the discussion, including participants of the **"Perpetual Funds" Assembly i**n St. Petersburg.

As a result of these discussions, in **2024** two draft laws–**"On Target Capital (Endowment) Funds"** and **"On Amendments and Additions to Certain Legislative Acts"**–were submitted to Parliament. (At the second reading during the plenary session of the Mazhilis, the draft law was adopted on **28 May 2025.**) Adoption of the bills is the culmination of more than two years of comprehensive work and confirms a high level of public and expert consensus on introducing a new form of sustainable financing for science and education.

The draft law was prepared with due regard to international best practices **(United States, United Kingdom, Australia, Germany, Singapore)** and provides for the creation of a special legal form–**target capital (endowment) funds**–which combine the nature of charitable and investment activities.

The draft law provides for the codification of fundamental provisions to ensure the transparency, accountability, and reliability of such funds. In particular, it proposes to legally define an **endowment** as a **designated (targeted) contribution** intended for the **long-term preservation of capital** and the **use of investment income** to meet the needs of education and science. It envisages the establishment of a **target capital (endowment) fund** as a **separate legal entity** endowed with a special legal status and the function of **fiduciary (trust) management** of donors' assets. To ensure the lawful and efficient use of resources, a **supervisory mechanism** for monitoring the **targeted use of assets** is introduced, which will prevent misuse of funds and strengthen public and donor confidence. The **property rights of contributors** to transferred assets are explicitly secured, providing legal protection for private and institutional investors. **Tax incentives** and other forms of state support will play a significant role in creating incentives for participation

in the development of endowments– particularly relevant given the need to attract private investment into science and education. Finally, a key provision will be the **safeguarding of endowment assets**, including rules on **permissible financial instruments and minimum requirements** for management organizations. Taken together, these measures create a solid legislative foundation for building an effective and sustainable system of endowment funds in Kazakhstan. Thus, the draft law establishes the core principles of operation–**legality, fiduciary responsibility, intergenerational equity, transparency, and efficiency in the use of funds.**

The draft law proposes to introduce the concept of a **targeted contribution agreement** with a **mandatory minimum term of at least 10 years**, secures the **property rights of contributors** over the assets contributed, and regulates the **governance structure** of funds (**Board of Trustees,** executive body, **internal audit service**). It also sets out the rules for **accounting**, **annual reporting,** and **external auditing**. **Asset management** of an endowment fund is assigned either to the fund itself (if it holds the appropriate license) or to a **specialized fiduciary asset-management company** licensed by the competent financial market authority. When the endowment's capital **exceeds the threshold of 10,000 MCI (Monthly Calculation Index)**, the assets must be **entrusted to a licensed asset-management company.**

It is envisaged that the procedure for selecting a management company (fiduciary) to oversee the assets of an endowment fund will be established on the basis of an open competition, taking into account clearly defined criteria aimed at ensuring professionalism, reliability, and transparency. The main criteria under consideration include: possession of a license, professional experience in the securities market, sound reputation and absence of violations, the existence of an effective system of internal control and risk management, as well as a regulated procedure for investment and asset management. This approach ensures the selection of a fiduciary capable of safeguarding capital, managing income transparently, and adhering to the principles of prudent and responsible investment in the interests of the sustainable development of scientific, educational, and social organizations.

Restrictions are also set on the administrative expenses of the fund (no more than 15% of income) along with strict requirements for the targeted use of income. In this way, the reform eliminates the previously existing institutional vacuum and establishes a regulatory basis for attracting private capital to the development of social and scientific infrastructure.

In parallel with the core law, amendments have been prepared to the Civil Code, the Law "On Education," and the Law "On Charity," ensuring consistency and coherence in legal regulation. At the same time, a number of universities participating in the Academic Excellence Program have begun preparing infrastructure for launching their own funds, including the formation of supervisory boards, the development of investment policies, and the establishment of communication channels with donors.

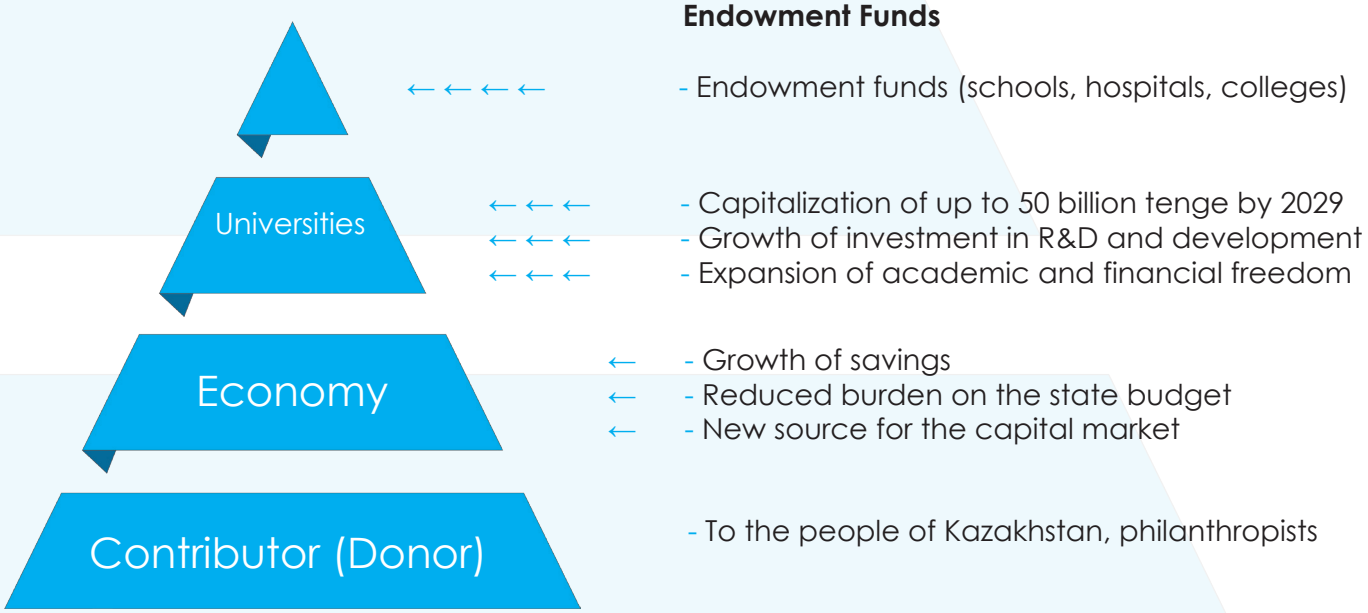
Furthermore, within the framework of parliamentary consideration of the draft law, proposals have been introduced to amend the Tax Code of the Republic of Kazakhstan aimed at creating a favorable fiscal environment for participants in the endowment fund system. Specifically, the consolidated bill on amendments and additions to legislation on taxation includes tax incentives, such as the introduction of a super-deduction of up to 300% under corporate income tax for targeted contributions to endowment funds. Also envisaged are exemptions from taxation on property and income of endowment funds,

as well as tax preferences for beneficiary organizations. Such measures establish a powerful motivational mechanism that makes participation in the development of endowments financially attractive not only for philanthropists and individuals, but also for the corporate sector, including large companies and subsoil users. For the latter, in particular, the possibility is proposed to allocate up to 1% of their contractual obligations to the development of universities, thereby creating a precedent for long-term and mutually beneficial partnerships between business and the academic sector.

The launch of endowment funds in Kazakhstan represents not only a legal reform but also an institutional shift toward a sustainable, modern, and integrated model of financing science and education. This mechanism allows universities to move beyond dependence on external cycles and the state budget, enabling them to set their own priorities and pursue long-term strategic goals (Figure 1.4.2). The endowment is becoming a new norm–a norm of a mature and independent academic environment built on public trust, economic partnership, and contribution to the country's future. Thus, the development and adoption of the draft law on endowment funds marks a transition to a new model of financing science and higher education in Kazakhstan, one based on trust, transparency, and accountability. Incorporating endowments into the regulatory framework paves the way for building an institutionally mature environment in which universities can not only ensure stability but also become active participants in the knowledge economy.

Following the entry into force of the law, pilot endowment funds are planned to be established at five universities with a total capitalization of no less than 50 billion tenge. The draft law also pursues a broader goal–building a comprehensive regulatory and organizational framework that will ensure the sustainable growth of the endowment fund system and allow the overall capitalization to reach 50 billion tenge by 2029. Thus, the launch of the endowment fund system will not only strengthen the financial independence of universities but also structure interaction between the state, business, and society on the principles of trust, transparency, and responsibility for the country's future.

Figure 1.4.2.
Endowment Funds



CONCLUSIONS

The contemporary development of higher education in Kazakhstan is taking place in the context of global transformations, where education is becoming a key factor in addressing global challenges—from poverty reduction to ensuring sustainable development. UNESCO data indicate that the growth in student numbers and the expansion of academic mobility are accompanied by persistent inequalities in access to educational opportunities. In response to these challenges, Kazakhstan is shaping its own strategy, enshrining education as a fundamental social right in the Constitution and formulating a policy that integrates economic, social, and cultural objectives.

At the same time, state policy in the field of education is based on the understanding that universities are not only platforms for workforce training, but also key institutions for the development of human capital, civic identity, and cultural values. Legislative initiatives of recent years demonstrate a focus on qualitative transformation, including the expansion of academic freedom, diversification of governance models, stimulation of research productivity, and the introduction of differentiated funding instruments.

Логическим продолжением One of the key outcomes of these reforms has been the strengthening of internationalization. Kazakhstani universities are actively increasing their presence in international academic rankings. Participation in systems such as the **QS World University Rankings** and **Times Higher Education** has become an important indicator of competitiveness, as it enables universities to integrate into the global higher education space, build academic reputation, and attract international students and faculty. For Kazakhstan, progress in global rankings is not an end in itself, but rather a tool for improving the quality of education and research, expanding international cooperation, and consolidating the country's status as a regional educational hub and exporter of knowledge.

The next step in institutional strengthening was the adoption of the new Law "On Science and Technology Policy" (2024), which brought together the objectives of science, technology, innovation, and education into a unified system. The updated status of research universities, the digitalization of processes, and the introduction of standards of research ethics form the foundation for a more open, productive, and competitive research environment capable of integration into global research networks.

In this context, the establishment of Centers of Academic Excellence (CAEs) is of particular importance, as they are intended to serve as drivers of regional and national development. The concentration of resources and competencies within leading universities enables the formation of an integrated model of a new type—focused on the quality of education, research productivity, modern governance, and social mission. The pilot implementation of the program in six universities already demonstrates a systemic approach based on clear performance indicators and institutional support. In the long term, CAEs create conditions for strengthening research capacity, improving workforce training,

and fostering a knowledge-based economy.

Alongside institutional reforms, a new financial architecture of higher education is also taking shape. Endowment funds are becoming a key instrument for diversifying revenue sources and ensuring the long-term sustainability of universities. Under conditions of limited reliance on the state budget model, endowments create independent resources to support priority educational and research projects. International experience confirms the effectiveness of endowment funds, while the adoption of a dedicated law in Kazakhstan establishes a solid legal framework for their institutionalization. Transparent governance mechanisms, tax incentives, and guarantees for capital preservation enhance the attractiveness of participation for businesses and society, turning endowments into a marker of the maturity of the academic environment and public trust in universities.

Thus, Kazakhstan's contemporary higher education policy demonstrates a comprehensive and strategically balanced approach. The combination of internationalization, institutional reforms, the establishment of Centers of Academic Excellence, and the launch of endowment funds contributes to the formation of a resilient university ecosystem. This system not only prepares in-demand professionals and strengthens human capital, but also lays the foundation for a knowledge-based economy and the country's intellectual sovereignty in the context of global competition.

Chapter 2.

Development of Higher and Postgraduate Education: Current State and Dynamics

2.1. **Educational Programs in Higher Education:** From Traditional Models to Innovative Approaches

The education classification system in Kazakhstan is structured on the basis of a clear hierarchy of levels and fields of study, ensuring consistency between educational policy, labor market needs, and the National Qualifications System (NQS). The levels of education–from technical and vocational to higher and postgraduate– are classified in accordance with the State Compulsory Standards of Education (SCSE) and coded according to the international system developed by UNESCO (International Standard Classification of Education – ISCED) [20].

Within higher education, the approved Classifier of Fields of Training (Order of the Ministry of Education and Science of the Republic of Kazakhstan of October 13, 2018, No. 569) is applied, which includes 12 fields of education and more than 68 bachelor's degree programs, 68 postgraduate programs (master's/residency), and 65 doctoral programs (Table 2.1.1). Each field is designated by a seven-digit code reflecting the level and field of education (e.g., 6B01 – Pedagogical Sciences), which enables universities to design educational programs in line with professional standards, SCSE requirements, and the qualification frameworks established in the NQS.

Thus, the system allows for a seamless vertical progression of qualifications across all levels within a given field of education. This ensures modular credit accumulation, academic mobility, and the recognition of qualifications at both national and international levels.

With the transition to academic and managerial autonomy, Kazakhstani universities gained the right to independently develop and implement educational programs, which became a key element in the modernization of the higher education system. Academic freedom means that universities independently determine the structure and content of their programs, adapting them to labor market needs, the country's strategic priorities, and their own scientific

Table 2.1.1.
Classification of Fields of Education

Pedagogical Sciences	**Arts and Humanities**	**Social Sciences, Journalism and Information**
Business, Management and Law	**Natural Sciences, Mathematics and Statistics**	**Information and Communi-cation Technologies**
Engineering, Manufacturing and Construction	**Agriculture and Bioresources**	**Veterinary Science**
Healthcare	**Services**	**National Security and Military Affairs**

schools. At the same time, this freedom is exercised within a clearly structured regulatory framework. Educational programs undergo a licensing procedure, and successful completion is confirmed by inclusion in the Register of Educational Programs of the Ministry of Science and Higher Education of the Republic of Kazakhstan. Entry into the Register serves as legal confirmation that a program complies with the State Compulsory Standards of Higher and Postgraduate Education.

ҚР ҰКП НПП РК
ATAMEKEH

In order to enhance transparency and provide applicants with objective information on the quality of higher education, the National Chamber of Entrepreneurs "Atameken," together with the Ministry of Science and Higher Education, annually compiles a ranking of university programs in Kazakhstan. The ranking of educational programs, published in January 2025, presents an objective and comprehensive assessment of the quality of student training across 2,051 bachelor's programs in 95 universities of the country, based on the results of 2024. The evaluation methodology is based on four blocks of criteria:

- graduates' career prospects (49 %),
- quality of the program (24 %),
- student achievements (16 %)
- institutional indicators of the university (11 %).

More than 100 independent industry experts from all regions of the country took part in the evaluation. Among the fields with the highest graduate employment rates were

- «Computer Science and Robotics» (98 %),
- «Technical Physics» (95 %)
- «Mineral Processing» (93 %).

By region, the highest graduate employment rates were observed in Almaty Region (90%), East Kazakhstan Region (86%), and Kostanay and North Kazakhstan Regions (84% each). The average job search period among graduates was 3.3 months.

The ranking assesses the extent to which educational programs ensure graduates' employment and successful career trajectories, meet employers' expectations and labor market requirements, and adequately reflect current industry standards. Thus, the Ranking becomes an important feedback tool for universities from the labor market, identifying areas that require further development, as well as a reference point for prospective students, helping them evaluate the real value of the education they receive.

Analysis of the Register of Educational Programs

The total number of educational programs registered in the Register across all levels of higher education is about **8 467**,

including bachelor's, master's, doctoral, and residency programs. More than **60 %** of the registered programs have undergone accreditation. This demonstrates the commitment of higher education institutions to improving quality

and striving to comply with both national and international standards by undergoing both internal and external evaluation.

The distribution of educational programs by level reflects the structural priorities of the system of workforce training. The main share traditionally falls on bachelor's programs, which account for more than half of all programs and remain the fundamental stage of higher education, ensuring mass access and basic professional training. Master's programs hold the second position – **34.1%** of programs, while doctoral programs account for **about 10%.** Residency programs, concentrated in the field of healthcare, represent a key stage of professional development for physicians and constitute **5.2%** of the total number of programs (Figure 2.1.1).

The largest number of programs is concentrated in the following fields: Pedagogical Sciences (22.07% of all programs), Business, Management and Law (18.4%), and Engineering, Manufacturing and Construction (17.6%). Together, these three fields account for almost 60% of all educational programs, reflecting the sustained demand for pedagogical, technical, and managerial professions.

The remaining fields are distributed as follows →

The field of Arts and Humanities includes **823 educational programs**, representing 9.72% of the total.

In Healthcare, there are **696 programs** (8.2%), with about 63% of them offered in residency format.

Information and Communication Technologies are represented by **512 programs** (6.05%),

while Natural Sciences, Mathematics, and Statistics comprise **525 programs** (6.05%).

Educational programs in the Services field total **351** (4.15%)

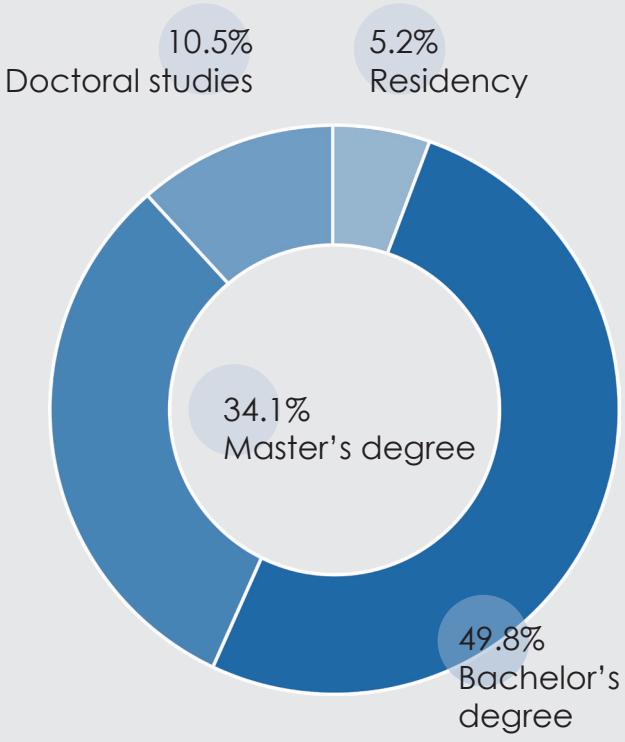
Social Sciences, Journalism, and Information account for **332 programs** (3.92%)

Agriculture and Bioresources account for **212 programs** (2.5%)

while Veterinary Science covers only **47 programs** (0.56%)

6 programs 0.1% in the fields of national security and military affairs

Figure 2.1.1.
Distribution of Educational Programs by Levels of Education



In this field, training is provided by 4 universities in the specialization "Public Security": at the bachelor's level – 5 programs implemented by universities such as

- **1 EP** Alikhan Bokeikhan University,
- **1 EP** Al-Farabi Kazakh National University,
- **2 EP** D.A. Kunaev Eurasian Law Academy,
- **1 EP** West Kazakhstan Innovative-Technological University;

master's leve (1EP) (7M12301 Law Enforcement, Al-Farabi Kazakh National University).

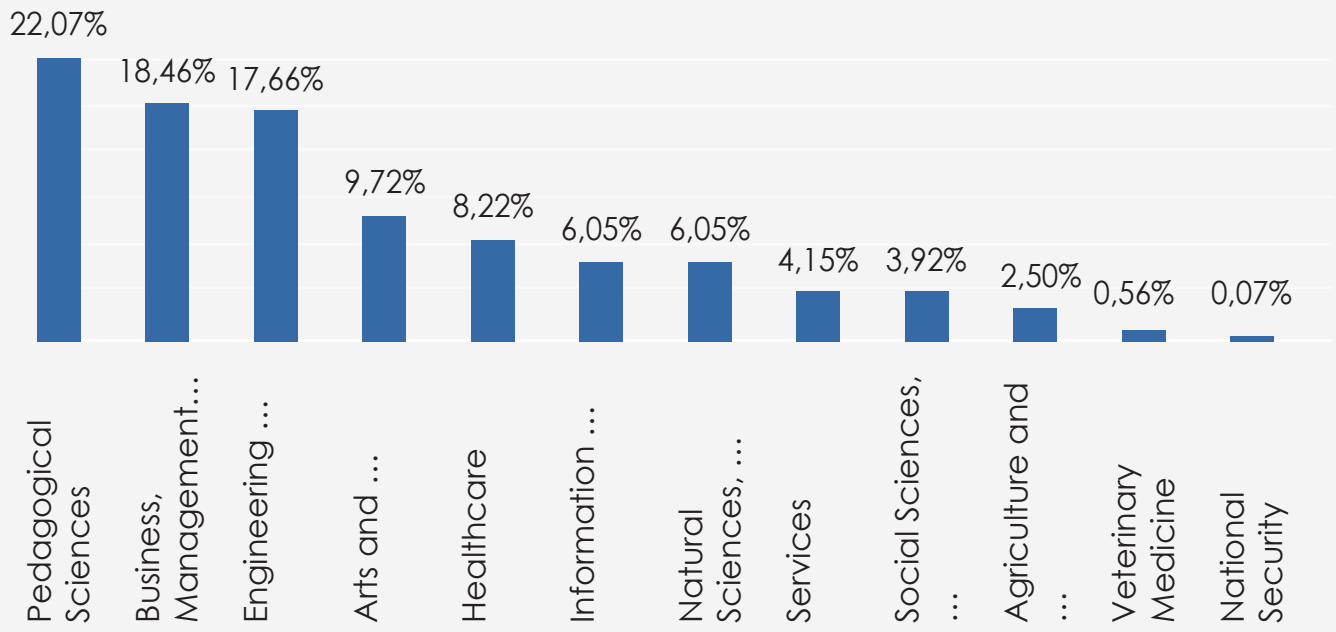
Thus, there is a clear concentration of programs in the humanities-pedagogical, engineering-technical, and managerial blocks (Figure 2.1.2.).

Within the structure of **master's** degree programs, three fields of study clearly dominate. The leading field is Business, Management and Law, accounting for **25.3%** of all master's programs. The second largest field is Engineering, Manufacturing and Construction (**18.2%**), followed by Pedagogical Sciences (**18.1%)**. This structure highlights the steady demand for managerial and technical competencies, combined with the continuing priority of training teachers at the level of advanced professional education.

In **doctoral** studies, the top three fields are as follows: Engineering, Manufacturing and Construction leads with **26.4%** of all programs, followed by Business, Management and Law (**16.1%**), and Pedagogical Sciences (**15.7%**). This reflects a strategic focus on developing the country's scientific and technological potential and strengthening the research component in management and education. Doctoral studies therefore demonstrate specialization in areas linked to knowledge-intensive growth, modernization of management, and the reproduction of the academic corps (Figure 2.1.3.).

The top ten universities by the number of implemented educational programs are

Figure 2.1.2.
Distribution of Educational Programs by Fields of Study



presented below (Table 2.1.2)

About 8% of educational programs can be classified as innovative–they are characterized by an interdisciplinary approach, a focus on advanced technologies, and the active introduction of new forms of learning organization, including digital platforms, project-based learning, and industry collaboration. The largest share of innovative programs has been developed in the field of **Engineering, Manufacturing and Construction** (22.75%).

The universities implementing the greatest number of innovative programs include:

M. Auezov South Kazakhstan University **28 EP**	A. Saginov Karaganda Technical University **17 EP**
A. Margulan Pavlodar Pedagogical University **17 EP**	Toraighyrov University **17 EP**
L.N. Gumilyov Eurasian National University **43 EP**	K.I. Satpayev Kazakh National Research Technical University **41 EP**
Al-Farabi Kazakh National University **12 EP**	M. Kozybayev North Kazakhstan University **11 EP**

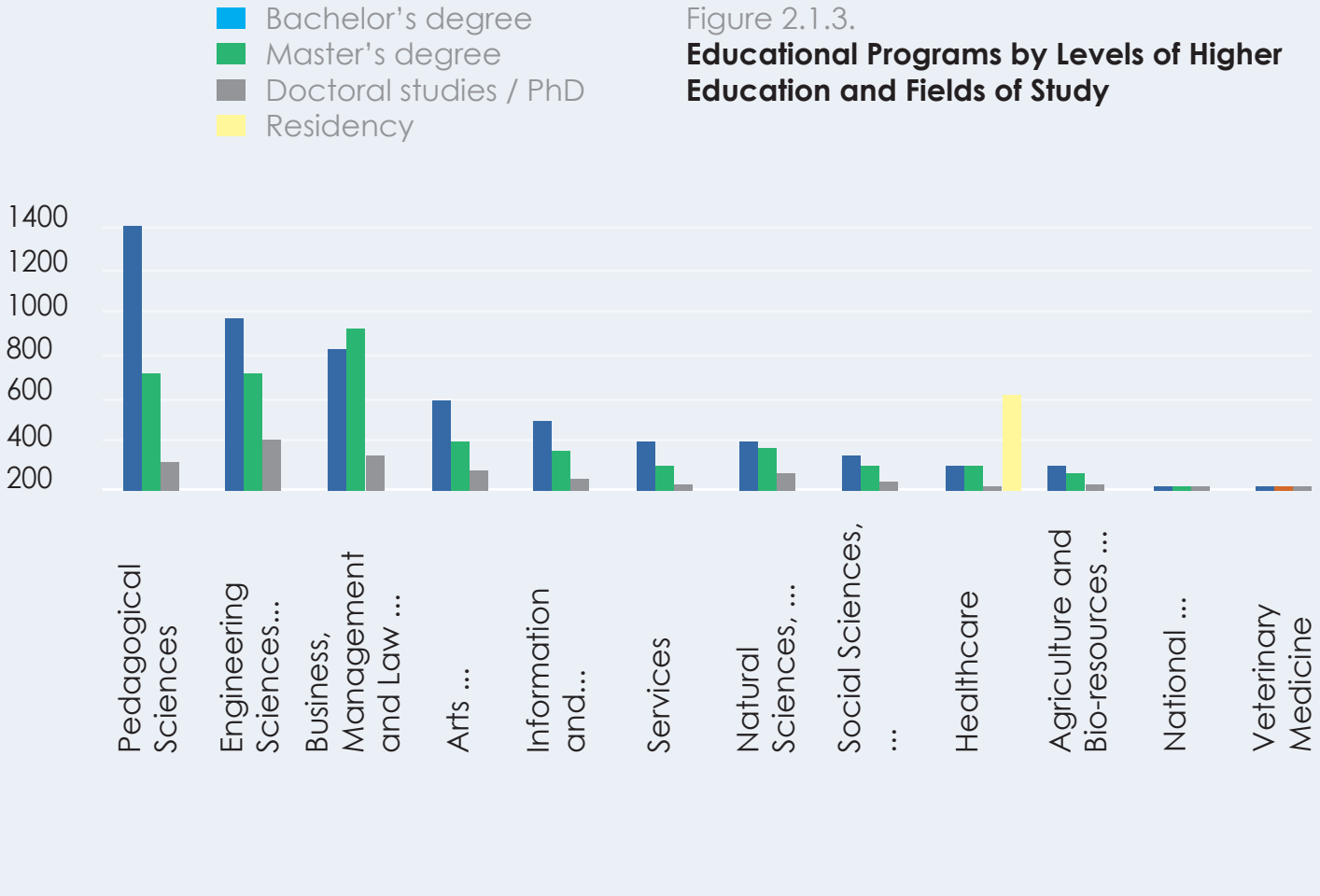


Figure 2.1.3.
Educational Programs by Levels of Higher Education and Fields of Study

The development of innovative educational programs in Kazakhstan is dynamic and system-oriented, relying on a strategic link with professional standards. Of the 8,500 programs implemented in the higher education system, about 85% have been designed on the basis of professional standards, indicating a high degree of alignment between educational content and the requirements of the real sector of the economy. Notably, 17.65% of all innovative programs were also developed in line with updated professional standards. This highlights not only the growing importance of competency standardization but also the establishment of a sustainable mechanism for integrating innovation into training programs that prepare graduates to adapt to the changing conditions of technological and socio-economic development.

The development and implementation of innovative educational programs is becoming a strategic priority for Kazakhstan's higher education system in the context of rapid digitalization of the economy, the transition to a competency-based training model, and the global increase in demands on human capital. Innovative programs enable universities to adapt promptly to labor market changes, integrate research outcomes into the educational process, and prepare specialists in interdisciplinary fields with high employment potential.

The need for such programs arises from the fact that traditional educational pathways often fail to reflect current industry demands, while accelerating technological transformation requires the formation of new competencies–in artificial intelligence, sustainable development, digital engineering, biotechnology, and other areas. Kazakhstani universities have already begun developing pilot innovative programs in such fields as quantum engineering, digital agriculture, genomics, and AI in healthcare. These initiatives are based on the principles of academic freedom, compliance with state educational standards (SCSE), alignment with the National Qualifications System, and professional standards.

Innovative programs also feature flexible modular structures, practice-oriented approaches, international cooperation, and active involvement of industry partners. Their advancement requires not only substantive transformation but also

Table 2.1.2.
Top 10 Higher Education Institutions by Number of Educational Programs

Higher Education Institution (HEI)	Number of EPs
Al-Farabi Kazakh National University	571
L.N. Gumilyov Eurasian National University	301
M. Auezov South Kazakhstan University	300
Abai Kazakh National Pedagogical University	256
K.Satpayev Kazakh National Research Technical University	240
Toraighyrov University	193
A. Buketov Karaganda University	186
Akhmet Yassawi International Kazakh-Turkish University	171
M.Kh. Dulaty Taraz University	152
Sarsen Amanzholov East Kazakhstan University	148

institutional support–human, financial, and regulatory. Thus, innovative programs are becoming a key instrument in shaping a new type of university, capable of integrating education, science, and the economy into a unified strategy for sustainable development.

The project "My Profession – My Future", implemented within the framework of the Program for Increasing Population Incomes until 2029, is aimed at the deep transformation of the workforce training system, taking into account current and forecasted labor market needs. It ensures proactive staffing for key sectors of the economy and supports the sustainable development of regions.

Within the **"My Profession – My Future"** project, two key analytical tools have been distinguished–regional and sectoral Atlases of New Professions and Skills–each serving its own function in the transformation of the workforce training system. Regional atlases are developed at the level of regions and cities of national significance and reflect local economic features, priority sectors, investment projects, and projected changes in the employment structure. They are designed for practical use by universities and colleges in designing educational programs tailored to the real demands of regional labor markets.

In nine regions of the country, including Pavlodar, Mangystau, Karaganda, Akmola, Aktobe, Zhambyl, and Zhetysu regions, as well as the cities of Astana and Almaty, regional Atlases of New Professions and Skills have been developed. These maps have become the basis for modernizing educational programs.

For example, under the "My Profession – My Future" initiative, more than 900 educational programs have been updated by universities based on regional needs maps, including over 500 new programs introduced by 90 universities.

Regional atlases are developed in line with the economic specialization of each region, reflecting its priority industries.

For instance, in Pavlodar Region the focus is on **energy** and **metallurgy**; in Zhambyl Region–on the **agro-industrial complex** and **chemistry**; and in the western regions–on **oil and gas as well** as **transport** and **logistics**.

At Toraighyrov University (Pavlodar Region), key programs have been launched:

- **«6B07151 Mechanical Engineering and Reverse Engineering»**
- **«6B07141 Industrial Robotics and Automatio»**,

based on the regional Atlas of Professions. These programs were developed in partnership with the leading industrial enterprise Prommashkomplekt LLP and are aimed at training specialists for Industry 4.0, including experts in digital modeling, industrial robotics, and intelligent production automation.

▼

1. Industrial Robotics and Automation

program trains, in particular, engineers in robotic systems management, process automation specialists, and engineers in non-destructive testing, in line with the transformation of the mechanical engineering and energy industries.

2. Mechanical Engineering and Reverse Engineering

program prepares engineers in prototyping, CNC machine operators, and 3D model designers.

Curricula for these programs include disciplines aligned with technological trends such as digital twins, 3D printing, engineering calculations in CAD environments, and production automation.

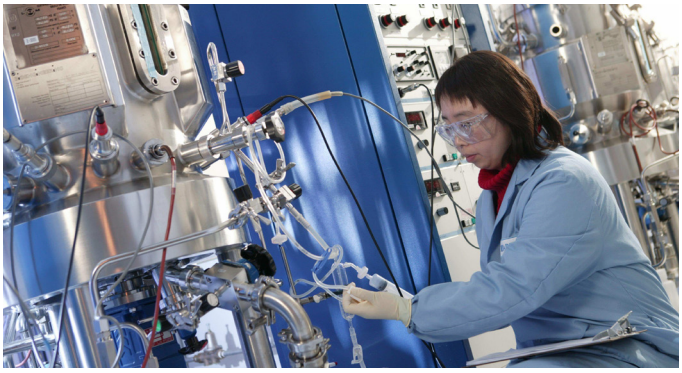
At Taraz **Regional University**, the program ▼

Digital Agronomist, Specialist in New Agricultural Technologies

has been developed, incorporating modules on precision farming, agro-GIS, and the use of drones in crop production.

At the **International Taraz Innovation Institute named after Sherkhan Murtaza**, the ▼

program "6B05301 Chemistry" was created, aimed at training specialists in updated professions identified in the Atlas – "Chemical Technologist for Coal Processing" and "Chemical Laboratory Specialist for New Materials Development."



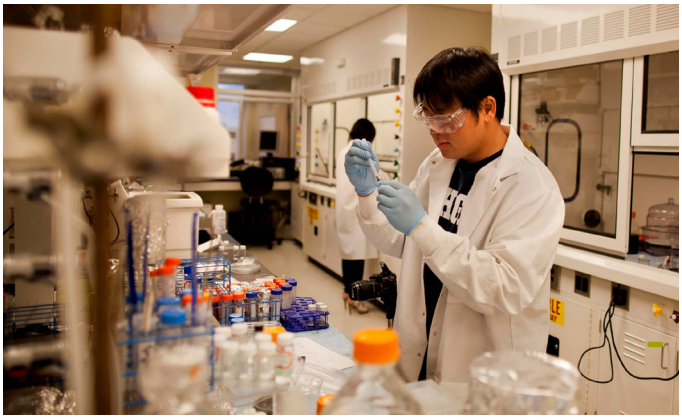
Aktobe Regional University named after K. Zhubanov, in partnership with the British **Heriot-Watt University,** developed a joint program

Petroleum Engineering and Energy Management (KZ+UK)

designed to prepare a new generation of specialists for the sustainable development of the oil and gas industry. The program includes professions such as "Eco-Analyst in Extractive Industries" and "Engineer-Analyst in the Oil and Gas Sector," with a strong focus on reducing environmental impact, while building competencies in predictive analytics and digital management of production processes.

Yessenov University (Caspian University of Technology and Engineering named after Sh. Yessenov) has introduced the program

Chemical Technology of Organic Substances



within the Atlas profession "Chemical Engineering Technologist." The program targets the digitalization of the oil and gas sector and covers areas such as digital engineering and production process automation. Its curriculum is designed with foresight of the key development vectors of the petrochemical industry, including the improvement of deep oil refining processes, the rational use of residual petroleum products, the enhancement of environmental characteristics of production, and increased economic efficiency.

In 2024, monitoring was conducted of active educational programs developed on the basis of sectoral and regional Atlases of New Professions and Skills and included in the national Register. The total number of such programs amounted to 510 out of 8,424 educational programs. The largest number of Atlas-based programs was recorded in Almaty (188 programs), followed by East Kazakhstan Region and the city of Shymkent (Table 2.1.3.).

Among the universities that have developed the largest number of educational programs based on sectoral and regional Atlases of New Professions and Skills, the leaders are:

- K.I. Satpayev Kazakh National Research Technical University (Almaty),
- D. Serikbayev East Kazakhstan Technical University (East Kazakhstan Region),
- Toraighyrov University (Pavlodar Region),
- M. Auezov South Kazakhstan University (Shymkent),
- L.N. Gumilyov Eurasian National University (Astana),

Table 2.1.3.
Number of Atlas-Based Educational Programs by Region

Region	Number of EP
Almaty city	188
East Kazakhstan Region	80
Shymkent city	42
Pavlodar Region	35
Astana city	31
Abai Region	14
Zhambyl Region	32
Karaganda Region	12
Turkistan Region	10
Akmola Region	8
Mangystau Region	8
Aktobe Region	18
Kostanay Region	8
Zhetysu Region	5
Kyzylorda Region	8
North Kazakhstan Region	4
Almaty Region	0
Atyrau Region	0
West Kazakhstan Region	7
Ulytau Region	0
Итого	510

- Sh. Yessenov Caspian University of Technology and Engineering (Mangystau Region),
- S. Utebayev Atyrau University of Oil and Gas (Atyrau Region),
- K. Zhubanov Aktobe Regional University (Aktobe Region).

Sectoral Atlases, in turn, cover specific sectors of the economy nationwide and focus on long-term trends such as digitalization, automation, the introduction of environmentally sustainable technologies, and the emergence of new professions. Sectoral Atlases serve as a methodological benchmark for national strategies and professional standards, identifying the transformations occurring within professions and the new competencies becoming key under technological shifts. Unlike regional Atlases, sectoral ones do not describe labor demand in a specific territory but instead provide a unified vision of the future of professions across the country.

Thus, regional and sectoral Atlases are complementary tools that make it possible to simultaneously take into account the specifics of the local economy and ensure the strategic alignment of the education system with national development priorities.

Within the framework of the Atlases, the largest number of educational programs has been developed in the following sectors:

Information Technology and Digitalization – more than 170 EP have been developed.

This category includes programs in Data Engineering, UX/UI Design, Internet of Things, Cybersecurity, as well as Digital Marketing and Big Data Analytics. Active contributors to the development include the International Information Technology University (IITU), Kazakh-British Technical University (KBTU), Satbayev University, and Al-Farabi Kazakh National University.

Industrial Sector and Engineering about 160 programs

have been developed, including Mining Automation, Digital Metallurgy, Mechanical Engineering with Predictive Analytics, Smart Logistics, and Technosphere Safety. These programs were introduced at Karaganda Technical University, Toraighyrov University in Pavlodar, and Zhezkazgan University..

Agro-Industrial Complex – about 140 programs

have been developed, including Precision Farming, Agro-Biotechnologies, Digital Livestock Farming, GIS in Agriculture, and Drone-Based Monitoring. Development was carried out by S. Seifullin Kazakh Agrotechnical University, I. Zhansugurov Zhetysu University, Taraz Regional University, and other agricultural universities.

Healthcare and Biotechnology – around 120 programs

have been developed, including Digital Medicine, Bioinformatics, Personalized Medicine, and Genomic Technologies. New programs were introduced at S.D. Asfendiyarov Kazakh National Medical University, South Kazakhstan Medical Academy, and Semey Medical University.

Energy and Eco-Technologies – about 80 programs

have been developed, covering areas such as Wind Energy, Microgrid Management, Carbon Accounting, Energy-Efficient Construction, and Environmental Certification. These programs were implemented at technical universities in Pavlodar, Karaganda, and Aktau.

Architecture and Urban Studies – more than 50 programs have been developed, focusing on Smart Cities, BIM Modeling, Urban Infrastructure Management, and Sustainable Design.

In addition, programs were also developed in other promising sectors–financial technologies, green chemistry, digital education, human resource management in the digital economy, supply chain logistics, and others. In some cases, the new and modernized educational programs included up to 90% adapted content, made possible through the direct involvement of business representatives, industry associations, technology parks, and other stakeholders.

The universities that actively participated in the development of programs not only modernized curricula but also strengthened the practice-oriented nature of content, introduced project-based learning formats, soft skills modules, and modern digital competencies. Thus, the project **"My Profession – My Future"** has acted as a driver for building a flexible, competitive, and regionally responsive higher education system, ensuring the training of specialists capable of working in high-tech and transforming sectors of the economy.

In this way, the Atlas of New Professions has become not only a forecasting tool but also a practical foundation for designing innovative educational programs directly embedded in the context of regional development, digital transformation, and workforce modernization of the economy.

2.2. Teacher Training in the Context of Modernizing the Kazakhstani Higher Education System

Currently, **54 universities in Kazakhstan** hold licenses for teacher training, and the requirements for applicants to these programs continue to increase. Since 2021, the passing score for pedagogical programs has risen from 50 to 75, highlighting the effort to improve the quality of entrants.

180,210 people	of whom 53,780 (29.8%) are studying under a state grant

Bachelor's degree	Master's degree	Doctoral studies
166 565 students	**12 811** students	**834** students

For comparison, in the 2021-2022 academic year, **177,519** students were enrolled in pedagogical programs, with **46,513** (26.2%) of them on a state grant.

There is also a noticeable positive trend among talented young people who are choosing pedagogical fields. In 2024, grants were awarded to **1,797** holders of the "Altyn Belgi" special academic achievement award, which is **269** more than in 2023, when grants were given to **1,528** of these outstanding students.

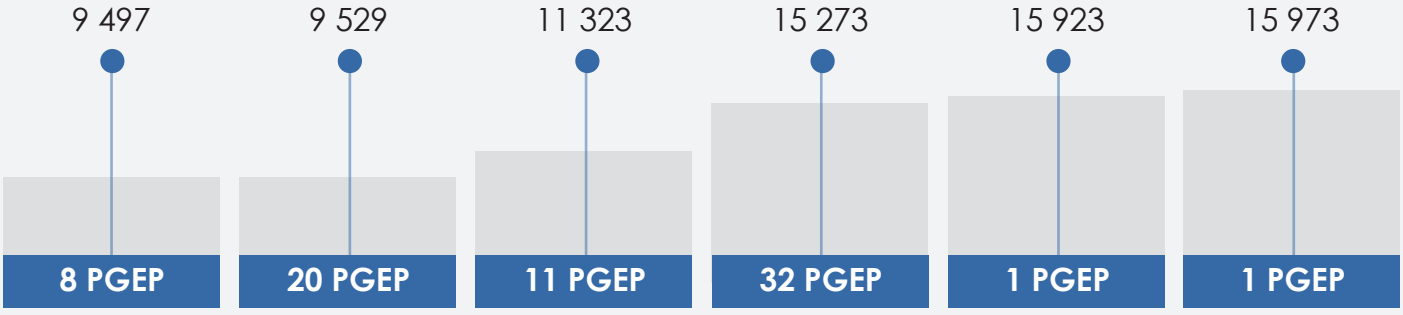
This year, the average Unified National Testing (UNT) score among applicants to pedagogical programs was **105**, which is higher than last year's score of **102.5.** Over the past three years, **142,049 people** have graduated from these programs, and 72.4% (or **102,914 people**) have successfully found employment.

The number of state educational grants for pedagogical specialties increases annually. For example, in the 2019-2020 academic year, 9,497 grants were allocated; in 2020-2021, the number was 9,529; and in 2021-2022, it was 11,323. In the 2022-2023 academic year, the number of grants rose to 15,273, in 2023-2024 to 15,923, and in the current 2024-2025 academic year, it reached 15,973 (Figure 2.2.1.).

The progress demonstrates the government's commitment to prioritizing teacher preparation.

Kazakhstan's pedagogical universities

Figure 2.2.1. **Trend of Increasing Educational Grants ↓**



continue to actively modernize their educational programs. At present, 1,725 educational programs are registered in the National Registry, 89.7% of which have been updated in line with the professional standard 'Teacher' [21]. These changes are aimed at improving the training of future teachers, meeting modern requirements, and raising the qualification level of graduates.

Kazakhstan has also adopted a new accreditation standard for pedagogical universities, which sets higher requirements for the quality of the educational process and the enhancement of faculty professional competencies. This standard is designed to strengthen oversight of teacher training, thereby contributing to improved education quality and aligning programs with current professional standards.

The introduction of the new accreditation standard requires universities to undergo both institutional and specialized accreditation, which will enable more effective monitoring of the quality of teacher education and training.

The reform of the teacher education system is a strategic priority for the Republic of Kazakhstan, aimed at improving the quality of secondary education through the preparation of highly qualified teachers. Efforts to enhance the quality of teacher education are being carried out within the framework of the World Bank project 'Modernization of Secondary Education.'

The project has demonstrated significant results, having achieved or exceeded most of its targets, which reflects a systemic approach to reform. Key achievements under the project, following its transfer to the Ministry of Science and Higher Education (MSHE) and its reorientation towards teacher education, include:

Updating educational programs:

- Updating educational programs: 30 new subject-oriented bachelor's and master's degree programs have been developed and piloted. These programs were created with the participation of 17 Kazakhstani universities, the Graduate School of Education at Nazarbayev University, and 2 Finnish universities. All 30 programs have been included in the National Registry of Educational Programs. In the 2023–2024 academic year, these programs underwent pilot implementation, and starting from September 1, 2024, their full-scale rollout began across pedagogical universities [22].
- Innovative features of the programs: These programs place a strong emphasis on the development of research skills, the digitalization of education and digital competencies of teachers, as well as on the renewal of inclusive pedagogy, incorporating lifelong learning methods.

The programs, along with 103 newly developed and piloted specialized courses, are fully aligned with the updated content of secondary education, ensuring continuity and high quality in the training of future teachers.

In an effort to upgrade the skills of faculty, a project trained 50 university-

level trainers on how to design and scale educational programs. From January to May 2024, 1,800 faculty members from universities offering pedagogical programs completed training. This training included developing syllabi for the pedagogical components of 30 educational programs, as well as new courses on topics such as: teaching methods for rural and small schools, the green economy, and others.

In addition, 100 faculty members from the natural sciences and mathematics fields received training on teaching their subjects in English using the CLIL (Content and Language Integrated Learning) methodology. From January to May 2024, **200** university faculty members and **50** principals of rural schools were also trained as "leaders of change" in education.

Furthermore, a model for inclusive education was developed. Based on this new model, training was provided to university faculty (**250** participants) and to specialists and teachers from public general education and specialized schools (**250** participants), including rural schools (**200** participants). This group included special needs teachers, speech therapists, psychologists, and subject teachers.

Systemic changes and standardization:

Full alignment has been achieved between the requirements for textbook evaluation,

the **Unified National Test** (UNT), and teacher education with the updated curriculum content. A total of 6,273 test items have been developed and approved for the UNT.

Infrastructure development:

The renewal of the material and technical base has become an important component of the project. To date, 25 universities have been equipped with subject-specific classrooms for the methodology of teaching physics, chemistry, and biology in line with the requirements of a modern learning environment, and 14 universities have been provided with classrooms for inclusive education.

Implementation of a new teacher education model:

Seventeen universities have successfully introduced mechanisms for planning effective teacher education supported by appropriate resources and models. This work has laid the foundation for scaling up the new teacher preparation model nationwide.

In sum, the project has not only contributed to improving the quality of education but has also created the basis for a broader reform agenda aimed at raising overall teaching standards. Initiatives implemented under the project - such as raising admission requirements for pedagogical universities and developing alternative pathways into the teaching profession–are having a sustainable long-term impact on teaching quality.

In 2022, the Republican Educational and Methodological Council under the Ministry of Science and Higher Education adopted the Concept for the Modernization of Teacher Education. Taking into account the results achieved and the emerging challenges in education, the document was updated in 2024 and renamed the **Concept for the Development of Teacher Education in the Republic of Kazakhstan** [23].

The updated Concept outlines nine priority areas: →	**Forecasting the demand for teaching staff and the use of advanced digital technologies**
Establishing a unified university educational space with an innovation focus	**Promoting an inclusive approach in education**
Practice-oriented professional training	**Enhancing continuous teaching practice**
Developing a research component within the teacher's professional profile	**Building general and specialized digital competencies of teachers**
Strengthening teachers' leadership skills and managerial competencies	**Introducing innovations in the system of continuous teacher education**

At the same time, the content and methods of teacher training in universities will be oriented toward shaping the personality of the teacher as a leader–equipped with research, professional, digital, and managerial competencies; advanced soft skills; expertise in inclusive and project-based education; and the capacity for continuous professional development.

In the context of the transformation of Kazakhstan's education system and the active implementation of the principles of inclusivity, the preparation of specialists in special pedagogy and educational diagnostics is becoming increasingly important. The growing number of children with special educational needs–including those with autism spectrum disorders (ASD), as well as speech, hearing, vision, and intellectual impairments–requires teachers to acquire new professional competencies and approaches.

According to WHO, one in 160 people is affected by autism, and this number continues to grow every year. In Kazakhstan, too, the number of children diagnosed with autism spectrum disorders is on the rise. As of early 2024, more than 9,000 individuals with this diagnosis were officially registered in the country [24].

In the context of Kazakhstan, this implies the need to establish a system for high-quality teacher preparation that equips specialists to work in an interdisciplinary environment, apply modern methods of pedagogical diagnostics and support, and adapt the educational process accordingly.

In the 2024–2025 academic year,

Bachelor's degree ↓

4,190 students, of whom **1,828** are studying under the state educational order.	Graduates: **1,398**, of whom **242** completed their studies under the state educational order.

Master's degree↓

308 students are enrolled in the master's program, of whom 267 are studying under the state funding.	Graduates: 1,398, including 162 master's students (134 under state order).

Doctoral studies↓

36 people are enrolled in this educational program at the doctoral level.	

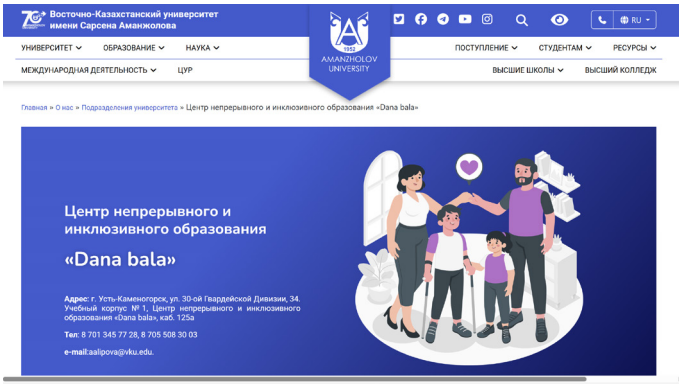
As of 2024, at least 40 bachelor's, master's, and doctoral programs in the field of special pedagogy have been registered in the national registry. These programs are implemented across most regional universities of the country, including:

- Abai Kazakh National Pedagogical University,
- Kazakh National Women's Pedagogical University,
- S. Amanzholov East Kazakhstan University,
- Margulan Pavlodar Pedagogical University,
- O. Zhanibekov South Kazakhstan Pedagogical University, and others.

Particular attention should be given to innovative educational programs focused on supporting children with autism spectrum disorders (ASD):

- **Master's level:** 7M01902 and 7M01908 — Support for children with ASD (offered at Abai KazNPU, Kazakh National Women's Pedagogical University, S. Amanzholov EKU)
- **Bachelor's level:** 6B01907, 6B01902 (IP) – Support and diagnostics for children with ASD (offered at A. Baitursynuly Kostanay Regional University, Margulan University, Zhanibekov University, Dulaty University, S. Amanzholov EKU, Atyrau University, Abai KazNPU)
- **Specialized fields of study:** 7M01902: Speech Therapy, 6B01903: Oligophrenopedagogy, 6B01904: Typhlopedagogy, 6B01901: Surdopedagogy.
- **In addition, a doctoral program has been registered:** 6B01901 "Special Pedagogy" (Abai KazNPU).

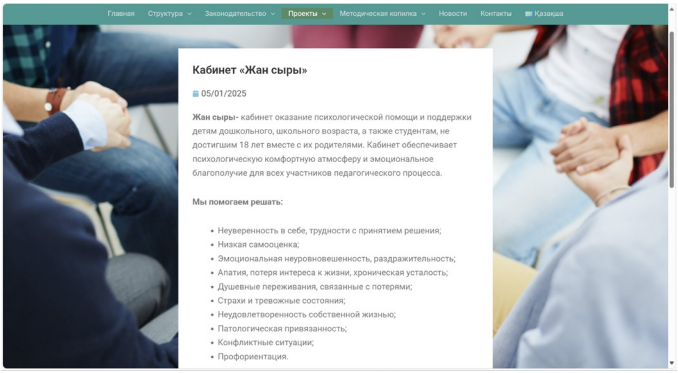
A vivid example of a practice-oriented approach to training specialists in special pedagogy is the experience of S. Amanzholov East Kazakhstan University.



A key element of the training process is the Center for Continuous and Inclusive Education 'DanaBala', which houses specialized laboratories such as sensory integration, speech therapy, psychocorrection, STEAM, and others. These laboratories are equipped with modern devices (speech therapy simulators, audiometry systems, Tomatis, EEG, SPPS, etc.) and serve as a base for practical classes, training sessions, and scientific research.

At Sh. Yessenov Caspian University of Technology and Engineering , a holistic approach is applied to the preparation of teaching staff for work in inclusive educational settings. Specialized classrooms for inclusive education, equipped with modern tools, are used for students' practical sessions and independent work in the field of Special Pedagogy.

The inclusive center 'Zhan Syry' also operates actively, providing individual and group counseling, training programs, seminars, and expert consultations.



The university aligns its training with changes in the regional Atlas of Professions and prepares future specialists for a new role–that of Coordinator of Inclusive Education–by equipping students with practical competencies in demand on the labor market.

Despite the active development of teacher training, including the introduction of an inclusive component, one systemic challenge remains–the absence of a coherent and conceptually framed national pedagogy. At present, it is represented mainly in the form of fragmented disciplines, elective courses, or isolated research studies, but does not yet function as a unified philosophy and methodological foundation of the education system. As a result, the historical, cultural, value-based, and worldview characteristics of the Kazakh people and the multiethnic society are insufficiently reflected in educational programs. This weakens the educational mission of schools and undermines the resilience of national identity in the context of a globalizing world.

The absence of a coherent national pedagogy as a methodological foundation of the education system leads to several deep-rooted problems.

1. First, Kazakhstani pedagogy demonstrates a weak identity against the backdrop of dominant globalized educational trends, which complicates the formation of a stable value system among the younger generation.
2. Second, there is no systematized body of knowledge, technologies, and educational methods rooted in the rich heritage and traditions of the Kazakh people.
3. Third, ethnopedagogical approaches are poorly integrated into teacher training programs, limiting their ability to transmit nationally oriented models of education.
4. Fourth, there is a low level of intergenerational transmission of traditional educational practices, leading to a gradual gap between historical experience and contemporary educational realities.

At the same time, Kazakhstan is undertaking systemic measures to renew and develop teacher education. The quality of incoming students is improving; new professional standards are being introduced; and educational programs are being updated with an emphasis on inclusivity, digital skills, and practice-oriented training. The training of specialists in special pedagogy, including the support

of children with special educational needs, is actively expanding. Universities are increasingly engaged in international initiatives, modern infrastructure is being developed, and collaboration with employers is being strengthened.

Together, these measures create the conditions for shaping a professionally competent, ethically responsible, and socially oriented teaching workforce, capable of working effectively amid the ongoing transformation of Kazakhstan's education system.

В ВКУ имени С.Аманжолова состоялся семинар для директоров школ областного центра на тему: **Управление образовательным процессом в условиях инклюзивного образования: Современные подходы и опыт**

Восточно-Казахстанский университет им. С.Аманжолова. **Центр непрерывного и инклюзивного образования «Dana bala»**

2.3. Competencies of Engineers of the Future: Alignment of Training Programs with Labor Market Requirements

Engineering education today is acquiring strategic importance, going beyond individual disciplines and national borders. It is becoming a key factor in addressing global challenges–from climate change and energy crises to the technological transformation of industry. Engineers not only create production and digital infrastructure but also play a central role in sustainable development, process automation, the advancement of artificial intelligence, and green technologies. In this context, the President of Kazakhstan emphasizes the need to reorient education toward technical professions and to create a new generation of industrial engineers, including through mechanisms such as the industrial PhD program in partnership with manufacturing companies.

In accordance with the President's instructions, priority attention is given to the training of specialists in technical fields. Engineering training is carried out by 61 universities. In 2024, more than 60% of the total volume of the state educational order was allocated to the training of engineering and technical personnel.

Engineering educational programs are implemented within the following higher education field:

Engineering, Manufacturing, and Construction – covering five areas of training →

Architecture and Construction

Engineering and Engineering Sciences

Manufacturing and Processing Industries

Standardization and Metrology

Water Management

Information and Communication Technologies – including ICT, Telecommunications, and Information Security.

Separate engineering programs are also implemented in such fields as Natural Sciences and Agriculture, including

- **Land Management**
- **Water Resources**
- **Agroengineering**

In 2024, the following number of students were enrolled in these fields →

103 446 people, of whom↓

Bachelor's degree
97 679 students

Master's degree
4 741 students

Doctoral studies
1 026 students

The Register of EP includes 1,435 (17.5%) engineering programs, of which over 60% (870) have been updated →

Over 200 professional standards, including↓

Bachelor's degree
723 EP

Master's degree
525 EP

Doctoral studies
187 EP

Table 2.3.1.
Top 10 Universities by Number of Engineering Educational Programs

ОВПО	Количество ОП
K.I. Satpayev Kazakh National Research Technical University	145
M. Auezov South Kazakhstan University	111
Al-Farabi Kazakh National University	78
Abylkas Saginov Karaganda Technical University	63
Toraighyrov University	62
M.Kh. Dulaty Taraz Regional University	57
D. Serikbayev East Kazakhstan Technical University	49
L.N. Gumilyov Eurasian National University	46
Academy of Logistics and Transport	45
S. Seifullin Kazakh Agrotechnical Research University	45

The largest number of engineering educational programs is concentrated in the following universities (Table 2.3.1.)

Concept of Engineering Education

In 2024, the Concept of Engineering Education of the Republic of Kazakhstan for 2024–2029 was developed, aimed at the systemic transformation of approaches to training engineering personnel. The Concept focuses on a comprehensive rethinking of engineering education in response to current challenges that hinder the formation of a competitive engineering capacity in the country. These challenges manifest across four key levels.

1 at the international level, Kazakhstan's engineering education remains insufficiently integrated into global professional and accreditation communities. Kazakhstan is not represented in such international agreements as the Washington, Sydney, or Dublin Accords, and the national system of engineer certification does not yet meet international requirements. This limits the cross-border recognition of qualifications and participation in the development of global technological standards.

2 at the national level, there is an imbalance in the distribution

of educational resources and grants, declining youth interest in engineering specialties, weak preparation of applicants in the exact sciences, and a fragmented link between engineering education and the country's technological development priorities. Moreover, a gap persists between the needs of the economy and the content of educational programs, especially in the regions..

3 at the institutional level, the key challenges include outdated university infrastructure, weak interaction with industry, a limited number of faculty members with real-sector experience, and insufficient participation of universities in international projects and network partnerships. Altogether, these factors reduce the practice-orientation of training and slow down the adoption of advanced educational models.

4 at the level of educational programs, there remains a bias toward academic disciplines with insufficient focus on the development of instrumental and industrial competencies. Modern pedagogical technologies (such as project-based learning, case methods, and the CDIO approach) are underutilized, while the educational process is poorly adapted to the rapidly changing demands of industries and regions.

To overcome these challenges, the Concept proposes the formation of a sustainable and integrated system of engineering education aligned with the current needs of the economy, technological trends, and the objectives of sustainable development. The central goal of the document is to build an ecosystem of engineering education oriented toward integration with science and industry, the strengthening of human capital, and the provision of the country's long-term technological sovereignty. Special attention is given to the quality of graduate training, the substantive transformation of educational programs, the international comparability of qualifications, and the enhancement of linkages with the labor market.

To achieve this goal, a comprehensive set of tasks has been defined, including ensuring high-quality training of engineering personnel at the national level; developing a national model of engineering education aligned with the Sustainable Development Goals; integrating into curricula the principles of CDIO (Conceive–Design–Implement–Operate) and a General Basic Engineering Core Curriculum; establishing a coherent system of training through the tuning of educational programs across different levels of education; creating a National Council of Engineers as a coordinating body; as well as developing a regulatory framework and establishing professional certification centers to ensure the recognition of engineering qualifications.

The Concept of Engineering Education in the Republic of Kazakhstan provides for a transition to a **new model** of engineering training oriented toward the entire life cycle of engineering activity–from the design to the operation of complex systems, processes, and products. Unlike the current system (Figure 2.3.1.), based on the Bologna model (bachelor's–master's–doctoral programs), the new model represents an integrated three-level structure of **Pre-University – University – Post-University**, ensuring the continuous development of engineering competencies from the early stages of education (Figure 2.3.2.).

1 stage – **Pre-University** – is aimed at the early development of students' engineering abilities.

O It covers 13 years of study and includes preschool, primary, lower secondary, upper secondary, technical and vocational, as well as post-secondary education.

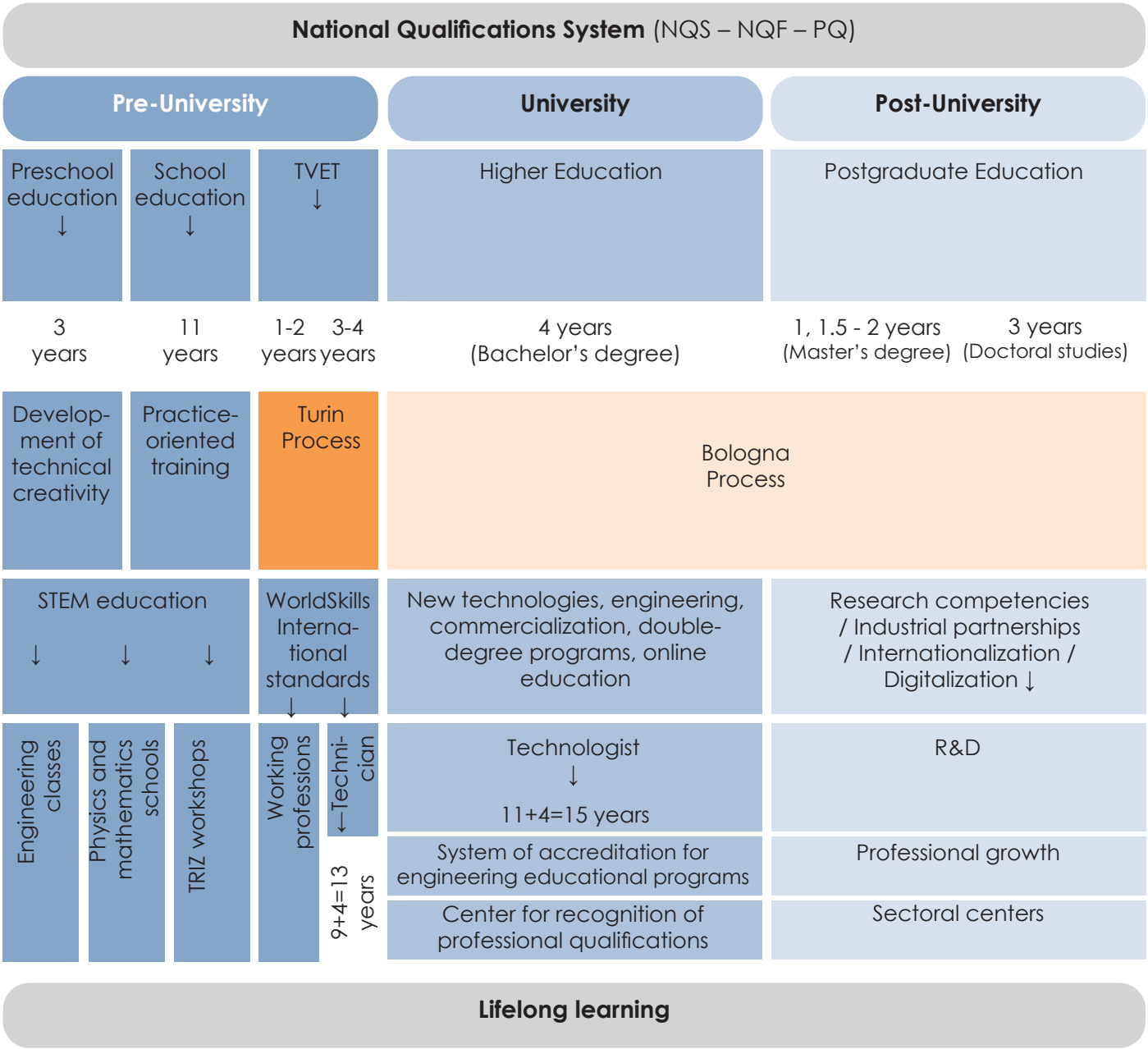
At this level, the provisions of the **Dublin Accord** (training of "technicians") are implemented, along with the CDIO framework in the parts of **Implement & Operate**. Training is built through a STEM approach, engineering classes, the "TRIZ Workshop" course, participation in **WorldSkills** competitions, and internships at enterprises, all of which provide a practice-oriented foundation for further study.

2 stage – University – engineering knowledge is deepened, and applied skills are developed.

This stage encompasses higher education and is oriented toward the preparation of "technologists." Here, the provisions of the **Sydney Accord** are implemented, together with the CDIO components (**Design, Implement, Operate)**. The central element is the **General Basic Engineering**

Figure 2.3.1.
Current model of engineering education in the Republic of Kazakhstan

Source:
Concept of Engineering Education of the Republic of Kazakhstan for 2024–2029



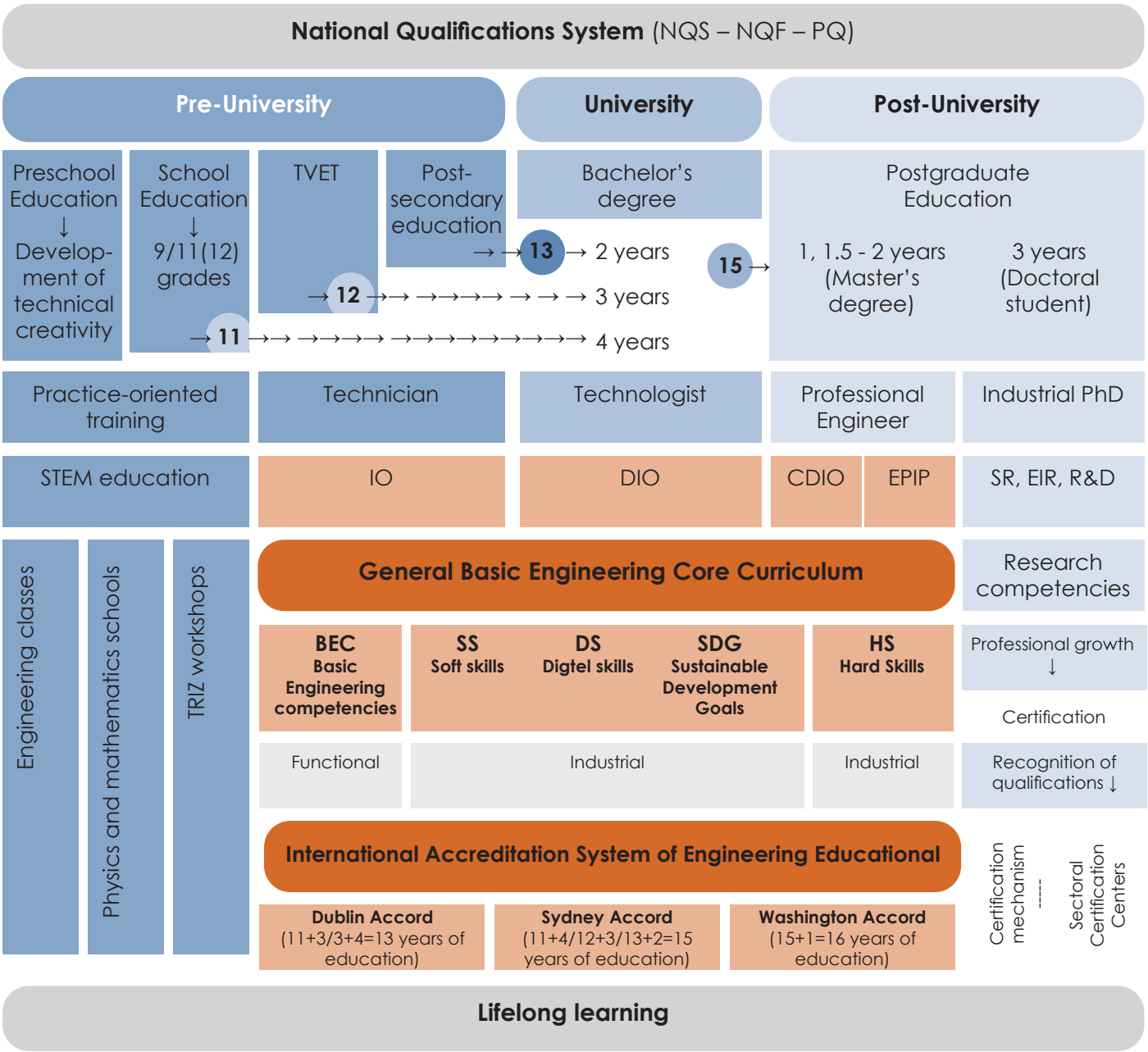
Core Curriculum, which includes disciplines such as applied mathematics, physics, engineering graphics, strength of materials, fundamentals of electrical engineering, and others.

An important component of the university stage is **micro-qualifications**, which allow students to acquire additional competencies in high-demand areas. This contributes to a rapid adaptation to labor market requirements, enhances the practice-orientation of training, and makes the learning process more flexible and personalized.

Moreover, micro-qualifications increase graduates' competitiveness by providing certification under **Levels 4–5 of the National Qualifications Framework** (NQF).

Figure 2.3.2.
New model of engineering education in the Republic of Kazakhstan

Source:
Concept of Engineering Education of the Republic of Kazakhstan for 2024–2029



3 stage – **Post-University** – ensures the training of professional engineers and researchers whose qualifications are recognized internationally.

The **professional master's degree** enables specialists to deepen practical engineering competencies in close connection with industry, while the **research and pedagogical master's degree** prepares future lecturers and researchers. **Doctoral studies** (including the Industrial PhD) provide scientific support for engineering activities and foster innovation, including genuine industrial integration. This stage corresponds to the **Washington Accord** and encompasses the full CDIO cycle – from concept to implementation and operation. Thus, the educational trajectory is completed, forming a seamless pathway for engineering training from initial career orientation to scientific and industrial leadership.

Accordingly, the new model of engineering education establishes a holistic, logically structured system aligned with international standards and practical applicability. It addresses contemporary technological challenges, ensuring the sustainable training of engineering personnel and creating a solid foundation for Kazakhstan's long-term technological development.

The implementation of the **Concept of Engineering Education** is carried out in stages in accordance with a systemic approach. The structure of engineering programs is being updated, with the introduction of the **General Basic Engineering Core Curriculum** providing unified training standards. One of the priority areas is the launch of the **Industrial PhD training model**, implemented in line with the instruction of the President of the Republic of Kazakhstan. On **September 1, 2024**, for the first time, the program for training Industrial PhD specialists was launched in cooperation with major industrial companies such as Kazzinc and Kazchrome.

For the training of industrial PhD students under the state educational order, 100 grants have been allocated. The program has been piloted since September 1, 2024, in seven universities of Kazakhstan: D. Serikbayev East Kazakhstan Technical University, K.I. Satpayev Kazakh National Research Technical University, A. Saginov Karaganda Technical University, A. Baitursynov Kostanay Regional University, Toraighyrov University, M. Kozybayev North Kazakhstan University, and S. Utebayev Atyrau University of Oil and Gas.

The new model of engineering education provides a mentorship mechanism for industrial PhD students, designed to ensure a close link with industrial practice. Dissertation supervision is carried out by at least two advisors, one of whom must be a highly qualified expert from the relevant industry. This approach to research supervision ensures not only academic depth but also the practical relevance of research projects.

Universities are actively working on updating the content of educational programs in line with professional standards and industry requirements, and innovative programs are being developed with a focus on integration with production and advanced technologies.

The largest number of innovative programs in the field of Engineering, Manufacturing and Construction are concentrated at **Satbayev University** (17 programs), **M. Auezov South Kazakhstan University** (11), **Toraighyrov University** (10), and **M. Kozybayev North Kazakhstan University** (7).

In total, 43 innovative programs have been developed based on the Atlas of New Professions in the sectors of Mechanical Engineering, Oil and Gas, Construction, Mining and Metallurgy, and Energy.

Innovative educational programs have been developed in the field of **oil** and **gas**

Горно-металлургический комплекс

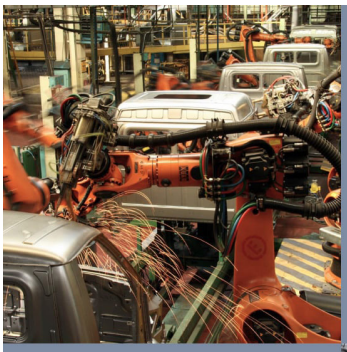
ATYRAU OIL AND GAS UNIVERSITY	- Predictive Analytics in the Oil and Gas Sector
D. Serikbayev EAST KAZAKHSTAN TECHNICAL UNIVERSITY	- Remote Sensing Methods Using Digital Technologies
Caspian University	- Digital Oil and Gas Engineering
KOZYBAYEV UNIVERSITY	- Robotic and Intelligent Systems and Instrumentation
ZHUBANOV UNIVERSITY	- Eco-Energy - Petrochemical Production Technology
AUEZOV UNIVERSITY 1943	- Geospatial Digital Engineering

The following innovative EP programs have been developed in the field of **energy**

Энергетика

AUEZOV UNIVERSITY 1943	- Integrated Intelligent Energy Systems - Digital Energy Systems: Generation, Distribution, and Consumption of Electricity
	- Geophysical Technologies and Engineering
	- Hydropower
	- Automation of Electric and Thermal Power Systems - Flight Dynamics and Control of Aircraft - Renewable Energy Sources
INTERNATIONAL UNIVERSITY	- Cyber-Physical Systems
	- High-Load Information Systems with Artificial Intelligence

Innovative EP have been developed in the field of mechanical **engineering**, taking into account regional needs.



Машиностроение

AUEZOV UNIVERSITY 1943	- 3D Modeling in Mechanical Engineering
SATBAYEV UNIVERSITY	- Digitalization of Mechanical Engineering Production
ABYLKAS SAGINOV KARAGANDA TECHNICAL UNIVERSITY STU 1953	- Digital Technologies in Mechanical Engineering
KOZYBAYEV UNIVERSITY	- Robotics, Intelligent Systems, and Instrumentation

The following innovative EP have been developed for the construction **industry**:

Строительство

	- "Urban Planning and Cadastre" and "Energy-Efficient Design of Buildings and Structures"
OUK Open University of Kyzylorda	- IT in Construction
D. Serikbayev EAST KAZAKHSTAN TECHNICAL UNIVERSITY	- BIM Technologies in Design

Overall, the implementation of the **Concept of Engineering Education** is aimed at a comprehensive modernization of the system of engineering training. This will ensure the international recognition of Kazakhstani engineering qualifications, enhance the quality of training through the adoption of modern educational approaches and standards, strengthen the link between education and industry, and establish a continuous system of engineering education.

As **pilot platforms** for testing the key mechanisms of the Concept, **Satpayev University and D. Serikbayev East Kazakhstan Technical University** have been designated. These institutions are expected to implement new models of engineering education based on international CDIO standards, practice-oriented training, and enhanced cooperation with industrial enterprises. The piloting process will make it possible to identify effective mechanisms for transforming engineering education, taking into account regional and sectoral specificities, and to develop replicable models for subsequent scaling across other technical universities of the country.

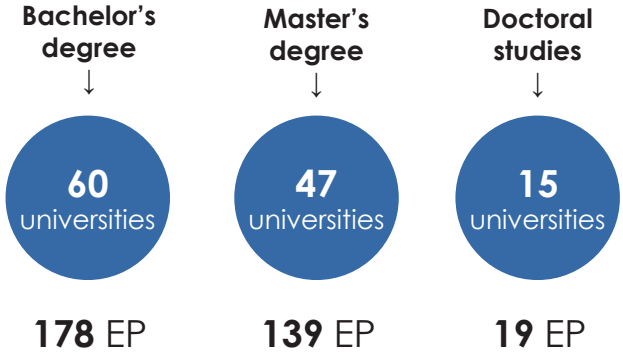
Thus, the pilot universities are becoming centers for shaping the new model of engineering education, ensuring alignment between policy, practice, and industrial needs. This will create the conditions for training competitive specialists in priority sectors of the economy and will strengthen Kazakhstan's position as an industry-oriented country capable of developing its own engineering schools and technological solutions.

2.4. Legal Education in Kazakhstan in the Context of International Quality Standards

In his Address to the People of Kazakhstan, "**Fair Kazakhstan: Rule of Law, Economic Growth, Public Optimism**", President Kassym-Jomart Tokayev placed particular emphasis on strengthening law and justice as cornerstone principles for building a sustainable and just society. Law and order are proclaimed not merely as instruments of governance, but as key societal values, without which neither economic growth nor social cohesion can be achieved. Their recognition as the foundation of state policy reflects a transition to a more mature model of social development based on the rule of law, equality of citizens before justice, and accountability of state institutions.

In this context, higher legal education acquires both symbolic and practical significance. The quality of lawyer training directly affects the implementation of the principles of justice, the protection of citizens' rights and freedoms, and public trust in legal institutions. Legal education thus serves as the foundation for preparing competent specialists capable of ensuring legality, public order, and the sustainable development of the rule of law.

As of 2024, 61 higher education institutions (49.6%) were engaged in training personnel in the field of Law, implementing 336 educational programs, including:



The largest number of programs is concentrated at →

25 programs
Al-Farabi Kazakh National University

13 programs
L.N. Gumilyov Eurasian National University

12 programs
E.A. Buketov Karaganda University

12 programs
Caspian Public University

12 programs
Kunaev University

10 programs
M.S. Narikbayev KAZGUU University (MNU)

10 programs
Narxoz University

In the system of legal education, innovative approaches are being applied, focused on modern requirements of legal practice and international standards. This is reflected in the development and implementation of new formats of educational programs that provide practice-oriented, interdisciplinary, and digital training of specialists.

The Register of Educational Programs includes 12 innovative programs, developed and implemented by 11 higher and postgraduate education institutions, confirming universities' commitment to updating the content of legal education and adapting it to current challenges of the time (Table 2.4.1).

To foster digital competencies and ensure data protection, programs include disciplines such as:

NARXOZ UNIVERSITETI	**"Cybersecurity Law and Fundamentals of Artificial Intelligence", "Legal Logic"**

Table 2.4.1.
List of Innovative EP Implemented in Higher Education Institutions

HEI (Developer)	**Educational Program Title**
K. Zhubanov Aktobe Region al University	6B04203 Law and Business
Kh. Dosmukhamedov Atyrau University	7M04213 Ethnomediation
M. Utemisov West Kazakhstan University	6B04204 Legal Regulation of Entrepreneurial Activity
Innovative Eurasian University	6B04203 Legal and Customs Regulation of Foreign Economic Activity
Al-Farabi Kazakh National University	7M04212 Maritime and Energy Law
Sh. Yessenov Caspian University of Technology and Engineering	6B04204 Maritime Law
Sh. Ualikhanov Kokshetau University	7M04204 Anti-Corruption Compliance
Turan-Astana University	6B04203 Digital Jurisprudence
Kunaev University	6B04210 IT Lawyer
Narxoz University	7M04203 European and International Business Law
M. Auezov South Kazakhstan University	7M04219 Anti-Corruption Activities and Compliance Service
M. Auezov South Kazakhstan University	7M04209 Law (by Branches)

MNU	**“Emotional Intelligence”, “Digital Project on Public Law”, “E-Criminal Proceedings based on the Unified Register of Pre-Trial Investigations”, “Cybersecurity”**
	“Information Technology in Legal Practice,” “Ensuring Information Security of Law Enforcement Agencies”

Out of the total number of legal educational programs, **62.5% (210 programs)** have been accredited, and **95% (310 programs)** have been updated in line with modern requirements. Based on professional standards, **168** programs have been revised, including those updated in accordance with specific professional standards.

Updated based on professional standards →	**168** EP, of which↓

67 EP	Legal support for the innovative project
60 EP	Professional standards for academic staff of higher and/or postgraduate education institutions
12 EP	Forensic Ballistic Examination

Despite significant progress in the development of legal education in Kazakhstan, including active efforts by the state, universities, and the professional community, structural challenges remain that require a systemic and strategically calibrated response.

Since independence, the legal profession has occupied a central role in the formation and consolidation of the country’s legal system. In the early years of sovereignty, the primary task was to establish a solid regulatory framework capable of ensuring the stable functioning of all branches of power and state institutions. At the present stage, in the context of building a “**New Kazakhstan**,” the importance of legal education not only persists but continues to grow.

At the same time, legal education faces a number of challenges that hinder the development of a competitive legal workforce. One of the most acute problems remains the persistent gap between the theoretical content of educational programs and the practical requirements of the legal profession. Despite recognition of the importance of the professional community’s role in training, its participation in the educational process remains fragmented and unsystematic. Employers are rarely engaged in program design, while permanent business councils or similar advisory bodies at law faculties are almost absent. This complicates the development of up-to-date, market-oriented graduate profiles.

The problem is further exacerbated by unresolved issues of long-term sustainability in personnel policy. In particular, the low attractiveness of an academic career–

especially in the regions–leads to a shortage of qualified faculty, including specialists with international experience. Additional difficulties stem from the unbalanced specialization of bachelor's programs which, despite awarding the universal qualification of "Bachelor of Law," are often structured as narrowly focused, thereby limiting the flexibility of graduates' career trajectories and reducing their perceived value in the labor market.

The absence of a unified graduate profile ensuring a minimum expected level of professional competencies is compounded by the high number of law faculties, often within universities that lack a legal specialization, making it difficult to maintain quality standards nationwide. For instance, **in Kazakhstan, 61 higher education institutions train personnel in the field of Law, including technical, agricultural, and pedagogical universities.**

This figure significantly exceeds comparable indicators in countries with similar population sizes. For example, **Romania has fewer than 10 law faculties across 66 universities, while the Netherlands has only a handful of law programs among its 21 universities.** Consequently, the quantitative dominance of law programs in Kazakhstan hampers the enforcement of unified quality standards, undermines the manageability of the system, and creates risks of devaluing the legal profession.

Special attention is also required for the teaching of law in the state language. The lack of a unified terminological base, a shortage of teaching materials, and an insufficient number of qualified Kazakh-speaking instructors constrain the development of full-fledged legal education in Kazakh. Furthermore, the absence of a professional standard for the occupation of "Lawyer" hinders the unification of learning outcomes and reduces the predictability of qualifications for employers.

Taken together, these challenges highlight the need for a **comprehensive modernization of the legal education system**, grounded in the principles of practice-oriented learning, institutionalized engagement with employers, and the standardization of basic requirements for educational outcomes.

Alongside its challenges, legal education in Kazakhstan holds significant potential for qualitative transformation and further development. Its strengths and strategic opportunities can be outlined as follows:

1. international cooperation among Kazakhstani law schools is being strengthened. Participation in academic exchanges, international programs, and the growing interest of foreign universities in partnering with Kazakhstani institutions contribute to the internationalization of educational programs. This provides access to best international practices and enhances the competitiveness of national law diplomas in the global market.

2. technology is advancing rapidly, and legal education is beginning to integrate artificial intelligence tools and digital legal systems into the learning process. The inclusion of modules on working with AI, automated document management, and LegalTech tools makes it possible to prepare specialists capable of operating effectively in the context of the profession's digital transformation, focusing on analytical and strategic tasks.

3. attention is being given to the development of universal and transversal competencies. In particular, communication skills, emotional intelligence, creative thinking, as well as language and interdisciplinary competencies play an important role. The implementation of multilingual education strengthens graduates' ability to work in the international legal environment and adapt to the global diversity of legal systems.

4 the growing demand for qualified legal professionals is driven by the expansion of legal institutions, economic development, and greater international legal integration. This creates favorable conditions for broadening the professional scope of lawyers, including in such areas as justice, corporate law, regulation of the digital economy, and international law.

At the same time, government measures are being undertaken to improve the quality of legal education. In particular, the number of universities implementing legal education programs has been reduced from 71 to 61, and the minimum admission score for legal specialties has been raised from 50 to 75. These steps are aimed at increasing the academic level of incoming students and attracting more motivated and better-prepared applicants, which, in the long term, should positively impact the quality of training for the country's legal system.

Concept of Legal Education

To address systemic problems and realize the strategic potential of legal education, a Concept has been developed that envisions a comprehensive transformation of the system for training legal professionals by 2030.

The central focus of the Concept for the Development of Legal Education in the Republic of Kazakhstan for 2025–2030 is the transition to a competitive regulatory model through the introduction of an independent ranking of educational programs and the expansion of academic freedom of universities–not only in academic matters but also in managerial decision-making.

The transformation of approaches to state regulation and the expansion of academic freedom constitute a system-forming dimension of the Concept, ensuring the institutional conditions for the sustainable improvement of the quality of legal education. The starting premise is the recognition of legal education as an integral part of the legal system, the quality of which directly determines the formation of the rule of law, the effectiveness of human rights protection, and citizens' trust in state institutions. In this context, the development of legal education requires not so much formal control as a flexible and competitive regulatory model that stimulates universities to pursue continuous improvement.

The key mechanism of transformation is the creation of an independent ranking of educational programs in the field of "**Law,**" with the involvement of the professional legal community and relevant employers in its design and implementation. This ranking should become not only a tool for monitoring quality but also an effective lever for resource allocation: its results will be taken into account in the recruitment of personnel for public service and in the distribution of the state educational order. This will ensure a direct link between the quality of educational activities and access to state support mechanisms, creating a sustainable incentive for the development and renewal of programs.

An important aspect is the expansion of academic freedom. The Concept proposes to move beyond purely academic matters and grant universities greater autonomy in managing human and financial resources. In particular, it is envisaged to empower state universities with the right to independently establish faculty remuneration systems based on the principles of meritocracy and performance. This measure is aimed at reducing staff turnover, enhancing the prestige of the academic career, and strengthening competition for the best talent.

Special attention is given to restoring mechanisms of state

support for the training of lawyers, since legal education is currently de facto excluded from the scope of priority public funding. At the same time, the demand for qualified legal professionals is growing due to the increasing complexity of economic processes, the expansion of the private sector, and digitalization. The Concept proposes to increase the volume of state-funded places and to link their allocation to objective quality indicators in specific universities, thereby eliminating the practice of mechanical, residual-principle financing.

An important element of this direction is the strengthening of institutional cooperation between universities through the optimization of the activities of the Educational and Methodological Association in the field of **Law** (EMA). All universities implementing legal programs should be included in the EMA on a mandatory basis. This will establish a systemic exchange of experience, the development of unified methodological approaches, and the creation of a sustainable expert environment capable of acting both as an arbiter of quality and as a driver of curriculum renewal.

Taken together, these measures are aimed at transitioning from formal administration to an intellectually managed system of legal education development, where the state sets the framework and incentives, while universities compete on quality, innovation, and recognition by the professional community.

The Concept also envisions the improvement of curriculum content. To overcome the fragmentation of programs and enhance the employability of graduates, a unified **graduate profile** and a **professional standard of "Lawyer"** will be developed. Educational programs will be strengthened in the teaching of philosophy of law and theory of state and law, using a comparative approach, as well as in the area of language training. Every graduate will be required to master the state language at a level sufficient for law-making activities, as well as English for accessing international sources and developing critical thinking. Polylingual tracks will also be introduced, and a corpus of legal Kazakh language will be developed.

From the perspective of practice-oriented competencies, legal clinics play a crucial role. They not only develop professional skills in law enforcement and legal counseling but also instill a sense of social responsibility in future lawyers. Therefore, the Concept proposes to expand clinical legal education as an integral part of legal training programs, with the possibility of recognizing experience gained in legal clinics as part of official professional work experience.

The formation of students' anti-corruption culture and commitment to academic integrity is ensured through the implementation of ethical standards, the creation of internal systems for responding to violations, and the encouragement of university membership in the Academic Integrity League, which is taken into account when forming rankings.
To address the shortage of qualified academic staff, the Concept provides for a revision of the rules for awarding PhD degrees, an increase in the state order for doctoral training, optimization of the system of scientific supervision, and stimulation of research schools.
An institutional framework for the professional development of academic staff is being established, including the development of relevant programs based on the Educational and Methodological Associations (EMA). The Concept envisages a transition from a "law-centered" to a "doctrine-centered" teaching model and

the organization of mass production of new textbooks in Kazakh and Russian, with state support and methodological guidance.

To enhance the attractiveness of an academic career for lawyers, mechanisms for direct research funding, social guarantees for scholars, a system of personal KPIs for research schools, and a transition to teaching and research academic tracks are provided. The Concept also includes measures to expand publication opportunities through the creation of a domestic citation database, support for departmental journals, and their promotion in international databases.

At the same time, integration with the professional legal community is being strengthened, involving it in the development and updating of educational programs, teaching, and final assessment. Business advisory boards are being introduced at faculties, employer-led courses, and dual education programs. Mandatory accreditation of programs by professional associations will serve as an additional guarantee of the quality and relevance of graduate training.

The new approaches of the Concept encourage universities to actively participate in academic mobility programs, develop joint research projects, and implement double-degree programs with foreign partners. Internationalization is accompanied by the introduction of multilingual education, adaptation to international quality standards, and international accreditations, which enhance the attractiveness and inclusiveness of domestic programs.

Thus, the implementation of the Concept will make it possible to establish a modern, ethically oriented, and internationally recognized system of legal education, capable of effectively responding to contemporary challenges and preparing a new generation of lawyers.

MAQSUT NARIKBAYEV
KAZGUU UNIVERSITY

Implementation of the Concept at Maqsut Narikbayev University

MNU systematically implements initiatives aligned with the priority areas of the Concept for the Development of Legal Education in the Republic of Kazakhstan for 2025–2030. The university serves as one of the leading platforms for introducing innovative approaches in legal education, language transformation, technology integration, and the internationalization of legal training.

Implemented activities within the framework of the Concept

1. **Internationalization and language transformation**
2. **Integration of AI into educational programs**
3. **Development of the legal Kazakh language**
4. **Practice-oriented training and legal clinic**
5. **Professional development of academic staff**
6. **Academic integrity and anti-corruption culture**
7. **Development of bilingual textbooks**

2.5. Practice-Oriented Learning: Innovative Sessions and Partnerships with Employers

Practice-oriented learning (POL) is an educational approach aimed at integrating academic knowledge with real professional tasks, enabling students not only to master theoretical concepts but also to acquire applied skills that are in demand in specific industries. The relevance of this approach is determined by the ongoing transformation of the socio-economic environment, characterized by digitalization, rapid technological development, and the high volatility of labor market requirements. These dynamics demand that graduates possess not only a solid theoretical foundation but also the ability to enter professional activities immediately from the first days of employment.

Practice-oriented learning is viewed as an effective tool for increasing the relevance and applied focus of higher education, helping to bridge the gap between academic knowledge and professional practice. It is also aimed at fostering transversal 21st-century competencies, including analytical and critical thinking, the ability to solve complex applied problems, and effective interaction in interdisciplinary and team-based environments [21].

Practice-oriented learning methods are developed on the basis of **David Kolb's theory** and represent one of the most well-founded and applicable approaches to the organization of modern education, aimed at the development of professional skills and sustainable knowledge. This theory underpins most contemporary models of practical learning, as it systematically describes the process of transforming experience into meaningful knowledge, practical abilities, and stable competencies.

At the core of this concept lies the idea that learning does not occur through passive perception of information but through active interaction with real situations and their reflection. Kolb proposed a model in which effective learning is constructed as a cycle of four sequential stages [22].

The first stage is **Concrete Experience** – a situation in which the learner directly participates, whether it be a project, a simulation, or workplace practice. This is followed by **Reflective Observation,** where the student analyzes what happened, what worked, and what difficulties arose. This reflection then leads to the formulation of more general patterns or principles – the stage of **Abstract Conceptualization.** Finally, the conclusions drawn are tested in practice through **Active Experimentation**, where the learner tries new approaches in new contexts. This cycle can be repeated multiple times, each iteration deepening understanding and building greater confidence in one's actions.

The key value of this approach lies in the fact that it does not merely transmit knowledge but enables learners to construct it themselves based on personal experience – a factor of particular importance in professional training. For example, a student working on a real project within a course not only learns to apply theoretical knowledge but also develops critical thinking, self-assessment skills, and decision-making under

uncertainty. This approach equips future professionals not only with practical skills but also with metacompetencies – the ability to learn from one's own experience, adapt to new situations, work in teams, and assume responsibility.

The first stage is **Concrete Experience** – a situation in which the learner directly participates, whether in a project, a simulation, or workplace practice. This is followed by **Reflective Observation**, where the student analyzes what has occurred, what worked, and what created difficulties. This reflection then leads to the development of broader patterns or principles – the stage of **Abstract Conceptualization**. Finally, the learner tests these conclusions in practice through **Active Experimentation**, trying out new approaches in new contexts. This cycle can be repeated multiple times, each iteration deepening understanding and increasing confidence in one's actions.

The key value of this approach lies in the fact that it does not merely transfer knowledge but enables learners to construct it themselves on the basis of personal experience – a feature especially important in professional training. For instance, a student working on a real project within a course not only learns to apply theoretical knowledge but also develops critical thinking, self-assessment skills, and the ability to make decisions under uncertainty. Such an approach equips future professionals not only with **professional skills** but also with **metacompetencies** – the ability to learn from one's own experience, adapt to new situations, work effectively in teams, and take responsibility.

Kolb also proposed the concept of learning styles, according to which different individuals prefer different ways of acquiring knowledge. Some perceive information more effectively through analysis and theoretical reflection, while others do so through practice and trial. This makes practice-oriented learning particularly flexible, as it can be adapted to the individual characteristics of learners. At the same time, instructors, being aware of these differences, can vary methods and formats, thereby increasing the effectiveness of the educational process.

For example

- the **Diverging** style combines Concrete Experience and Reflective Observation; such learners tend to view situations from multiple perspectives, possess strong imagination, and are attentive to detail.
- The **Assimilating** style combines Reflective Observation and Abstract Conceptualization; it is characterized by a preference for logic, structure, and systematization of knowledge, with a focus on theoretical understanding.
- The **Converging** style combines Abstract Conceptualization with Active Experimentation and is manifested in the ability to apply theoretical knowledge to solve practical problems.
- Finally, the **Accommodating** style combines Concrete Experience and Active Experimentation; learners with this style prefer learning through direct engagement, experimenting with new approaches in practice, often relying on intuition and personal experience rather than prolonged analysis, and easily adapting to changing conditions. (Table 2.5.1.).

Thus, methods based on Kolb's theory underpin many modern forms of practice-oriented learning and serve as an effective tool for preparing students for the real

Table 2.5.1.
Kolb's Learning Styles and Corresponding Practice-Oriented Learning Methods

Source:
compiled on the basis of David Kolb's theory (1984)

Learning Style	Preferred Kolb Cycle Stages	Description	Typical Disciplines and Professions	Practice-Oriented Learning Methods
Diverging	Concrete Experience + Reflective Observation	Empathetic and observant, able to view problems from multiple perspectives, inclined toward creative thinking.	Humanities: teachers, psychologists, sociologists, cultural studies specialists. Sciences: ecologists, urban planners with a social focus.	Observation, reflective journals, teaching practice, group discussions, case analysis, social projects.
Assimilating	Reflective Observation + Abstract Concep-tualization	Prefer analyzing information, building concepts, and systematizing knowledge. Oriented toward logic and theory.	Humanities: legal theorists, philosophers, lecturers. Sciences: mathematicians, physicists, systems analysts.	Theoretical analysis, essay and review writing, legal reviews, modeling, simulations, working with sources.
Converging	Abstract Concep-tualization + Active Experimentation	Able to apply theory in practice, focus on problem-solving and technical aspects.	Humanities: law enforcers (judges, civil servants), analysts. Sciences: engineers, IT specialists, technologists.	Moot courts, technical projects, laboratory practicums, case solving, drafting legal documents, engineering modeling.
Accommodating	Concrete Experience + Active Experimentation	Learn through action and trial, adapt quickly, tend to make intuitive decisions.	Humanities: lawyers, managers in education and communications, marketers. Sciences: entrepreneurs, startup founders, project managers.	Internships, legal clinics, entrepreneurial practice, business games, hackathon participation, field rese

professional environment.

The main methods of practice-oriented learning include:

- Dual education, in which training takes place simultaneously at the university and in the workplace.
- Project-based learning and problem-based learning, where students work in groups to solve real-world tasks.
- Internships and industrial practice in organizations, providing direct immersion in the professional environment.
- Simulation models approximating real practice (e.g., moot courts in law schools, virtual clinics in medicine, business and management games).
- Legal, medical, and business clinics, where students work with real clients under the guidance of mentors.
- The case method, based on the analysis of real situations and the development of solutions.
- The flipped classroom, where theoretical material is studied independently and classroom time is devoted to practice.
- Hackathons, acceleration programs, and startup projects, which develop teamwork and innovation skills.
- Work in FabLabs, makerspaces, and engineering laboratories, where students design and produce real products.
- Challenge-based learning, focused on solving tasks provided by external clients.
- University-based practical training, including the organization of events or consulting projects.
- Field studies, expeditions, and portfolio development, reflecting professional achievements and the learner's development trajectory.

Empirical research provides convincing evidence of the high effectiveness of active and practice-oriented forms of learning compared to traditional lectures. For example, a meta-analysis covering 225 studies and more than 29,000 students in STEM disciplines found that active learning – including group work, problem-solving, case methods, and other formats – produced an average improvement in learning outcomes of **0.47 standard deviations**, which is equivalent to moving from an average grade of "C" to a "B." In addition, the share of students who failed a course decreased from **33.8%** to **21.8%**, i.e., by nearly one-third. The authors emphasize that maintaining an exclusively lecture-based format when more effective alternatives are available may be considered academically and pedagogically unjustifiable, and even unethical [23].

Similar conclusions are presented in a review showing that approaches such as **project-based** and **problem-based learning** contribute not only to improved academic results but also to the development of applied skills – particularly in engineering education. It highlights that the greatest effect is achieved when active methods are **integrated holistically** into the course structure, whereas their fragmented use yields only limited results.

Thus, research data clearly point to the necessity of embedding practice-oriented approaches into the educational process as one of the key conditions for enhancing its effectiveness and ensuring its alignment with the demands of the modern professional world [24].

2.5.1. Implementation of Practice-Oriented Learning in Kazakhstani Universities: Directions, Examples, and Challenges

Efforts to advance practice-oriented learning in Kazakhstani universities represent a holistic approach to aligning

higher education with the requirements of the real professional environment. This process can be conditionally structured into six key areas, which collectively form an educational environment focused not only on the acquisition of theoretical knowledge but also on the development of applied competencies that meet labor market demands. These areas are not isolated initiatives but rather interconnected elements of a systemic transformation of higher education toward enhancing its applied potential.

1 Minimization of Theorization in Educational Programs

One of the key directions of practice-oriented learning is the minimization of excessive theorization in the structure of educational programs. The essence of this approach lies in the critical revision of curricula to optimize the balance between theoretical and practical components. Particular emphasis is placed on reducing the share of lecture-based instruction and increasing the volume of practice-oriented formats–such as seminars, laboratory work, project-based learning, and problem-based learning. Such transformation contributes to the development of sustainable applied skills and smoother adaptation of graduates to the professional environment.

A number of universities have already taken concrete steps in this direction. For example, teaching hours have been redistributed in favor of seminars, laboratory sessions, and project-based formats, which has intensified student participation in active learning.

However, despite these examples, practice shows that in some universities the work on reducing theorization remains more declarative in nature. Often, it is limited to revising curricula on paper without the real implementation of new methodological and organizational mechanisms. The lack of systemic adjustment in program content, teaching formats, and learning outcomes assessment indicates a superficial character of such changes. This, in turn, reduces the potential impact of reforms and highlights the need for deeper elaboration of this reform, with mandatory alignment to qualification requirements and employer expectations.

2 Practice-Oriented Teaching Methods

Применение практико-ориентированных
The application of practice-oriented teaching methods in universities demonstrates a strong dependence on the field of study. Most often, such methods are applied in engineering and technical, medical, pedagogical, and aviation programs. In these areas, the educational process includes project-based and problem-based learning (PBL), laboratory and simulation practicums, industrial internships, as well as engagement with real professional case studies.

For example, in specialized institutions such as the **Academy of Civil Aviation**, the practice-oriented approach is implemented through the use of professional simulators, including full-scale cockpit mockups, ground service training devices, and systems for simulating flight and emergency situations. This enables future aviation specialists to practice action algorithms in conditions close to real-life and to increase their readiness for practical work even before entering industrial practice.

In disciplines such as the humanities, social sciences, and law, practice-oriented methods are applied in the form of case studies, business games, and through the involvement of professional experts in the educational process. In a number of universities, changes have been introduced into academic policy that expand the forms of final assessment through practice-oriented formats, such

as creative assignments, project-based tasks, and project defense. This strengthens the applied dimension of evaluating educational outcomes.

One of the key directions in the development of practice-oriented learning is the gradual transition from the traditional format of thesis writing to the implementation of **capstone projects** aimed at solving specific tasks from the real sector. While most students still opt for writing a research thesis as part of their final assessment, a number of universities are actively introducing an approach in which the graduation project becomes an instrument of interaction with employers and includes the development of solutions applicable in industrial, educational, or social practice. Such projects are formed on the basis of requests from partner enterprises, educational institutions, or regional organizations, allowing students to acquire professional competencies under conditions close to real practice. This integration of academic training with real-sector tasks helps to reduce the gap between theory and practice, increases student motivation, and strengthens the applied potential of educational programs.

For the further advancement of practice-oriented learning methods, attention must be paid to the development of a **methodological framework** that ensures reproducibility, pedagogical sustainability, and comparability of learning outcomes when applying different practice-oriented formats. In addition, to scale successful practices, it is necessary to create conditions for **experience-sharing among universities**, develop tools for evaluating the effectiveness of implementation, and strengthen the **material, technical, and digital infrastructure** capable of supporting practice-oriented formats across different educational fields.

3 Profiling Educational Programs in Line with Regional Needs

The essence of this approach lies in adapting the content and structure of programs to the needs of local labor markets, key industries, and priority development areas. Such a model enables universities to act as regional centers for talent development and expertise, capable not only of preparing graduates with relevant competencies but also of fostering sustainable linkages with the local production ecosystem.

In this context, the Atlas of New Professions, developed both by industry and by region, serves as an important tool. Its integration into the design of educational programs allows universities to align not only with current but also with anticipated labor market demands, thereby enhancing the sustainability and relevance of graduate training.

In a number of universities, the profiling of educational programs demonstrates a deliberate and institutionalized implementation. For instance, **Yessenov University** is developing logistics programs directly oriented toward the needs of the port and transport infrastructure of the Caspian region. **S. Amanzholov East Kazakhstan University** and **D. Serikbayev East Kazakhstan Technical University** are building student training programs around the industrial and mechanical engineering potential of East Kazakhstan, integrating elements of industrial practice, project activities, and partnerships with regional enterprises.

4 Links with Industry and Employer Participation

The effective implementation of a practice-oriented model of higher education is impossible without the systematic and sustained involvement of employers. This includes not only providing

internship bases but also participation in the design, implementation, and evaluation of educational programs, as well as the establishment of stable feedback channels regarding the quality of graduate training. The shift toward a competency-based model of education requires the professional community to become an equal partner in the educational process.

Universities demonstrate examples of deep integration with the production sector: employers participate in the development of curricula, act as co-lecturers and mentors, and are involved in the defense of graduation projects and the assessment of students' practical skills. Institutions have established long-term cooperation platforms that include joint training programs, internships with elements of dual education, and collaborative project sessions.

However, in some cases, cooperation with employers remains formal and fragmented. Signed memoranda of cooperation are often not supported by real mechanisms for industry representatives to participate in the educational process. In such cases, formal agreements with employers need to evolve into sustainable partnership formats, involving joint curriculum development, industry participation in teaching and mentoring, as well as regular feedback that influences the content and delivery of educational programs.

5 Organization and Quality Assessment of Professional Internships

Professional internships are a crucial component of students' applied training and are regarded as a full-fledged educational module aimed at developing professional competencies in a real work environment. Effective organization of internships requires coordination with host organizations, methodological support for students, as well as a system for assessing achieved outcomes.

In a number of universities, efforts have been made to institutionalize the internship process. Elements of digital monitoring of internships, structured assignments, and regular feedback from mentors and employers have been introduced. These measures make it possible to record students' individual achievements, increase the transparency of internships, and provide feedback for subsequent program improvement.

An example of an effectively organized internship quality assessment process can be found at **Rudny Industrial Institute**. The university has implemented a system for accrediting students' practical skills, carried out through specially established Expert Councils with the participation of representatives from key regional enterprises. Accreditation is conducted in several stages, includes quantitative assessment, and concludes with the issuance of a certificate. The accreditation results directly affect whether the internship is credited; if the minimum score is not achieved, the internship is considered incomplete. Moreover, the accumulated points serve as a basis for automatic employment of students at partner enterprises. This model ensures an objective assessment of competency acquisition and creates a direct link between university training and the real career trajectories of graduates.

The approach implemented at **D. Serikbayev East Kazakhstan Technical University** is characterized by a focus on performance and early professionalization. Here, industrial practice is organized within the framework of a practice-oriented training model for engineering personnel based on **CDIO standards (Conceive – Design – Implement – Operate)**. This approach enables students to acquire

a basic engineering qualification in the course of their practice.

At **Margulan University**, digital tools have been introduced to support teaching practice, one of the key elements of which is the **electronic trainee's diary**, automatically generated and integrated into the university's LMS platform. This tool allows for the assignment of tasks, recording their completion, and two-way monitoring by both the university instructor and the workplace mentor. The electronic diary is coordinated with the host educational organization and serves as an important instrument for ensuring transparency, manageability, and documentary support of practice, enabling effective tracking of each student's individual progress.

To increase the effectiveness of professional practice in universities, it is important to strengthen the development of **unified methodological standards**, clear practice plans, individualized assignments, and assessment systems that allow for an objective measurement of students' mastery of professional competencies. Additional attention should be given to the introduction of **digital monitoring tools and evaluation scales**, which would make practice more manageable, comparable, and outcome-oriented.

The development of a sustainable model of professional practice requires moving toward a structured, supervised, and verifiable format, based on close **partnership with employers**, digital support, and the use of electronic tools to document, track, and evaluate practice outcomes, including individualized tasks, employer feedback, and progress in mastering professional skills.

6 Dual Education

The dual education model is a format in which students receive training both within the academic setting of the university and in a real production environment. Elements of dual education are being introduced in most universities across the country, shaping an educational trajectory that alternates between theoretical and practical blocks. The implementation of this model is carried out in accordance with the Rules for the Organization of Dual Education, approved at the national level. More than half of the students enrolled in the dual education model are concentrated in pedagogical, engineering, and technical fields of study.

To monitor the state of dual education and identify systemic barriers, in 2024 the National Center for the Development of Education of the Ministry of Science and Higher Education of the Republic of Kazakhstan conducted a specialized survey involving 36 universities and employers. Analysis of the responses from universities and employers made it possible to highlight key problem areas that limit the development of dual education. Both sides–universities and employers–primarily noted the insufficient motivation of students, indicating the presence of a deeper systemic issue that requires coordinated efforts.

Another factor affecting the sustainability of the dual model is the issue of financial incentives for students. According to the survey results, over 60% of universities reported the absence of payment for internships. Only 25.7% of institutions confirmed the existence of compensation, while 14.3% noted that payments are made selectively, at the initiative of individual enterprises.

From the employers' perspective, the main barriers are distributed as follows:

- **Lack of time among mentors (52.1%)** – due to the high workload of specialists;

- **Significant financial costs** associated with supporting dual education (19.9%);
- **Organizational difficulties** in integrating the educational process into the production environment (19.3%).

From the universities' perspective, the main challenges include:

- **Difficulties in organizing workplace-based learning (24.2%)** – including student transportation, provision of workwear, and availability of training facilities;
- **Mismatch between curricula and enterprise needs (18.2%)**;
- **Shortage of mentors** on the employer side (9.1%).

In addition, there is a **lack of methodological solutions** for structuring dual program curricula, balancing academic and workplace-based workloads, and assessing outcomes achieved in production settings. This constrains the scaling of the dual approach, despite its high potential effectiveness.

To overcome these limitations, a **systemic restructuring** is required, including the development of **public–private partnership models** that ensure sustainable and institutionalized participation of enterprises in the educational process. It is also necessary to introduce **flexible academic formats** that enable the effective integration of workplace-based learning into the structure of educational programs without compromising their academic quality.

2.5.2. Competence Centers and Scientific-Technical Sessions

Competence Centers

Competence centers are specialized structural units established within universities, research organizations, or in partnership with business, aimed at accumulating, developing, transferring, and disseminating advanced knowledge, skills, and practices in priority subject or professional areas.

Their main function is to concentrate expertise and resources necessary for the formation of relevant competencies among students, faculty, industry specialists, and other stakeholders. Such centers serve as institutional intermediaries between the academic environment and the real sector of the economy, ensuring the continuous adaptation of educational content to labor market demands, technological changes, and professional standards.

In Kazakhstan, the establishment of competence centers has gained momentum in recent years, largely as a response to the need to enhance the practice-orientation of higher education. In some cases, they have been transformed from institutes of professional development, while others have been newly created within programs of digitalization, educational modernization, and sectoral cooperation. According to current data, more than 30 such centers are operating within Kazakhstani universities. Their activities cover professional retraining, implementation of micro-qualifications, certification under international standards, as well as educational and consulting services for business and the wider public.

The results of a survey conducted among more than 30 universities show that the key areas of activity of the centers include

IT training, inclusive education, and the implementation of formal and non-formal learning programs, including micro-qualifications.

In particular, the most successful practices are carried out at the **Center of Competence and Excellence at Astana IT University**, which collaborates with global technology companies (Huawei, Cisco, Microsoft, AWS, and others), provides international certification, implements Foundation and MBA programs, and annually trains around **5,000 learners** from various categories – from school students to corporate clients.

Other universities also demonstrate positive practices.

For example, at **Abylkas Saginov Karaganda Technical University,** the Center for IT Competencies has carried out a large-scale update of educational programs in line with professional standards and introduced an MOOC platform.

At **Rudny Industrial Institute**, a **Center for Strength Engineering Analysis** was opened in partnership with the company FIDESYS, specializing in high-precision engineering calculations for industry and joint accreditation of programs with employers.

At **Karaganda Industrial University**, in cooperation with the **Belarusian State Pedagogical University**, joint courses and programs are implemented for different age and professional groups, including micro-qualifications and corporate training.

At **Toraighyrov University**, since 2022, the **Center for Continuing Education "EXTENSION"** has been operating with the main goal of creating the necessary conditions to meet the demand of the adult population for updating knowledge and skills in line with labor market requirements and for providing non-formal education.

At **Kozybayev University**, professional certification has been integrated into the learning process. For instance, students of the Accounting and Auditing program can obtain a **1C Accounting certificate** at the University's Certification Center. Within the framework of the Faculty of Agrotechnology, the **Bay Dala Center** has been established, offering additional educational and research activities. Graduates also have the opportunity to obtain an **international certificate in the vaccination of agricultural animals and poultry** through the Certification Center in partnership with the French company CEVA SANTE ANIMALE.

The **Center for Pedagogical Excellence**, established at the **Arkalyk Pedagogical Institute named after Y. Altynsarin**, is a specialized platform aimed at enhancing the professional competencies of both practicing teachers and future educators. The center's primary mission is to create conditions for continuous professional development through the implementation of educational programs, methodological support, organization of training sessions, and practice-oriented activities. The center actively functions as a platform for the exchange of experience among teachers of different generations, as well

as for interaction with representatives of the education system, public organizations, and other stakeholders.

In December 2024, the **Ministry of Science and Higher Education of the Republic of Kazakhstan** adopted the Order "On the Approval of the Procedure for Establishing Competence Centers on the Basis of Educational Organizations of the Republic of Kazakhstan," implementing paragraph 74 of the **Action Plan for the Implementation of the Concept for the Development of Higher Education and Science for 2023–2029**. This regulatory document establishes unified organizational and procedural principles for the creation and operation of competence centers within universities and other educational organizations. Its adoption became an important step toward the institutionalization of this form of interaction between the academic community and sectoral partners.

Competence centers are regarded as institutional platforms that ensure the development of relevant professional skills, the implementation of lifelong learning programs, and the establishment of strong connections between academia and industry. Special emphasis in the document is placed on bridging the structural gap between the content of educational programs and the needs of the economy–through the inclusion of real industrial tasks, the development of practice-oriented formats, and the continuous renewal of learning content.

A key focus of competence centers' activities is the introduction of a student certification system recognized by the labor market. The recommendations highlight the need to move from formal training to verified confirmation of acquired skills, including through independent and industry-based certification developed jointly with professional associations and companies. Provisions include the creation of a database of issued certificates, the ability to verify document authenticity via QR code, the introduction of accreditation for educational programs, and the certification of faculty. These measures help to ensure transparency and trust in learning outcomes, make competence centers a fully integrated element of the national qualifications system, and improve graduate employability.

Scientific-Technical Sessions

As part of efforts to strengthen the applied orientation of science and reinforce ties between the academic sector and industry, Kazakhstan is introducing the mechanism of scientific-technical sessions (hackathons). These events represent intensive formats of collective work by researchers, engineers, students, and business representatives aimed at finding applied solutions for specific industrial challenges. Hackathons enable the rapid development of technological proposals that can be promptly implemented at enterprises, thereby narrowing the gap between scientific research and the real needs of the economy.

The coordination of hackathons is carried out by the **Science Fund** as the working body of the Ministry of Science and Higher Education of the Republic of Kazakhstan, in partnership with major national companies. These activities are designed to foster the development of a scientific and innovation ecosystem and to institutionalize a platform for dialogue between universities, research centers, and industrial clusters.

The practice of organizing hackathons has already demonstrated its effectiveness in building partnerships between Kazakhstani science and the priorities of large-scale industries. A clear example of successful collaboration is provided by scientific-technical sessions.

In 2024, seven such sessions (hackathons) were held in different cities of Kazakhstan–Zhezkazgan, Kyzylorda, Petropavlovsk, Astana, Temirtau, Aktobe, and Pavlodar–organized in cooperation with major Kazakhstani enterprises, including **Kazakhmys, Kazatomprom, ERG, KazMinerals, KarMet, Kazakhoil Aktobe,** and through an **agri-hackathon**.

Thus,

- more than **400 scientists and experts** were engaged in the scientific and technological sessions,
- resulting in the formulation of over **100 scientific and technical solutions** to address company-specific challenges. At the meeting of the Higher Scientific and Technical Commission (HNCC),
- **11 technical assignments** were presented based on the outcomes of the sessions with Kazakhmys, ERG, and Kazatomprom.

As a result, **10% of the total volume of scientific and technical assignments this year** were derived directly from real collaboration with major enterprises.

Хакатон-2025. Астана.
«Университеты Казахстана – драйверы развития страны»

semeynews.kz

Хакатон-2024. Павлодар.
«Kuick Hack'24.»

np.kz

Хакатон-2024. Жетісу.
«Антикоррупционный хакатон Antikor Hackathon»

zakon.kz

CONCLUSIONS

The system of higher and postgraduate education in the Republic of Kazakhstan is undergoing a phase of systemic transformation, driven by the need to integrate into the knowledge economy and to establish forward-looking models of workforce training. Contemporary challenges – technological shifts, a shortage of qualified labor, and global competition – require universities not merely to respond to existing labor market demands but to act as proactive agents of change, shaping the competencies of the future and contributing to the development of entire industries. In this context, higher education is increasingly regarded not as an autonomous academic sector, but as a **strategic element of the national innovation system**, ensuring productivity growth, technological modernization, and economic resilience.

Kazakhstan is building a **multi-level architecture of education–industry interaction**, centered on flexible and continuously updated educational programs. Leading universities are developing innovative curricula informed by the Atlas of New Professions and sectoral forecasts, embedding mechanisms of anticipatory training in fields critical to the future economy. At the same time, sector-specific educational development concepts (engineering, law, and others) are being implemented, creating institutional frameworks for standardizing graduate requirements, integrating professional standards into curricula, and involving industry partners in the governance of the educational process.

A key element of applied transformation has been the establishment of **competence centers**, whose activities focus on developing specialized skills, certification, and accelerated retraining. These centers act as infrastructural hubs linking universities with employers, facilitating knowledge transfer, delivering micro-qualifications, and expanding lifelong learning opportunities. Their institutionalization was formally codified in 2024, giving the process a systemic foundation. In parallel, **scientific and technological hackathons have been introduced** – a format that enables the rapid development of solutions to industrial challenges through collaboration between academia and industry, thereby contributing to the transformation of science into a productive force for the economy.

Thus, a **balanced model of higher education** is taking shape, one in which universities' academic freedom is combined with state mechanisms of quality assurance, sectoral priorities, and the innovation demands of the economy. Such a model ensures not only the flexibility of educational trajectories and adaptability to change but also enhances universities' institutional responsibility for outcomes – in terms of employment, technological contribution, and the formation of the country's human capital sovereignty. Collectively, these measures create a foundation for the sustainable development of higher education as a systemic driver of Kazakhstan's modernization.

Chapter 3.

Key Indicators of the Higher Education System of the Republic of Kazakhstan

3.1. Network of Higher Education Institutions: Status and Development

In 2024, the number of higher education institutions in Kazakhstan increased from 120 to 122 (Figure 3.1.1).

One of the key factors that influenced the increase in the number of universities was the restoration of a specialized higher education institution in the field of water management and irrigation. In April 2024, following the instruction of the President of the Republic of Kazakhstan, Kassym-Jomart Tokayev, announced at a meeting of the National Council on Science and Technology, a decision was made to reorganize M.Kh. Dulaty Taraz Regional University

On its basis, two independent universities were established:

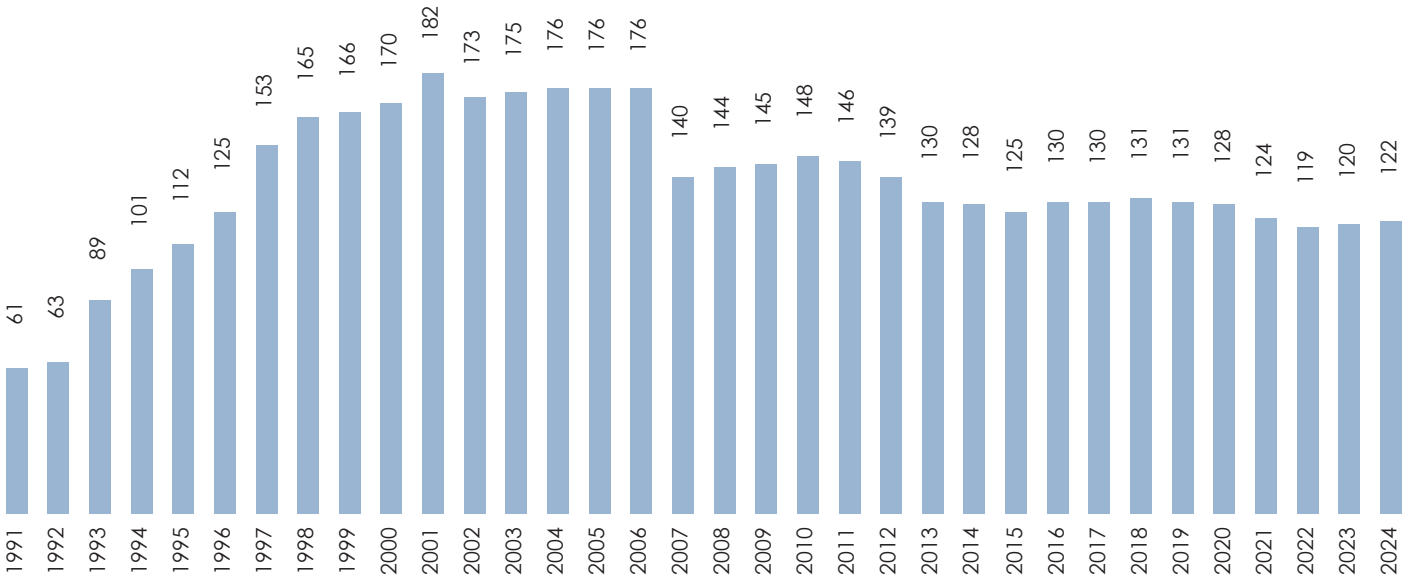
NAO "M.Kh. Dulaty Taraz University"

NAO "Kazakh National University of Water Management and Irrigation" (KazNUWMI).

Both universities were founded with full state participation in their authorized capital, which highlights the priority status of this field and its focus on training highly qualified engineering personnel in an area critically important for the country.

Another significant event was the signing, in August 2024, of a memorandum between the **Ministry of Science and Higher Education of the Republic of Kazakhstan** and Cardiff University on the establishment of a new international research university in Astana.

Figure 3.1.1.
Network of Higher Education Institutions



The project is being implemented with the participation of the British university, one of the leaders in the UK higher education system.

Founded in 1883, Cardiff University has internationally recognized academic and research capacity.

It ranks among the top 25 universities in the UK and is a member of the prestigious Russell Group, which unites the country's leading research universities. Cardiff is a leading institution in fields such as medicine, biology, engineering, and social sciences, with particularly strong research in oncology, cardiology, and related areas.

The new international research university in Astana will focus on programs in priority areas, including **engineering, artificial intelligence, sustainable development, medicine, and biotechnology**. The world-class campus will accommodate up to **2,500 students,** with the first programs scheduled to launch in **2025**.

As of 2024, Kazakhstan's **122 universities** are represented in various organizational and legal forms. The largest share belongs to **private universities – 52 institutions (42.6%)**, reflecting the strong role of the non-state sector in higher education. They are followed by **state universities – 31 institutions (25.4%)** and **non-civil universities (including military and law enforcement) – 14 institutions (11.5%)**. In addition, the system includes **12 national universities (9.8%)**, which hold special status and strategic significance, as well as

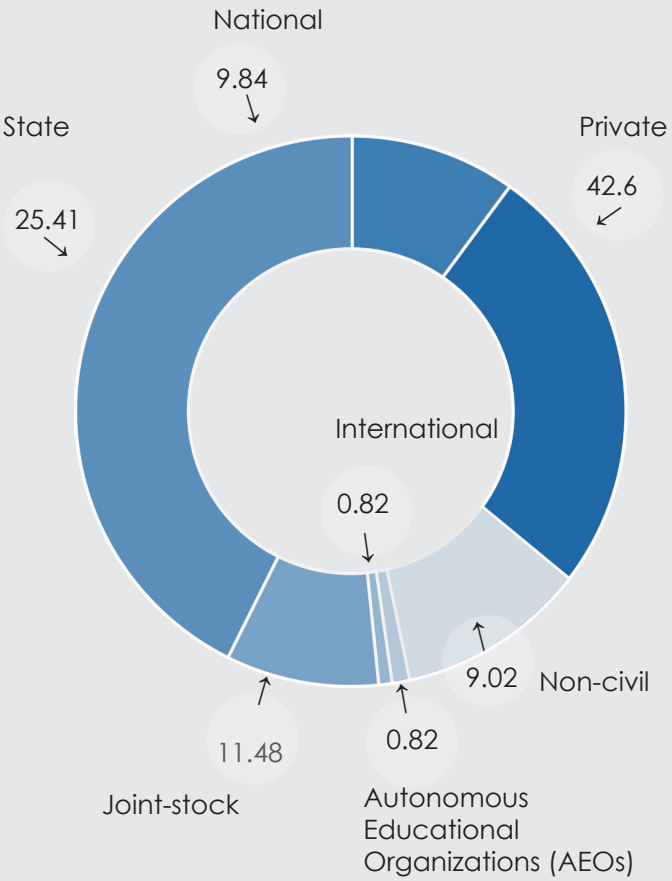
11 joint-stock universities (9.0%) operating under corporate governance principles. Furthermore, the system comprises **one autonomous educational organization** (AEO) and o**ne international university**, underscoring the diversified nature of Kazakhstan's higher education system, oriented both toward meeting sectoral needs and developing international academic partnerships (Figure 3.1.2).

To ensure high-quality education within the network of higher and postgraduate institutions in Kazakhstan, a **National Ranking of Higher and Postgraduate Education Institutions** is being introduced. This ranking serves as a systemic tool for evaluating the effectiveness of universities based on transparent and comparable indicators. It covers key areas of university performance, including academic activity, research, international cooperation, digitalization, graduate employability, and more. Its main purpose is not only to rank universities but also to create an analytical foundation for monitoring and making managerial decisions aimed at improving the quality of education.

The ranking methodology was approved by Order of the Minister of Science and Higher Education of the Republic of Kazakhstan No. 126 of March 26, 2024, and is based on the principles of objectivity, representativeness, and alignment with international standards. The formation of the ranking will be carried out in digital format on the **Unified Higher Education Platform**, integrated with universities' internal systems, state information resources, and international databases. A pilot implementation was provided for by Order No. 536 of November 26, 2024, while the full-scale launch is scheduled for 2025.

It is expected that the introduction of the ranking will not only strengthen competition and motivate universities to improve but also provide access to objective information for applicants, parents, employers, and other stakeholders, thereby shaping a sustainable quality ecosystem in higher education.

Figure 3.1.2.
Distribution of universities by organizational and legal form



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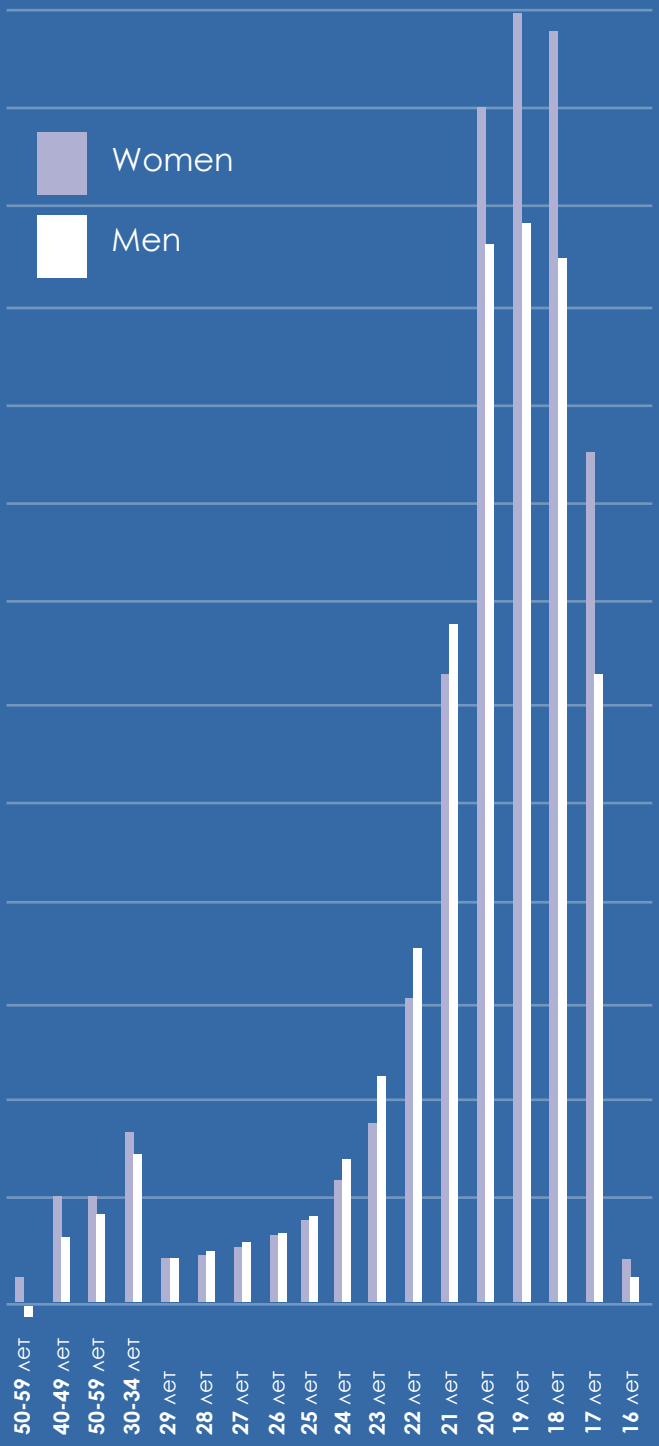
3.2. Student Population:Dynamics and Structure

Figure 3.2.1.
Number of students in postgraduate education by age and gender



Source:
Higher Education in the Republic of Kazakhstan (At the beginning of the 2024–2025 academic year), Bureau of National Statistics, ASPR

In 2024, student admissions amounted to → **206,803** people, of whom↓

Bachelor's degree ↓
183 630 people

Master's degree ↓
16 121 people

Doctoral studies ↓
2 972 people

Residency ↓
4 080 people

including under the state order → **90 880** people, of whom↓

Bachelor's degree ↓
76 588 people

Master's degree ↓
9 354 people

Doctoral studies ↓
2 620 people

Residency ↓
2 318 people

The student body amounted to → **680 156** people, of whom↓

Bachelor's degree ↓

624 469 people

Master's degree ↓

39 172 people

Doctoral studies ↓

7 633 people

Residency ↓

8 882 people

including under the state order → **287 048** people, of whom↓

Bachelor's degree ↓

255 997 people

Master's degree ↓

19 534 people

Doctoral studies ↓

6 370 people

Residency ↓

5 147 people

Figure 3.2.2.
Student enrollment under the state educational grant and on a tuition-paying basis (1998–2024)

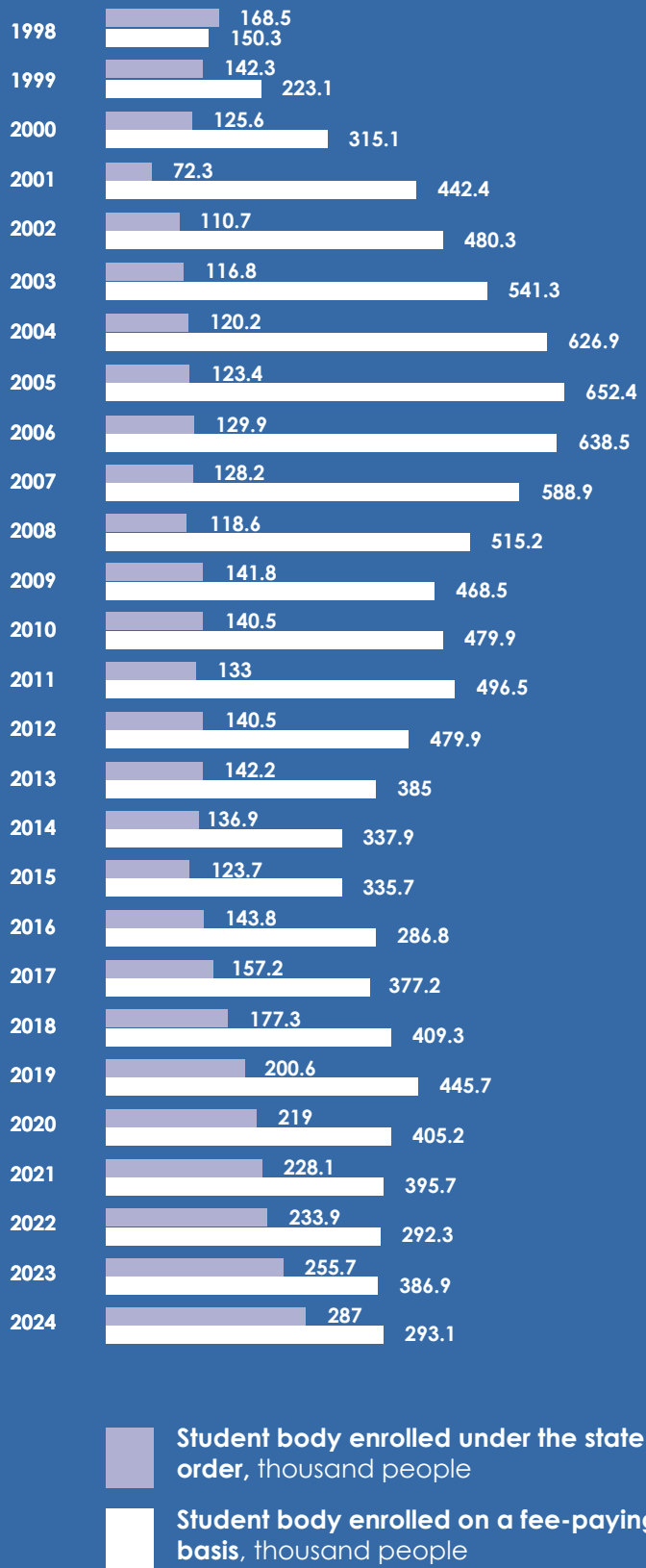
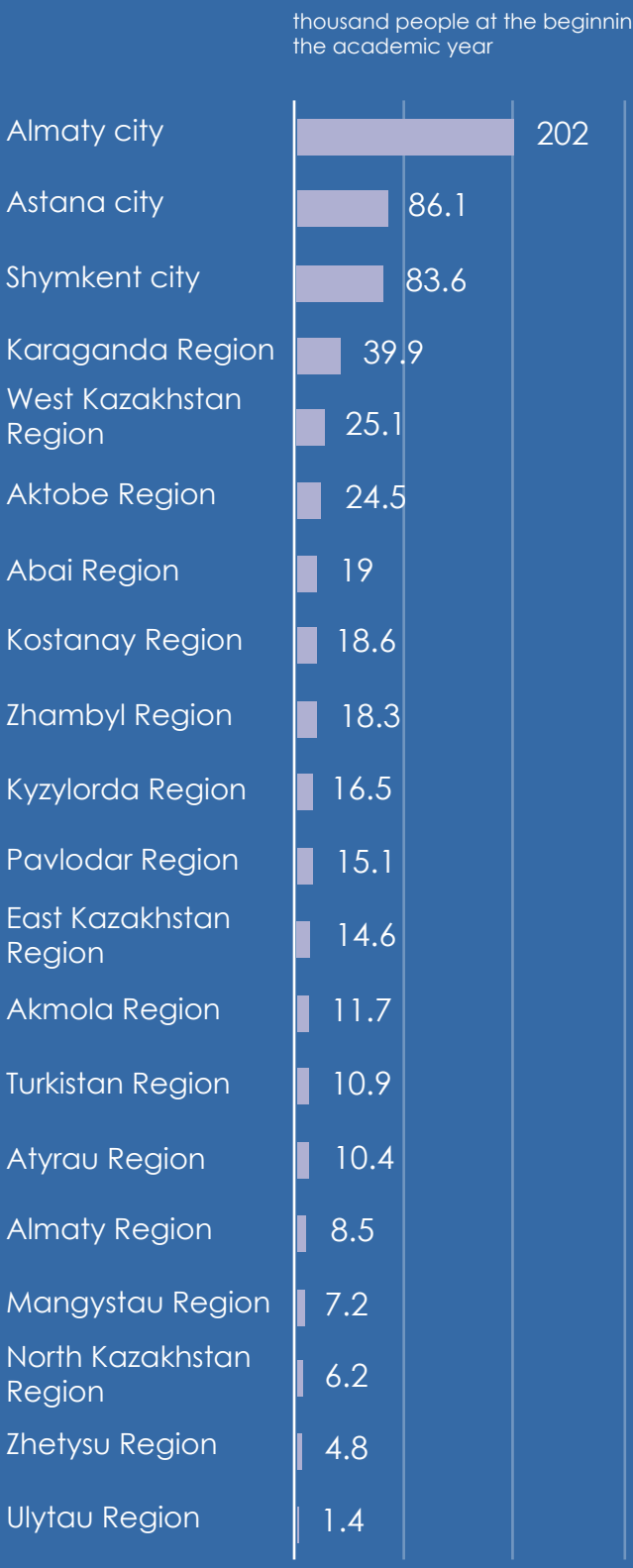


Figure 3.2.3.
Number of Students by Region



Source:
Higher Education in the Republic of Kazakhstan (At the Beginning of the 2024–2025 Academic Year), Bureau of National Statistics, ASPR

The output in 2024 amounted to → **172,699** people, of whom↓

Bachelor's degree ↓ **147 375** people

Master's degree ↓ **21 344** people

Doctoral studies ↓ **1 422** people

Residency ↓ **2 558** people

including those under government orders → **54 499** people, of whom↓

Bachelor's degree ↓ **43 127** people

Master's degree ↓ **8 715** people

Doctoral studies ↓ **1 279** people

Residency ↓ **1 378** people

The number of international students in 2024–2025 amounted to → **30 711** people, of whom↓

Among Kazakhstani students, the majority are young people aged 17–22, reflecting the dominance of the classical trajectory of continuous education after school. The peak enrollment occurs at ages 19 and 20. The gender ratio is balanced across most age groups, with a slight predominance of women among older students and those aged 18–20. There is also a noticeable share of mature learners: students over 30 account for a significant portion of the student body, which reflects the growing interest in lifelong learning, obtaining a second higher education, and professional retraining. This confirms the flexibility of Kazakhstan's higher education system and its adaptation to diverse educational pathways (Figure 3.2.1).

The analysis of the dynamics of student enrollment under the **state educational grant** and **on a tuition-paying basis** makes it possible to trace key transformations in Kazakhstan's higher education financing policy over the past decades (Figure 3.2.2). The structure of higher education financing in Kazakhstan has been gradually shifting from a predominantly tuition-based model to a more **balanced system** with a growing share of state-funded places. This reflects the strengthening of the **social function of the state** and its commitment to increasing access to quality education.

Tuition-based education experienced rapid growth in the early 2000s, reaching its historical peak in **2005 with 652.4 thousand students.**

This surge was driven by the rapid expansion of the private university network and the limited number of state grants, which stimulated a massive influx of students into fee-paying programs. However, starting from **2006–2008**, a steady downward trend emerged, particularly noticeable up to 2016. Several factors contributed to this decline: the demographic downturn of the late 1990s–early 2000s, higher quality requirements for educational programs, a reduction in the number of universities, and the decline in household purchasing power against the backdrop of the **2008 global financial crisis**. After 2017, the number of tuition-paying students stabilized within the range of **377–445 thousand.**

State-funded education, by contrast, shows a more stable and upward trajectory.

Following a decline in state-funded student numbers in the early 2000s (in 2001 – only **72.3 thousand students**), a gradual recovery began. A significant increase has been observed since 2017, when the government, as part of its policy to expand access to higher education, began a large-scale expansion of educational grants.

As a result, while in the **1998–1999 academic year** the number of students studying under the state educational grant amounted to **168.5 thousand**, by **2024–2025**

it had reached **287 thousand,** representing approximately **42% of total enrollment.**

This growth is directly linked to the strengthening of the state's social function and its focus on supporting young people from vulnerable groups, rural areas, and other priority categories.

Under the admission quota in higher education institutions, [they] studied → **82 700** people, of whom↓

individuals from the rural youth population ↓	children from families raising four or more underage children ↓	children from incomplete families ↓
29 400 people	**23 700** people	**11 200** people

To further expand access to higher and postgraduate education, the state order for training personnel has been increased.

Allocated for the 2024–2025 academic year → **94 251** grants↓

Bachelor's degree ↓	**Master's degree ↓**	**Doctoral studies ↓**
78 219 people	**13 113** people	**2 919** people

Based on competition results:

- 412 orphans
- 382 persons with disabilities
- 3 576 children from large families
- 933 children from single-parent families
- 437 children from families raising children with disabilities received grants

In 2024, for the first time following changes to the admissions procedure:

- 1 604 **ethnic Kazakhs** were awarded grants (compared to 804 in 2023)

The largest number of students is registered in **Almaty – 202,000**, making the city the country's primary educational hub. Significantly lower, yet still considerable, numbers are observed in **Astana (86,100)**, where leading universities and branch campuses are concentrated, and in **Shymkent (83,600)** (Figure 3.2.3). These figures confirm that higher education in Kazakhstan is concentrated mainly in cities of national significance and several large regional centers. At the same time, a number of regions demonstrate low student density

To reduce regional imbalances in student distribution and ensure workforce training in areas less covered by higher education, the state program "**Serpin**" has been implemented. This project is aimed at attracting high school graduates from southern and overpopulated regions to study at universities in regions experiencing a shortage of human resources.

The project is carried out across **19 universities in 8 regions** of the country (Akmola, East Kazakhstan, Karaganda, Kostanay, Ulytau, Abai, Pavlodar, North Kazakhstan regions).

Training is conducted primarily in **priority areas**: pedagogy, technical fields, and agriculture. The program provides not only tuition and stipends but also covers **transportation and social support expenses.** The requirement for mandatory employment after graduation is regulated by law and has been adapted to modern conditions: graduates may work in either

public or private organizations, and the mandatory service period has been reduced from three to two years.

Since **2024**, the implementation of the project has been significantly strengthened: roadmaps have been approved, **regional project offices** have been created, and a **central project office** has been established at the National Center for the Development of Higher Education. These offices include representatives of local administrations (akimats), ministries, universities, and employers, thereby enhancing interagency coordination. Among the key tasks are: identifying regional workforce needs, developing **Atlases of Professions,** organizing industrial internships, and facilitating the subsequent employment of graduates.

Thus, the "**Serpin**" program serves as a tool for the spatial rebalancing of human capital, facilitating the integration of educational, demographic, and regional policies. The "Serpin" initiative, and the broader policy of expanding the university network in the regions, represent strategically justified measures aimed at reducing territorial disparities and enhancing regional potential. The presence of higher education institutions in a region is one of the key factors influencing the educational level of the population and the sustainability of socio-economic development.

Empirical studies confirm that regions hosting large universities, especially public ones, generally demonstrate higher levels of human capital [31]. Universities contribute to human capital growth in at least two ways: first, by increasing access to higher education for the local population, thereby raising the likelihood that school graduates will continue their studies [32–33]; and second, by attracting students from other regions, some of whom remain after graduation and strengthen the region's qualified workforce [34–35].

Taken together, this explains why graduate retention has a significant impact on the growth of "smart cities" – territories with a higher level of education and greater attractiveness for living. In this context, the "Serpin" project not only helps to adjust demographic trends by stimulating youth migration from the southern regions, but also enhances the resilience and competitiveness of the host regions through the systematic accumulation of local human capital.

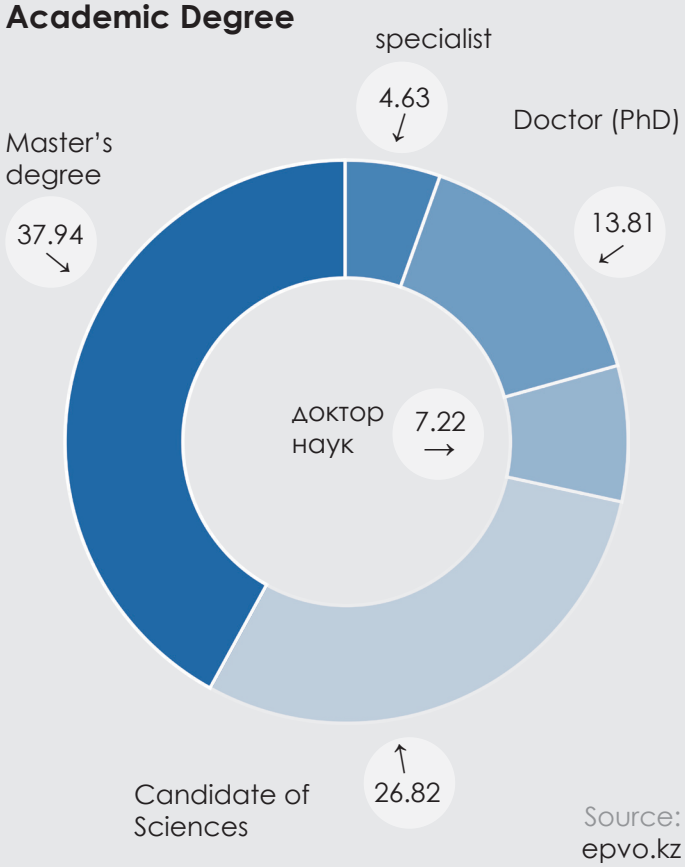
3.3. Faculty Potential of Universities: Quality and Prospects

At the beginning of the 2024–2025 academic year, the number of academic and teaching staff (ATS) in higher education institutions of the Republic of Kazakhstan totaled **37.6 thousand**. Of these, **48%** hold academic degrees: Candidate of Sciences (**26.82%**), Doctor of Sciences (**7.22%**), or PhD (**13.81%**). A further **42.57%** hold a Master's degree (**37.94%**) or Specialist degree (**4.63%**). (Figure 3.3.1.)

The academic staff of Kazakhstan's higher education institutions is distributed by academic titles as follows: the largest category consists of faculty members **without an academic title**, accounting for **65.72%**. Among those holding titles, the most numerous are **Associate Professors (доценты)** at **14.15%**, followed by **Professors** at **9.19%**, and **Associate Professors in two categories** – docent (**7.17%**) and under the new qualification framework (**3.61%**). The share of **Professors under the new qualification framework** is only **0.16%,** indicating the extremely limited spread of this form of academic status.

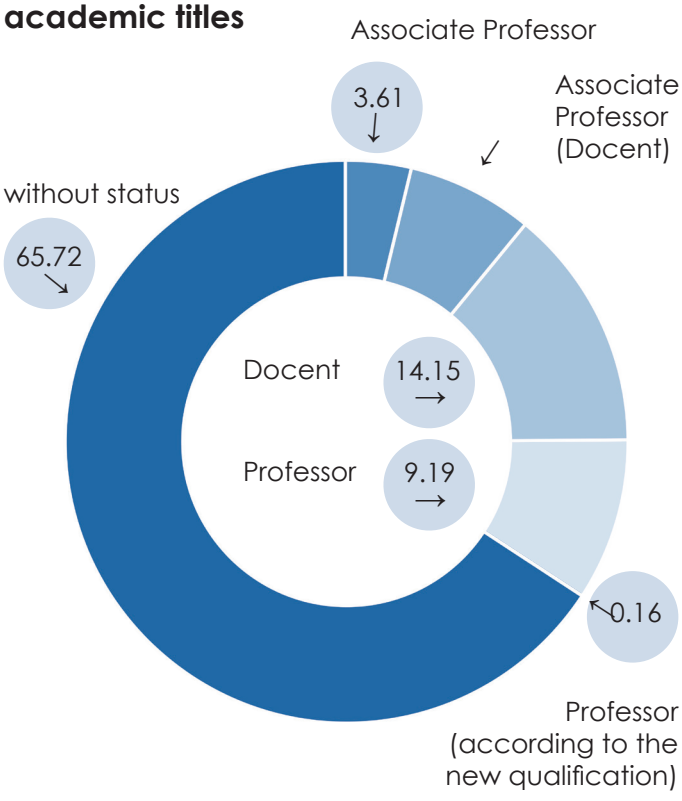
This distribution highlights the **high proportion of faculty without a formalized academic title**, which may reflect both transitional processes in academic staffing and the misalignment of existing criteria

Figure 3.3.1.
Academic and Teaching Staff by Academic Degree



Source: epvo.kz

Рисунок 3.3.2.
Distribution of academic staff in higher education institutions of Kazakhstan by academic titles



Source: epvo.kz

with the academic career trajectories of a significant share of the teaching staff. (Figure 3.3.2).

Among the academic staff of Kazakhstani universities, around **35% hold academic titles**. The most common is the title of **Associate Professor (доцент)**, held by 14.15% of faculty.

The share of **Professors** amounts to **9.19%,** while **Associate Professors under the new qualification framework** account for **3.61%**, and **Associate Professors (docent) – 7.17%.** Professors under the new qualification framework make up only **0.16%.** At the same time, the majority of faculty – **65.72%** – do not hold an academic title (Figure 3.3.2).

To raise the level of scientific qualifications of faculty and expand the human resource potential of the national higher education system, the **Ministry of Science and Higher Education of the Republic of Kazakhstan** implemented a set of measures in the **2024–2025 academic year** to stimulate the training of scientific personnel. In particular, according to Order No. 248 of **November 15, 2023**, the cost of state educational grants was increased: in **master's programs by an average of 16%** (to 747.3 thousand tenge for national universities and 454.9 thousand tenge for other institutions), and in **doctoral programs by 17%**, to **2,223.6 thousand tenge**.

This enables universities to attract more qualified faculty, improve scientific and educational infrastructure, and provide adequate conditions for teaching and research.

In addition, in order to systematically strengthen the scientific and pedagogical reserve, Order No. 309 of June 26, 2024 approved the allocation of 2,919 state grants for doctoral training.

This number is expected to increase: by 2028, the number of doctoral grants is projected to exceed 5,000, creating a sustainable foundation for building a highly qualified academic and research workforce.

Such a policy is aimed not only at increasing the proportion of faculty with advanced degrees in universities but also at fostering the development of research schools, ensuring continuity within the academic community, and strengthening Kazakhstan's position in the international academic space. Systematic investment in the training of PhD specialists represents one of the key elements of the **strategic modernization of higher education and science.**

To provide systematic support for the professional development of academic and teaching staff (ATS), the Ministry of Science and Higher Education of the Republic of Kazakhstan is implementing a number of strategic initiatives aimed at upgrading qualifications, modernizing competencies, and strengthening the academic status of faculty. One of the key steps was the adoption of the **Professional Standard for Teachers of Higher and Postgraduate Education Institutions** (Order No. 591 of November 20, 2023), which clearly structures qualification requirements and career trajectories across six academic ranks. This establishes a foundation for transparent and motivating career progression within the higher education system.

In addition, as part of the state program for the **digital transformation of universities**, faculty at technical universities have undergone specialized training in the integration of digital technologies into

the educational process. These measures help teaching staff adapt to modern requirements, including digital pedagogy and online learning.

Special emphasis is placed on the formation of a sustainable system of professional development. Engineering-focused universities, such as **Satbayev University** and **Kazakh Agrotechnical University named after S. Seifullin**, are developing their own **competence centers**, where regular courses are organized on technical disciplines, modern engineering methods, and higher education pedagogy. Furthermore, cooperation with industrial enterprises is being intensified, with faculty invited to engage in experience-sharing and familiarize themselves with advanced technologies – strengthening the link between education and the real economy.

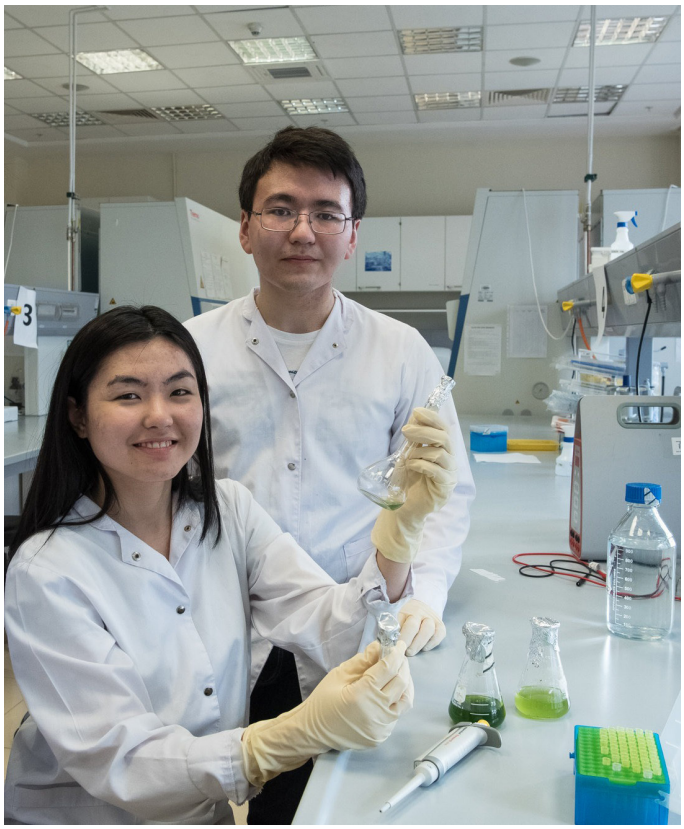
The professional growth of academic staff is also supported through **international academic exchanges.** Universities in Kazakhstan actively collaborate with foreign partners, enabling faculty to participate in internships and professional development courses. For example, the **Institute for Advanced Training at Al-Farabi Kazakh National University** has implemented courses in hydrological disciplines, while faculty from **D. Serikbayev East Kazakhstan Technical University** and **S. Amanzholov East Kazakhstan University** have received training at the National Research **Nuclear University MEPhI (Russia)** in nuclear physics, thermal power engineering, and engineering calculations.

Thus, the measures undertaken form an institutional foundation for strengthening academic capacity and ensuring sustainable growth in the quality of higher education aligned with international standards and technological challenges.

Special attention is also given to creating favorable conditions for the training of research personnel, ensuring social protection guarantees, and expanding social support measures for researchers, including young scientists:

- the amount of supplementary payments to researchers for academic degrees and titles has been increased;
- measures continue to support international internships, the awarding of 50 “Best Researcher” prizes, other science awards, and state research scholarships, including 50 fellowships for talented young scientists.

In line with the instruction of the Head of State, support for young scientists has been significantly strengthened. A landmark event was the provision of housing to **351 young researchers**: 290 apartments through the Ministry’s agreement with Otbasy Bank under a preferential loan program, and 61 apartments granted free of charge.



The **Law of the Republic of Kazakhstan "On Science and Technological Policy"** (hereinafter – the Law) provides for norms on incentives for scientists, researchers in scientific organizations, and higher and postgraduate education institutions, as well as the introduction of **basic funding mechanisms.**

In addition, researchers engaged in scientific work are granted monthly supplements under basic funding, institutional funding of fundamental research, or within approved amounts of grant and program-targeted projects, provided they hold the appropriate diploma or recognized educational qualification:

- PhD / Doctor of Profile – 17 Ч Monthly Calculation Index (MCI);
- PhD / Doctor of Profile + Associate Professor – 25 Ч MCI;
- Candidate of Sciences – 17 Ч MCI, Doctor of Sciences – 34 Ч MCI;
- Candidate of Sciences + Associate Professor – 25 Ч MCI, Doctor of Sciences + Associate Professor – 42 Ч MCI;
- PhD / Doctor of Profile + Professor – 50 Ч MCI;
- Candidate of Sciences + Professor, Doctor of Sciences + Professor – 50 Ч MCI.

To strengthen managerial capacity and ensure leadership succession in higher education, the Ministry of Science and Higher Education of the Republic of Kazakhstan has initiated the creation of a National Personnel Reserve. It is designed to include individuals with substantial professional and academic expertise in science, higher education, and university management, as well as Kazakhstani scholars working abroad and distinguished domestic researchers.

One of the key instruments of this initiative is the "Academic Leadership Institute: Deans' School" program, launched in 2024 at Nazarbayev University and the Khoja Akhmet Yassawi International Kazakh-Turkish University. The program aims to develop leadership and managerial competencies among deans of Kazakhstani universities, forming a highly qualified talent pool for future leadership appointments in higher education.

The approach to building this reserve is based on best practices, including the model of the Presidential Youth Personnel Reserve. Participants trained under this program will subsequently be actively involved in expert and advisory activities, including contributing to the development of strategic documents, evaluating educational programs, and implementing reforms in higher and postgraduate education. This initiative is part of a comprehensive strategy to enhance the quality of university governance and to foster academic leadership in the country.

3.4. Gross Enrollment in Higher Education and Its Accessibility

As of 2023, the gross enrollment rate in higher education in Kazakhstan stands at 54.1%. At the same time, regional differentiation by this indicator remains significant. The highest enrollment rates are observed in major cities – Almaty (106.4%), Astana (92.6%), and Shymkent (102.4%) – driven by the concentration of leading universities (Astana and Almaty), high demand for higher education, and active youth migration to these metropolitan areas. In several regions, especially in the western and southern oblasts, enrollment rates are considerably lower – below 30%: Zhetysu Region – 16.4%, Ulytau Region – 17.8%, and Turkestan Region – 19.3%. These figures highlight the limited accessibility of higher education in certain areas and the outflow of high school graduates (Table 3.4.1).

The gross enrollment ratio in higher education is defined as the ratio of the total number of students, regardless of age, enrolled in TVET institutions (ISCED-5) and higher education institutions (ISCED 6–8), to the total population aged 18–22.

Thus, despite the comparatively high national level of enrollment in higher education, **reducing regional disparities in access** remains a pressing challenge. To address this, the government is implementing targeted programs aimed at redistributing the student population, developing universities in the regions, and encouraging young people to study and remain in areas experiencing shortages of human capital.

Kazakhstan's higher education policy is directed toward ensuring the **widest and most equitable access** to learning opportunities, with the goal of achieving **100% gross enrollment in higher education among youth.** To this end, the state is pursuing systemic and comprehensive measures to expand educational opportunities, eliminate regional and socio-economic barriers, and provide financial support for students.

For example, the **"Serpin" program** not only helps reduce regional disparities in access to education but also contributes to leveling human capital across regions, thereby strengthening the educational and demographic balance of the country.

Moreover, in the **2024–2025 academic year**, in accordance with Order No. 313 of the Ministry of Science and Higher Education of June 24, 2024, 5,000 targeted grants were allocated for the first time to young people from densely populated southern, western, and newly established regions. These places were distributed among the country's leading universities and are intended to reduce **regional disparities in access to quality higher education.**

To further enhance the accessibility of higher education, the Ministry of Science and Higher Education is introducing the **Unified Solidary Educational Savings System "Keleshek"**. This system is based on a mixed co-financing mechanism involving the state, families, and financial institutions. Under the system, a special educational account will be opened for each child, to

Table 3.4.1.
Gross enrollment in higher education by region

Republic of Kazakhstan	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Abai Reg.	37,8	43,1	49,2	50,9	55,6	57,2	55,8	52,5	49,3	49,6	49,5	53,1	53,4	50,9	48,4	51,1	54,3	60,7	67	64,1	62,6	59,1	71,9	54,4
Akmola Reg.																							86,9	79,1
Aktobe Reg.	22	29,9	33,9	36,1	38,9	41,7	38,1	28,5	29,7	29,8	36,4	37,9	51,2	49,8	45,6	47,2	51,2	54,9	63	71	70,5	64,1	55,5	34
Almaty Reg.	48	51,7	57,3	49,9	57	50	52,1	41,1	46,2	48,6	40,5	46,7	51,2	49,8	45,6	47,2	51,2	54,9	63	71	70,5	64,1	55,5	53,8
Atyrau Reg.	7,6	9,3	9,5	10	10,3	10,7	10,7	10,1	10,8	10,8	10,5	11,4	13,4	13,6	14,3	11,7	12,3	12,3	13,6	14,3	13,5	13,6	12,8	12,1
West Kazakhstan Reg.	45,7	52,5	57,4	56,5	58,2	50,8	50,4	50,2	53	54,3	39	40,4	38,3	33,8	34,8	34,1	35,4	39,7	42,6	48,2	39,6	37,9	34,3	33,4
Zhambyl Reg.	36,3	39,1	53,6	57,1	58,8	54	54,6	50,2	52,3	53,9	59,1	70,9	68,6	58,8	67,7	67	78,1	87,5	90,6	96,5	85,3	83,2	78,4	71,9
Zhetysu Reg.	28,4	30,6	37,9	37	42,3	43,4	42,2	35,6	35,9	41,8	46,5	44,4	40,6	32,7	29,6	32,7	35,3	38,3	41,6	44,2	43,3	38,2	33,5	29,6
Karaganda Reg.																						18,7	16,4	16,4
Kostanay Reg.	49,7	55,9	59,9	60,6	65,8	58,3	55	49,9	52,8	61,7	65	62	58,5	58,5	56,9	55,4	56,5	61,1	68	68,9	66	64,9	71,4	66,4
Kyzylorda Reg.	27,3	34,7	44,3	47,4	51,9	53	48,8	45	45	45,3	45,3	48,2	41,2	41,2	40,6	40,9	45,6	48,5	52	53,5	49,8	46,5	45,1	44,1
Mangystau Reg.	30,3	32,7	35	32,9	33,8	33,1	30,7	33,7	33,9	31,8	38,5	38,2	37,8	30,8	26,6	25,3	26	25,9	28,7	29,4	28	31,4	37,3	36,3
Pavlodar Reg.	32,3	44,5	38,6	59,2	56,2	44	44,4	34,5	36,1	35,6	34,7	35,9	32,4	31,2	22,3	23,1	25	24,8	27,3	33,6	26,5	23,2	23,5	21
North Kazakhstan Reg.	27	37,4	48,9	43,6	52	56,3	43,3	43,3	44,1	42,2	46,8	49,9	49,4	46,5	42	39,8	46,3	47,4	52,8	56,2	58,4	56,1	50,1	45,2
Turkistan Reg.	21,8	29,1	30,3	31,1	32,2	34,1	27,9	28,2	28,2	28,4	34,9	33,8	30,4	24,9	23	21,8	24,8	25,2	31	32	32,2	29,8	29,1	26,5
Ulytau Reg.	28,2	33,5	43,5	44,8	48,9	46,1	43,6	40	39,4	37,8	37,8	42,1	42,7	40,3	39,3	40,1	41,1	45,3	12,3	13,3	12,8	12,9	10,6	17,3
East Kazakhstan Reg.																						18,9	17,7	18,7
Astana city	31,9	35,5	39,1	42	47	44,4	45,1	44,5	46,5	49,7	51,9	51,3	43,3	43,3	42,6	45,3	50	50,5	57,3	57,1	58,7	59,3	61,1	50,7
Almaty city	49	48	57,1	66,5	73,4	104,1	104,9	101,9	95,2	63,3	74,4	91	108	116,3	91	90,8	99,8	106,9	114,3	116,3	118,8	99,6	90,8	90,8
Shymkent city	113	125,6	139	150,3	166,5	173,8	172,1	156,1	158,6	121,4	124,2	131,8	136,4	124,5	124,5	120,7	152,6	133,3	124,4	122,6	124,4	122,6	127,9	122,1
																			120.7	152.6	133.3	124,6	122,6	106,4

which the state will make a **one-time initial contribution of 60 MCI (monthly calculation indices)**. Parents will be able to contribute monthly from **1 to 3 MCI**, thereby building savings for future educational expenses.

The savings on these accounts will be placed in second-tier banks, ensuring a **guaranteed investment return of no less than 8% per annum.** In addition, the state will provide an **annual bonus of 5% of the accumulated savings (7% for children from socially vulnerable groups)**, further incentivizing participation in the program. Upon reaching the target amount (approximately **7.5 million KZT plus $3,500 from the National Fund)**, graduates will be able to independently finance their studies at a university or college. If the accumulated funds are insufficient, the system provides for the possibility of obtaining a **preferential educational loan** or a **differentiated grant**, thus making higher education financially affordable for the majority of families.

TTIn **2024**, a pilot project was launched for the first time to provide **state educational loans** for the payment of higher education. The state educational loan will be awarded in accordance with the Rules approved by the Acting Minister of Science and Higher Education of the Republic of Kazakhstan on **April 3, 2024 (Order No. 141)** to applicants meeting the following criteria:

- Holders of an educational grant with **partial tuition coverage** at higher education institutions (HEIs) in the Republic of Kazakhstan under higher education programs;
- Applicants who provide a **guarantee** from at least one employable citizen of the Republic of Kazakhstan with a permanent source of income. This requirement does not apply to borrowers from among orphans and children left without parental care;
- Applicants who have a registered **educational savings deposit agreement** or an **educational savings insurance contract** with total accumulated savings of at least **10% of the total cost of educational services** for the entire period of study at the HEI.

The state educational loan is issued **interest-free**, in **tenge**, for a period of ten years, and in non-cash form. Repayment by the borrower begins in the month following the disbursement of funds from the account of the Operator of the state educational loan.

The **Operator** (executive body) for this program is the **Financial Center JSC** of the Ministry of Science and Higher Education of the Republic of Kazakhstan.

Taken together, the measures being implemented – the increase in the number of grants, the launch of educational loans, and the introduction of the **Keleshek** savings system – form a sustainable model of higher education accessibility. This approach allows the state to consistently expand youth participation in higher education and to ensure equal opportunities for admission regardless of social status.

CONCLUSIONS

В системе высшего образования РК
The higher education system of the Republic of Kazakhstan is experiencing progressive development, reflected in the steady growth of the student body, the diversification of financing mechanisms, the institutional renewal of universities, and the comprehensive support of academic staff.

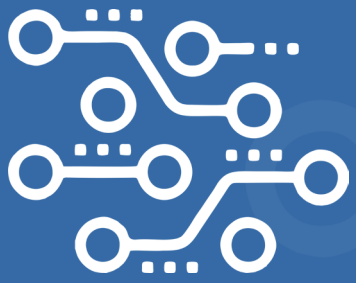
The total number of students is steadily increasing, which is explained not only by demographic growth but also by active state policy to expand access to higher education. Each year, the volume of state educational grants grows, including targeted grants, thereby ensuring a more equitable distribution of educational opportunities.

In parallel with the expansion of access, the institutional capacity of higher education is also growing. Despite the overall stable number of universities, the system demonstrates flexibility in responding to the challenges of the time: new universities are being opened, including those of international format. At the same time, restructuring of existing institutions is taking place – for example, the restoration of the Kazakh National University of Water Resources and Irrigation. These steps highlight the strategic focus on the creation of specialized centers for workforce training, tailored to the needs of the economy and regional development.

Special attention is devoted to the quality of training, which is inseparable from the improvement of the status and working conditions of the faculty. The introduction of a professional standard for teaching staff, the opening of career tracks, the support of scientific activity, and the increase of stipends for doctoral and master's students are all components of a unified policy to develop human capital within the higher education system itself. National and international professional development programs are being expanded, project offices are being created, and leadership pools are being formed – serving as mechanisms to prepare a new generation of leaders in university management.

An important vector is the **increase in gross enrollment in higher** education, which is directly aligned with the goals of sustainable development and Kazakhstan's modernization agenda. To this end, new financial instruments are being introduced, such as **state educational loans** and the "**Keleshek**" system, designed to create educational savings with the participation of the state, parents, and banks. This approach helps distribute the fiscal burden, strengthen the financial sustainability of the system, and, in the long term, achieve **100% higher education enrollment among youth.**

Thus, the student population in Kazakhstan is not only **expanding quantitatively** but also **transforming qualitatively** as a result of the state's systemic and multi-component policy. A balanced combination of accessibility, quality, institutional flexibility, and human resource support is shaping a modern, competitive higher education system capable of meeting both the country's internal needs and international challenges.

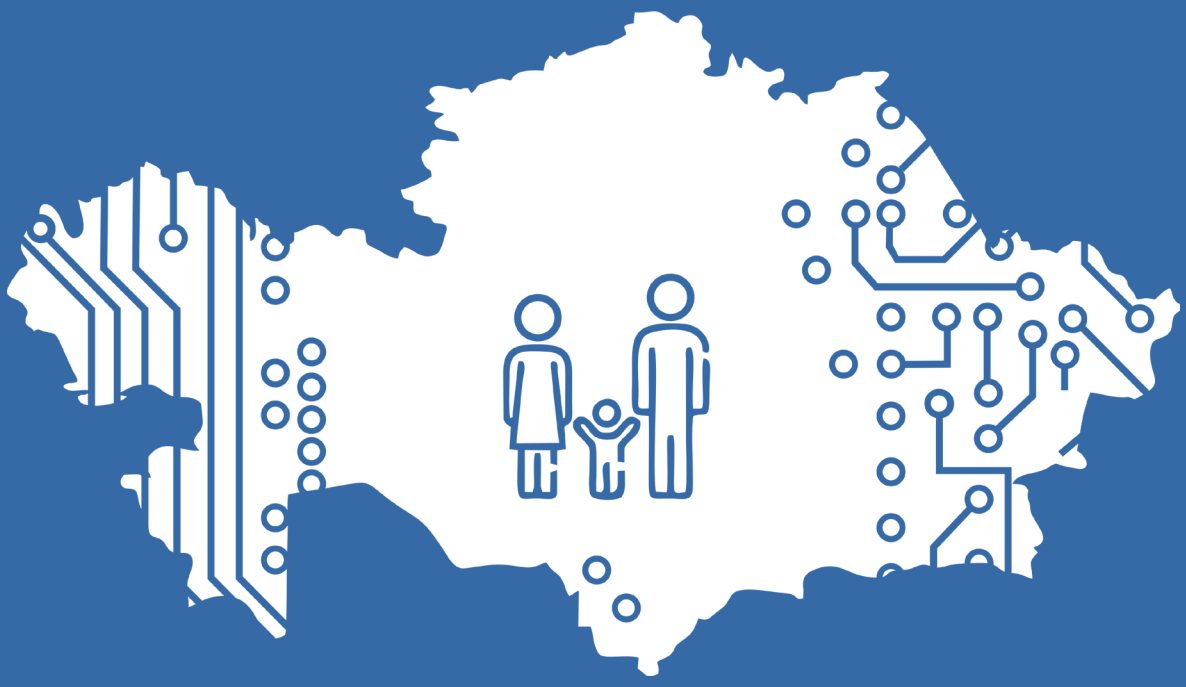


Chapter 4.

Digitalization of Higher Education in Kazakhstan

In 2024, Kazakhstan's higher education system continued its path of profound digital transformation, aligning with the demands of the Fourth Industrial Revolution (Industry 4.0) while laying the foundations for the emerging paradigm of Industry 5.0. Digitalization has become an integral part of the human capital development strategy, designed to prepare graduates for a rapidly changing global labor market.

The key priorities included the integration of artificial intelligence (AI) technologies into educational processes, the expansion of large-scale online learning, and the creation of conditions for advancing the state language in the digital environment. These interconnected directions not only enhance the quality and accessibility of education but also safeguard cultural identity in the digital age.



4.1. **Preparing Talent for the Digital Economy:** Integrating AI into Educational Processes

Цифровая стратегия и роль ИИ

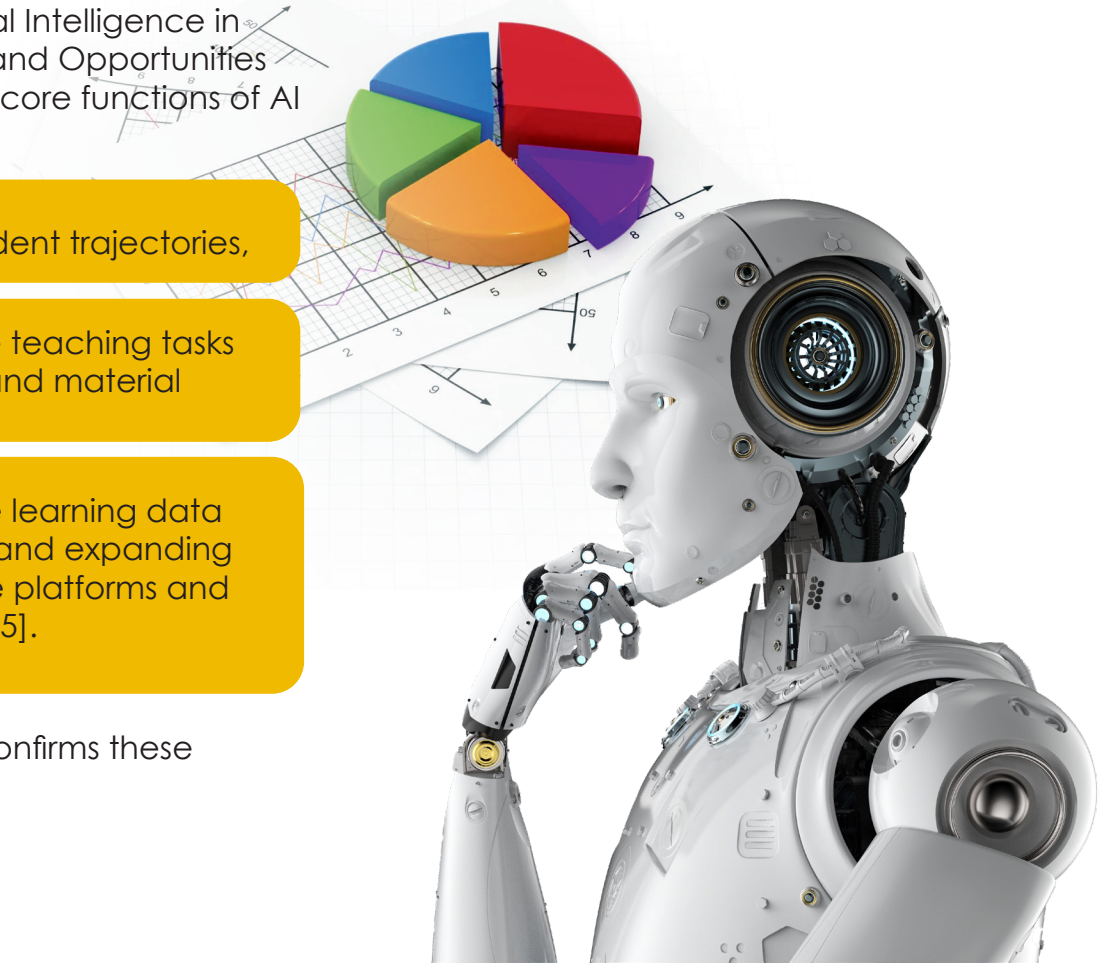
Digital strategy and the role of AI. The modern economy requires universities to train specialists for the professions of the future–many of which are still emerging. According to the Future of Jobs Report of the World Economic Forum (2023), by 2030, 85% of jobs will be transformed by technology, and 50% of workers will need reskilling. Against this backdrop, the integration of AI into education has become a strategic global priority [34].

For example,

the National University of Singapore has introduced an AI-Tutoring system that supports students throughout their learning journey [36], while Stanford University and MIT employ adaptive online courses and data analytics to design curricula [37]. The shift toward the human-centric model of Industry 5.0 emphasizes the balance between automation and human creativity–within education, this means freeing educators from technical routines to focus on mentorship and the development of students' "soft" skills.

The OECD report Artificial Intelligence in Education: Challenges and Opportunities (2023) highlights several core functions of AI in learning:

- personalization of student trajectories,
- automation of routine teaching tasks (such as assessment and material preparation),
- analysis of large-scale learning data to improve curricula, and expanding access through online platforms and intelligent assistants [35].



International practice confirms these trends.

Kazakhstan's national course on digitalization.

For Kazakhstan, digitalization of higher education has become a key component of long-term human capital development policy. Countries that have implemented systemic approaches in this sphere are already seeing benefits, including higher productivity of graduates, greater flexibility of educational programs, and stronger international partnerships. In 2024, Kazakhstan moved from the stage of building basic IT infrastructure to the stage of comprehensive integration of digital tools and AI. The digital environment of universities is no longer viewed as a set of isolated IT projects, but as a coherent policy framework aimed at:

- Ensuring equal access to quality education for all student groups, including those with special needs
- Enhancing the global competitiveness of graduates
- Accelerating universities' adaptation to economic requirements

A key driver of this process has been the directives of the President of Kazakhstan, which outlined tasks such as introducing AI, localizing the world's best online courses into the Kazakh language, expanding international partnerships, and improving the digital literacy of academic staff. These priorities shaped the content of digital transformation in universities in 2024.

Unified digital platform and electronic services.

The central element of this transformation is the Unified Higher Education Platform (EPVO), which is integrated with national databases (eGov, Smart Data Ukimet, and others). It consolidates data on students, graduates, and faculty across all universities. As of October 2024, the platform contained records on 668,000 students and 2.4 million graduates. The creation of a centralized data repository has automated many processes and increased transparency in the governance of the education system [38].

Key achievements of digitalization in 2024 include

Introduction of digital documents.

Student IDs and diplomas became available in electronic format through popular applications (eGov, Kaspi, etc.), simplifying access and use.

Automation of student services.

Processes for submitting applications, enrollment, dormitory allocation, and scholarship assignments were moved online and integrated into EPVO, accelerating student services and reducing corruption risks.

Development of EPVO.

In 2024, the platform was enhanced with new modules–Accreditation, diploma number generation, and HEI Passport (a unified profile of higher and postgraduate institutions) – alongside improved risk management and scholarship financing systems.

In total, EPVO has achieved 14 integrations with key national information systems, advancing end-to-end digitalization of the higher education sector.

All these measures are designed to create a unified information ecosystem in which data on a student's trajectory–from admission to graduation–are available in real time for analysis and decision-making. Based on information collected from universities, the Ministry of Science and Higher Education can now promptly monitor indicators of access and quality, identify problem areas, and provide targeted support.

University IT infrastructure

Progress in digitalization depends heavily on the technical capacity of universities. A 2024 survey of institutional infrastructure revealed the following trends:

Network connectivity

Over 90% of Kazakhstani universities have fiber-optic internet and full Wi-Fi coverage in academic buildings. The average connection speed is 800–900 Mbps, with 500 Mbps being the most common standard. However, these averages mask significant disparities: leading national and technical universities achieve bandwidths of 1–5 Gbps, while some regional universities are limited to less than 100 Mbps. Persistent issues also remain with unstable connections in student dormitories and remote branches, which hampers full access to online resources. This digital divide between the center and the regions remains a challenge requiring coordinated national solutions (further discussed in the "Conclusions" section).

Computing capacity and data storage

Around 80% of universities use cloud storage, valuing its flexibility and scalability. At the same time, only 60% of institutions maintain their own data centers. This reflects both financial constraints and a preference for optimizing costs through outsourcing IT infrastructure. Looking ahead, it will be important to strike a balance between local computing resources (essential for research and AI tasks) and cloud-based services

Cybersecurity

Basic security measures are in place almost everywhere: regular data backups are conducted, and antivirus software is installed. About half of universities have introduced two-factor authentication for faculty and student access systems. However, advanced information security solutions–such as SIEM (Security Information and Event Management) for incident monitoring, DLP (Data Loss Prevention) for data leakage control, and IDS/IPS (Intrusion Detection/Prevention Systems) for network attack mitigation–are still rare. With the growing number of cyberattacks, this limited level of protection creates risks for the stability of educational processes. Universities will need to strengthen their cybersecurity expertise and invest in more robust systems.

Digital educational platforms.

In recent years, universities have developed a diverse landscape of electronic platforms and services to support learning:

Learning Management Systems (LMS)

The dominant system on the market remains Platonus, used by the majority of universities. At the same time, nearly half of institutions complement it with other solutions: open-source platforms (Moodle), international systems (Canvas), or proprietary developments (e.g., Abai Digital, Smart Zhetysu). This hybrid architecture enables universities to combine standardized functionality (needed for student record management and basic e-learning) with more flexible tools for creating customized content. The trend toward using multiple LMS platforms reflects universities' desire to avoid dependence on a single provider while improving the quality of online courses.

Communication tools

Communication tools. For online lectures and meetings, 80–85% of universities rely on Microsoft Teams, Zoom, and Google Meet. At the same time, instant messengers such as WhatsApp and Telegram are widely used (in more than 70% of universities) for notifications and informal communication. This demonstrates that digital communication culture in academia extends beyond formal platforms and integrates familiar everyday applications.

Proctoring and academic integrity

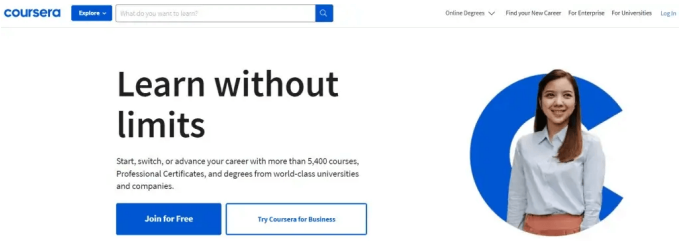
Following the pandemic, most universities introduced proctoring systems for online knowledge assessment. A variety of solutions are in use: domestic (AeroExam, OctoProctor, Platonus Proctoring) and international (Examus, Verigram, ProctorEdu). However, there are still no unified standards: some universities employ continuous video surveillance, while others conduct selective checks of recorded exam sessions. In addition, plagiarism-detection systems have become mandatory across all universities. The most widely used include StrikePlagiarism, Antiplagiat.ru, Turnitin, and Oysyn, with some institutions applying two or three systems simultaneously for multi-layered verification. This strengthens the reliability of assessment and fosters a culture of academic ethics among students.

International projects and partnerships

The year 2024 was marked by the implementation of large-scale initiatives that integrated Kazakhstan's higher education into the global digital ecosystem. Among the most significant were:

The Coursera project.

The national program to expand access to the Coursera platform (launched under the directive of the President) entered a new phase. In 2024, ninety-three universities received 40,000 free licenses, enabling tens of thousands of students to pursue online training in high-demand areas of the digital economy. As a result, more than 23,700 course completion certificates were awarded over the year. A key element of this initiative was content localization: under the Coursera in Kazakh project, 102 of the world's leading online courses were professionally translated into Kazakh and Russian, while more than 4,000 courses were made available with automatic Kazakh translation. This broadened access for students who prefer to study in their native language and significantly enriched the Kazakh-language academic vocabulary (adding approximately 9,000 new terms). This initiative is examined in greater detail in Section 4.2 on massive online education.



Partnerships with global IT companies.

To transfer advanced knowledge and technologies to the national level, universities expanded their cooperation with leading technology firms. In 2024:

The **Huawei ICT Academy** network was expanded to 40 academies (with 7 new academies launched during the year), producing 100 certified trainers and more than 1,000 students earning international Huawei certificates.

2

Google!

With support from Google, 15 universities introduced courses on generative AI (GenAI), enrolling 5,000 students.

Through cooperation with NVIDIA, the Deep Learning Institute initiative was launched: 12 universities gained access to **NVIDIA DLI courses** on AI, 12 faculty members completed internships, and two received recognition as trainer-ambassadors.

In collaboration with **Binance Kazakhstan**, the Crypto School program was launched in 4 universities, reaching 1,000 students and aimed at strengthening competencies in blockchain technologies and financial literacy.

These partnership projects reflect the growing openness of Kazakhstan's higher education system to external innovations. Universities are increasingly leveraging the resources and expertise of global companies, enabling them to update curricula quickly in line with labor market demands. Moreover, such collaborations raise the international visibility of Kazakhstani universities, creating opportunities for bilateral internships and joint research. Section 4.2 further explores the development of massive online education and the partnership ecosystem, which represents a logical continuation of these initiatives.

Integration of AI into educational programs

In line with the directive of the Head of State, developing talent for the digital economy has been designated a national priority, and universities have launched a network of new AI-focused academic programs. In 2024, twenty universities developed twenty-one undergraduate and graduate programs, including Applied Artificial Intelligence, AI and Blockchain Engineering, AI in Medicine, Smart Technologies and AI in Transport Engineering, Computer Science and AI, among others. Doctoral programs have also been introduced in areas such as Cybernetics and AI and AI Technologies.

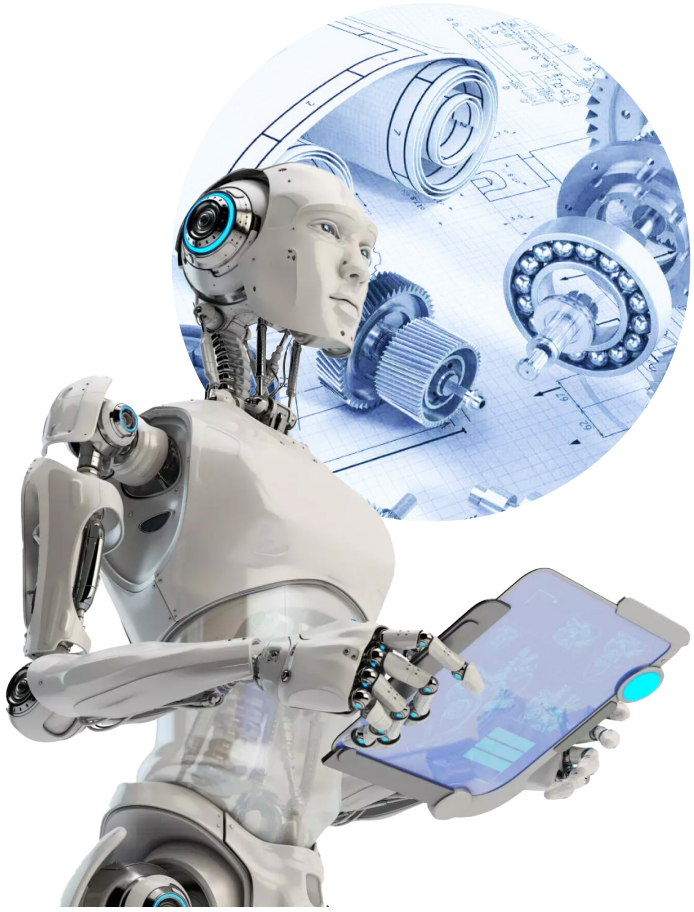
The total number of students enrolled in the new programs amounts to → approximately 2,200 people↓

As early as 2025, the labor market will see its first cohorts of graduates equipped with competencies directly aligned with AI technologies. Curricula for these programs emphasize advanced training in programming (Python), machine learning libraries (TensorFlow, Keras, PyTorch), data analysis and visualization (Pandas,

NumPy, Matplotlib), natural language processing (NLP), big data management (SQL/NoSQL), and the development and deployment of neural network solutions. This forms the foundation for meeting the growing demand for AI specialists across diverse sectors–from IT to medicine and industry.

International academic cooperation in AI

Kazakhstan's universities are actively engaging global expertise to strengthen competencies in AI. In 2024, a Graduate School of AI and Informatics was established at Korkyt Ata Kyzylorda University in partnership with Seoul National University of Science and Technology. Satbayev University launched a branch of City University of Hong Kong, offering dual-degree programs in artificial intelligence.



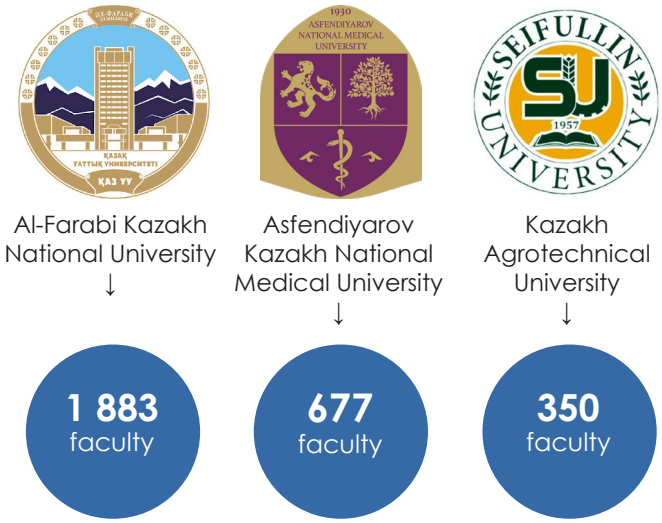
At D. Serikbayev East Kazakhstan Technical University (Ұskemen), a Center for Artificial Intelligence was created in collaboration with the Chinese "Luban Workshop" initiative. In December 2024, the same university inaugurated an International Research Center on AI and a Smart Driving Technologies Engineering Center for applying AI in the transport sector.

From the new academic year, EKSTU also began implementing the innovative program **Smart Technologies** and **AI in Transport Engineering**, enrolling its first cohort of 24 students (including 18 on state grants). These examples demonstrate that AI training is no longer concentrated only in the capital's universities: regional institutions, leveraging international partnerships, are increasingly emerging as centers of excellence in advanced technological fields.

Faculty upskilling

A critical condition for successful digitalization is the readiness of faculty to adopt new technologies and teaching methods. In 2024, large-scale efforts were undertaken to train academic staff in AI skills and modern pedagogical approaches.

Thirty-six universities–including Korkyt Ata Kyzylorda University, KBTU, the International University of Information Technology, Astana IT University, A. Baitursynov Kostanay University, among others–organized seminars and courses for their faculty on applying AI in education. The training covered both general topics (Introduction to AI and GPT in Education) and applied skills (Using ChatGPT and Neural Networks in Teaching, AI in the Work of the Modern Educator, Fundamentals of AI: From Theory to Practice).



The scale of retraining at leading universities was substantial:

However, in some regional universities the number of trained staff did not exceed 30, underscoring disparities in access to professional development. To address this imbalance at the national level, special programs for faculty upskilling in EdTech and AI are planned (see "Conclusions" section).

Special mention: training program for university leaders. In summer 2024, the Ministry of Science and Higher Education, together with Coursera, launched the course Generative AI for University Leaders. Within two months, 959 participants–including rectors, vice-rectors, deans, and department heads from across the country–successfully completed the program.

The course was designed with a strategic focus: how generative models (such as ChatGPT) are reshaping university operations and labor markets, and how AI tools can be integrated into educational management. The large-scale participation of top university managers underscores the importance of the topic: leaders are seeking to understand AI technologies firsthand in order to effectively embed them in teaching, learning, and research.

The AI-Sana National Program

At the end of 2024, Kazakhstan took a major step forward in developing AI competencies by launching AI-Sana, a national accelerator for students and young researchers.

Initiated on December 11, 2024, by presidential directive, the program aims to prepare, within several years, a new generation of specialists proficient in AI and technological entrepreneurship.

AI-Sana is focused on priority economic sectors–energy, sustainable development, agro-industrial complex, education, and talent development–and is designed to provide participants not only with theoretical knowledge but also with the skills to launch innovative projects. The program addresses pressing challenges such as the lack of practical skills among graduates, weak coordination between universities and business incubators, and the limited commercialization potential of student projects.

Structure and scale of AI-Sana

During the preparatory phase, the program aims to reach up to 650,000 students nationwide. Already in 2024, AI-Sana issued 360,280 certificates to participants of online courses on AI fundamentals and

related skills. The distribution of certifications by source illustrates the breadth of engagement:

250,229 certificates ↓

were earned by students through localized Huawei courses (including 174,652 in Kazakh) delivered via a network of 48 Huawei ICT Academies

103,113 certificates ↓

were awarded for the Fundamentals of AI: ChatGPT course developed by Astana Hub, focused on generative AI

47,127 certificates ↓

were issued for AI-related Coursera courses, such as Generative AI for All and Prompt Engineering for ChatGPT

35,388 certificates ↓

were obtained through proprietary online courses developed by Kazakhstani universities.

These figures demonstrate the extraordinary interest of students in artificial intelligence. The AI-Sana project is structured in several stages:

Stage 1 (2025): ↓

development of educational and methodological resources on AI and entrepreneurship

Stage 2 (100,000 students): ↓

acquisition of practical skills and application of design thinking

Stage 3 (60,000 students): ↓

creation of student-led AI projects

Stage 4: ↓

acceleration of 1,500 of the best ideas to the MVP (minimum viable product) stage

This phased approach ensures a gradual progression–from mass online training in fundamental knowledge, to collaborative project work, to entrepreneurial implementation [39].

International expertise and AI-Sana infrastructure.

The program draws on contributions from world-class experts, including Paul Kim (former CTO and Dean of Stanford University) and specialists from Imperial College London, King's College, the Royal Academy of Engineering, and others, ensuring that the curriculum aligns with global best practices. To support practical AI training modules, Kazakhstan's universities substantially strengthened their infrastructure in 2024 by creating a joint Academic Supercomputing Cluster, bringing together high-performance systems from three leading universities:

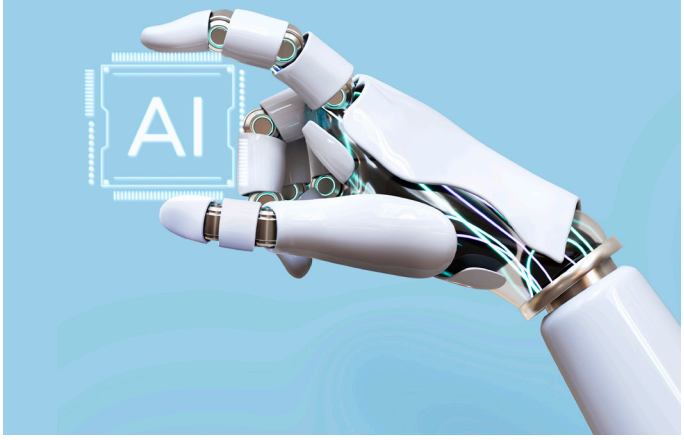
SATBAYEV UNIVERSITY **supercomputer**, with a peak performance of 10.9 trillion operations per second, used for tasks in computer vision, cryptography, and more

EURASIAN NATIONAL UNIVERSITY The upgraded PARAM BILIM **supercomputer** at L.N. Gumilyov Eurasian National

University, with a capacity of up to 100 trillion operations per second, supporting projects such as sign language recognition and analysis of the Kazakh language corpus;

A new **supercomputer** at Al-Farabi Kazakh National University, delivered in 2024 by a Chinese partner, with a peak performance of 1.94 petaflops, designed for scientific computing and modeling.

Together, this academic cluster reaches a combined capacity of approximately 2 PFLOPS (quadrillion operations per second), enabling parallel execution of hundreds of resource-intensive tasks in machine learning, big data, and numerical modeling. The cluster serves as the technological backbone of AI-Sana: it processes the large datasets generated during student projects, supports real-time training and testing of AI models, and provides both students and faculty with direct access to supercomputing power for research. Integrating such advanced infrastructure into education elevates Kazakhstan's IT training to the global level, combining theory with hands-on practice on world-class computational resources.



4.2. Massive Online Education and Digital Learning Ecosystems

The strategic importance of MOOCs.

Over the past decade, Massive Open Online Courses (MOOCs) have evolved from an experimental tool into an integral component of the global education system. MOOCs provide new opportunities: the rapid dissemination of advanced knowledge, scalable training without geographic limits, and flexible acquisition of micro-qualifications. If online courses were once viewed as supplementary resources, today leading universities integrate them into formal curricula, award credits for completion, and collaborate with major technology companies to design specialized courses tailored to labor market demands. In Kazakhstan, MOOCs are seen as part of the modernization of the education and science system.

The state aims to use them to eliminate shortages of

- IT and engineering skills,
- ensure equal access for students in regional and metropolitan universities to modern programs,
- accelerate faculty retraining through global content,
- strengthen partnerships with international technology leaders.

Political will in this sphere was outlined in the President's 2023 Address, which emphasized the importance of collaboration with global IT companies and preparing a new generation of talent.

In 2024, these directives were put into practice:

Google
NVIDIA
HUAWEI
BINANCE
astana hub

Kazakhstani universities became deeply engaged in international online initiatives with Google, NVIDIA, Huawei, Binance, Astana Hub, and other partners, reaching thousands of students and hundreds of faculty members.

Massive online education has thus become an organic part of the national higher education digitalization agenda, complementing efforts to implement AI (Section 4.1) and promote the state language (Section 4.3).

The evolution of Kazakhstan's MOOC ecosystem. From 2015 to 2024, Kazakhstan developed a multi-layered MOOC infrastructure integrated into university operations. Its evolution can be divided into several stages:

1 Initial stage
(2015– 2019)

Early online courses were developed by university enthusiasts and hosted on local platforms (often LMS modules). They were mostly theoretical and informational, with no formal academic credit. The primary focus was digitizing traditional course materials.

2 National infrastructure formation
(2020–2021)

The COVID-19 pandemic acted as a catalyst, accelerating MOOC adoption. National and institutional platforms emerged:

- **Open KazNU** – an Al-Farabi KazNU platform built on Open edX, offering courses for students and faculty, including a molecular biology course ranked in Coursera's global top-100.
- **moocs.kz** – an integrative national portal aggregating online courses from leading Kazakhstani universities into a single repository.
- **ENU MOOC** – a platform at L.N. Gumilyov ENU with courses in humanities, technical fields, and digital skills.
- Other university platforms (e.g., Astana Medical University, Satbayev University) offering online courses in their specializations.

This infrastructure ensured educational continuity during lockdowns and fostered a culture of distance learning.

3 Integration of global platforms
(2020–2022)

Students and faculty gained access to courses on Coursera, edX, Udemy, FutureLearn, LinkedIn Learning, and others. Through Coursera for Campus, dozens of Kazakhstani universities provided free premium access to world-class courses. The most in-demand fields aligned with global trends: data science and AI, digital marketing, project management, and English. This rapidly elevated student training in disciplines new to Kazakhstan.

4 Shift to partnership-based programs
(from 2022)

MOOCs transitioned from being solely external resources to becoming integrated into co-designed programs with global tech companies, tailored to the needs of specific sectors.

In 2024, major projects included:

- **Google GenAI** – Fundamentals of generative AI taught at 15 universities, with 5,000 students completing practical courses with video lectures and assignments.
- **NVIDIA DLI Ambassador** – Faculty training in accelerated computing and AI at 12 universities; 12 faculty members completed the program, two of whom became certified trainers.
- **Huawei ICT Academy** – A network of 40 academies (with 3 new Kazakh-language localized courses), producing 100 certified trainers, 1,000 students with international Huawei certificates, and more than 6,000 participants in Huawei competitions.

Binance Crypto School – At 4 universities, 1,000 students studied blockchain, cryptocurrency, DeFi, and Web3, receiving NFT certificates.

Astana Hub TechOrda – Reached 47 universities and 700 faculty, incorporating courses on generative AI and game development into university LMSs for mass access.

These initiatives, implemented in collaboration with leading global technology companies, achieved wide-scale impact: thousands of students and hundreds of faculty across Kazakhstan gained access to cutting-edge educational content and practice-oriented modules in priority fields such as artificial intelligence, data analysis, cloud technologies, blockchain, game development, and digital marketing. This significantly broadened the range of disciplines available and brought curricula closer to international standards.

Participants in these initiatives acquire not only practical skills demanded in national and global labor markets but also experience in applying technologies to real projects, thereby enhancing their competitiveness. For students, this provides opportunities to learn under internationally recognized standards; for faculty, it means mastering modern teaching methods, integrating digital tools into instruction, and advancing professional qualifications. Companies also benefit, as they build future talent pipelines and embed their technologies within the university environment. In essence, a digital ecosystem is emerging in which universities, students, platforms, and corporations reinforce one another.

Joint initiatives with Google, NVIDIA, Huawei, Binance, Astana Hub, and other partners are systematically integrating Kazakhstan's universities into global educational and research networks. They expand opportunities for academic mobility, encourage participation in international research projects, and create conditions for knowledge exchange with foreign colleagues. These programs are shaping durable connections between Kazakhstan's education system and global digital ecosystems.

Personalization and the lifelong learning concept

In Kazakhstan, MOOCs are increasingly used as a tool for personalized and continuous education. Research confirms that MOOCs support the development of adaptive learning pathways tailored to learners' needs and interests.

For example, an experimental study of the Data Visualization in Excel course from Coursera at Toraighyrov University showed that integrating this online course into the Information and Communication Technologies subject allowed students to select content that matched their individual learning needs. Recognition of the course outcomes ensured that the online learning experience was fully integrated into the formal academic program.

Similarly, findings from the ICERI 2022 conference on the experience of EFL (English as a Foreign Language) instructors demonstrated that MOOCs, when used as a resource within non-formal education, enabled learners to construct their own pathways, drawing on multimedia materials and peer interaction. This aligns with the principles of self-regulated and personalized learning.

Thus, in Kazakhstan's context, MOOCs not only expand access to knowledge but also create conditions for individual educational trajectories, where students can set their own pace and direction of development–particularly in the framework of lifelong learning. The model envisions a combination of formal and non-formal education, which is critical for continuously improving digital and professional skills throughout life.

Case study: **Student participation in Coursera courses in Kazakhstan, 2024**

The initiative to provide Kazakhstani students with free access to Coursera is linked to a directive from President Kassym-Jomart Tokayev. **In 2024, the Ministry of Science and Higher Education granted 40,000 licenses to 93 universities** [40].

Students now have access to more than 12,000 online courses, including 152 courses localized into Kazakh and Russian. Academic-quality translation is carried out by professional translators, university faculty, and experts. During the translation process, more than 9,000 new academic terms were added to the Kazakh language.

In 2024 alone, an additional 20 courses were translated, including Foundations of Teaching and Learning, a specialization in Machine Learning, AI for Everyone, Generative AI for Everyone, Innovative Learning with ChatGPT, Social Media Management, Fundamentals of Social Media Advertising, Trade, Immigration and Exchange Rates in a Globalized World, Prompt Engineering for ChatGPT, Generative AI with Large Language Models, and Introduction to Mechanical Engineering.

In addition, Coursera's built-in machine translation tool makes more than 4,000 courses available in Kazakh and Russian. The range of courses covers diverse fields: business, computer science, data science, information technology, healthcare, social sciences, physical sciences and engineering, arts and humanities, personal development, languages, mathematics, and logic.

The primary goal of this project in Kazakhstan is to equip students with advanced digital and AI application skills, preparing a modern workforce for the national economy. Coursera, as the world's leading online learning platform, offers not only academic courses but also practice-oriented projects and professional certificates. These enable learners to upskill, reskill, and improve their employability by mastering modern competencies. (Таблица 4.2.1.)

Table 4.2.1.
Number of certificates earned, 2023–2024

	2021	2022
2023	46 593	73 003
2024	77 130	164 484
Total	**123 723**	**237 487**

Table 4.2.2.

Most Popular Coursera Courses in 2023–2024

Course Title	Certificates Received		Total
	2023	2024	
21-ғасыр жұмыс орнындағы қарым-қатынас (21st Century Workplace Relationships)	3674	2075	5749
Learning How to Learn: Powerful mental tools to help you master tough subjects	34	3059	3093
Word Forms and Simple Present Tense	430	2648	3078
Programming for Everybody (Getting Started with Python)	2140	733	2873
Artificial Intelligence (AI) for Everyone	48	2847	2895
Time Management for Professional and Personal Productivit	1805	531	2336
Introduction to Microsoft Excel	1376	906	2282
Entrepreneurship I: Foundations of Business	1705	418	2123
Leading Teams: Developing as a Leader	1900	162	2062

Analysis of the most popular courses (Table 4.2.2.) shows that some have maintained high demand since 2023. These include localized courses focused on improving learners' personal productivity, Excel skills, and workplace communication. At the same time, in 2024 there was a marked increase in interest in courses on artificial intelligence and neuroscience, reflecting global trends in skills development.

Within the project, in 2024 a total of 3,093 students completed the course Learning How to Learn: Powerful Mental Tools to Help You Master Tough Subjects. This is one of Coursera's most popular offerings, taught by Dr. Barbara Oakley and Dr. Terrence Sejnowski. The course provides practical insights into how the brain works, drawing on advances in neuroscience and cognitive psychology. Interest in this course may have been influenced by Barbara Oakley's visit to Kazakhstan in October 2024, where she was a keynote speaker at the ConnectEd conference in Astana and conducted a workshop titled Empowering Kazakhstan's Education with Generative AI: Shaping the Future of Learning.

In addition, in 2024, 5,985 students earned 6,555 certificates across 225 courses covering various aspects of AI, machine learning, deep learning, computer vision, natural language processing, generative AI, and their sector-specific applications. Particularly popular were introductory courses such as Artificial Intelligence (AI) for Everyone (in both Kazakh and English versions), as well as applied programs including AI & ML Applications in the Oil and Gas Industry, Artificial Intelligence (AI) Education for Teachers, AI & Law, and Machine Learning with Python.

Analysis of language preferences (Table 4.2.3.) shows that most learners chose courses in English (63%), while localized courses in Kazakh attracted significant interest (24%). The growing demand for English-language courses may be partly explained by Coursera's built-in machine translation tool, which enables learners to study English-language content in their preferred language.

Online courses enable students to make productive use of every free hour and to study at a time convenient to them. As shown in Figure 1, the majority of users engaged in learning activities between 11:00 and 23:00. (Figure 4.2.1.)

Coursera also provided a unique free learning opportunity for rectors, vice-rectors, deans, department heads, and other senior staff of higher education institutions (HEIs) to deepen their understanding of the key principles and potential of generative artificial intelligence. This initiative enables administrators to make more effective strategic and operational decisions in higher education and research management. From August 1 to September 30, 2024, in accordance with the letter of the Ministry of Science and Higher Education of Kazakhstan No. 14-0/3378-vn dated August 1, 2024, a total of 959 higher education leaders successfully completed the course "Generative AI for University Leaders." Among them were more than 50 rectors and vice-rectors, as well as over 900 heads of structural units within HEIs.

In addition to individual courses, over the past two years 2,243 highly motivated students completed specializations–series of related courses designed to provide deep expertise in specific disciplines–earning 2,613 specialization certificates. In 2024 alone, 1,832 students received 2,152 specialization certificates. The most in-demand specializations in 2024 are listed in (Table 4.2.4.)

The average level of student engagement in 2024 reached approximately 80%. In other words, learners completed around 80% of all course activities–including non-graded tasks such as reading materials, watching videos, and listening to audio lectures. This is considered an excellent indicator,

Table 4.2.3.

Popular Courses by Language of Instruction, 2024

Language of Instruction	Certificates Earned		Total
	2023	2024	
English	29 515	120 336	149 851
Kazakh	29 708	26 953	56 661
Russian	13 604	16 279	29 883
Other languages	176	916	1 092
Total	**73 003**	**164 484**	**237 487**

Figure 4.2.1.

Analysis of User Study Time, Based on the Number of Attempts at Graded Assignments, 2024

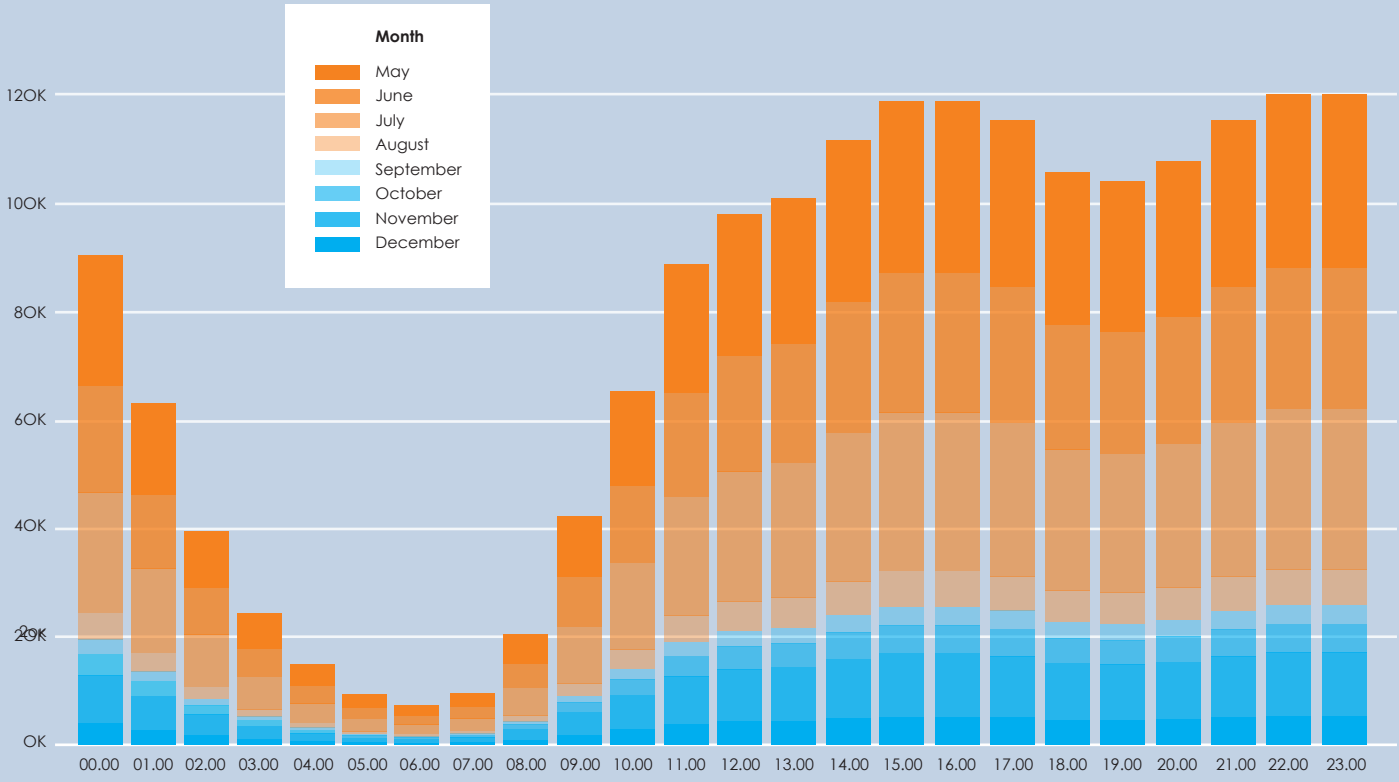


Table 4.2.4.
Most In-Demand Specializations, 2024

293 "Petroleum Engineering with AI Applications"	**126** "Learn Enterprise Data Storage with IBM Storage Scale"
93 "Strategic Leadership and Management"	**64** "Algebra: Elementary to Advanced"
65 "Healthcare Marketplace"	**52** "IBM IT Project Manager"
27 "GIS, Mapping, and Spatial Analysis"	**27** "Google Project Management"
26 "Healthier Materials and Sustainable Building"	**26** "Information Technology (IT) and Cloud Fundamentals"
23 "Tools for Security Specialists"	

consistent with global benchmarks.

To ensure academic integrity in online learning, six Kazakhstani universities piloted the use of AutoProctor and Locking Browser systems in 2024 for administering online examinations. These tools (developed by Coursera) monitor student behavior via camera and microphone, preventing academic dishonesty. The pilot results are encouraging: 786 students successfully completed 22 online courses, with an average trust score of 73.3% during examinations. After additional review of recordings, this figure is expected to exceed 90%, accounting for technical noise and errors. Thus, proctoring technologies make it possible to bring the objectivity of online assessments closer to that of traditional in-person examinations. Kazakhstani universities provided developers with feedback for improving AutoProctor, and such systems are expected to become standard in the coming years.

Partnership with Coursera has provided far more than access to MOOCs. It has transformed Kazakhstan's approach to designing higher and postgraduate education content and diversifying learning formats. A formal mechanism for recognizing Coursera courses has been introduced. Universities have begun integrating Coursera courses into their curricula, replacing traditional disciplines, using them as supplementary classroom resources, and incorporating them into independent student work and mid-term assessments. This integration has encouraged broader adoption of European approaches to recognizing non-formal learning outcomes. In the process, universities have followed methodological recommendations from the Ministry of Science and Higher Education of Kazakhstan, BMG UpSkill guidelines on credit transfer, and internal regulatory documents on MOOC recognition.

The results of MOOC integration into curricula in 2024 will be aggregated and analyzed by universities in 2025.

As part of the Coursera partnership, Kazakhstani universities are expanding teacher education programs by incorporating content on pedagogy and teaching methodology from leading international universities. Specially selected courses and projects develop the key competencies of future teachers, helping them design curricula, organize and evaluate learning processes, and apply modern educational technologies and AI tools. Upon completing online courses, students acquire teaching strategies and methods that support effective instruction in complex subjects, classroom time management, and the development of students' self-regulation skills.

For bachelor's and master's students, universities can now create **individualized learning paths** on Coursera to strengthen the quality of professional training through staged acquisition of new knowledge and skills. These paths are designed to build research competencies and pedagogical assessment skills, allowing future educators to better understand and improve teaching and learning processes. Courses in soft skills and basic psychological support–such as emotional intelligence, leadership, teamwork, and resilience–are also available. Universities may select predefined learning paths from Coursera's catalog or design their own. Upon completion, students receive a **digital badge** with their university's logo, certifying their professional skills and competencies.

Beyond using Coursera for student learning, Kazakhstani universities also gained the opportunity to create **original courses** and publish them on the platform. For course authors, this offers valuable opportunities to present their materials to a global audience, enhance their professional standing, and raise their institution's profile in the academic community. For students, such courses provide access to content adapted to the local context and the specific needs of Kazakhstan's education system. Students can now study not only courses from foreign universities on Coursera, but also locally developed courses–ranging from regional studies to civic engagement–while benefiting from world-class educational technologies.

Although Kazakhstani faculty already had experience developing MOOCs for their institutional platforms, designing courses for Coursera required adapting to the platform's specific standards. Instructors had to master tools such as

for structuring content, **Coach** for interacting with learners, new assessment tools for knowledge testing, and discussion forums for peer exchange. These features ensured high levels of interactivity, flexibility, convenience, and student engagement. By incorporating AI-powered tools, instructors were also able to enrich their courses with content from international universities, making them more engaging and academically robust.

(Table 4.2.5.) presents the online courses developed and uploaded to Coursera in 2024, covering subjects such as cytology, regional studies, logic, research fundamentals, folklore, soft skills, business planning basics, sociology, architecture, Python programming, and others.

In order to provide comprehensive methodological support to universities, in 2024 BMG UpSkill experts conducted 27 online webinars and consultations. These sessions focused on integrating Coursera MOOCs into university curricula, creating and uploading original courses using Course Builder, and expanding the

Таблица 4.2.5.
Online Courses Developed by Kazakhstani Faculty, 2024

		Number of participants
Logic: THE SCIENCE OF CORRECT REASONING **Aigul Tursynbayeva** L.N. Gumilyov ENU	Focuses on developing reasoning and logical thinking skills. Students learn core principles of logic, how to analyze statements and build arguments. The course supports problem-solving through clear and structured approaches.	1519
FUNDAMENTALS OF BUSINESS PLANNING **Aynur Tazhidenova** Kh. Dosmukhamedov Atyrau University	Covers the full cycle of business plan development for entrepreneurs. Includes market analysis, target audience identification, financial modeling, and risk management. Provides case studies of successful projects.	1383
JOURNEY INTO THE CELL **Gulnaz Sadykanova** Amanzholov University	Explores the structure and functions of the cell as the basic unit of life. Uses multimedia and visualizations to explain complex processes. Suitable for students, school pupils, and anyone interested in life sciences.	705
ARCHITECTURAL AND STRUCTURAL DESIGN **Inna Ostapenko; Aleksandr ryantsev** IEC	Provides insights into the principles of building design and construction technologies. Encourages creativity and develops professional competencies essential for future careers in architecture and engineering.	433
FOLKLORE: GENRE AND IMAGE **Gulnaz Saginadin** L.N. Gumilyov ENU	A comprehensive study of folklore as an integrative science, analyzing its links with history, culture, and ethnography. Includes global and Turkic contexts and applies innovative teaching methods.	583

FUNDAMENTALS OF RESEARCH

Dinara Ryspaeva

Ualikhanov University

Teaches research basics from hypothesis formation to publication. Covers data collection, experimentation, analysis, academic ethics, and modern analytical tools. Designed for students, faculty, and early-career researchers.

546

SACRED MANGYSTAU

Bibaysha Nurdauletova

Yesenov University

Examines the cultural and spiritual heritage of the Mangystau region, including sacred sites and their societal importance. Combines theory with practical examples, relevant for researchers and guides.

415

SOCIOLOGY FOR BEGINNERS

Farida Kayupova

Yesenov University

Introduces core concepts of sociology for a broad audience. Aims to develop critical thinking and the ability to analyze social processes. Suitable for students, young professionals, and anyone interested in social sciences.

705

SOFT SKILLS

Bibatpa Koshimova

Yesenov University

Aims to develop emotional intelligence, communication, teamwork, critical and creative thinking. Prepares learners with competencies highly valued in today's labor market.

388

PYTHON: FIRST STEPS IN PROGRAMMING

Nurzhamal Oshanova; Mayra Kemelbek

Abai KazNPU

Introduces Python programming basics for beginners. Focuses on data handling and writing simple programs to build digital competencies.

280

SERVICE LEARNING

Irina Vladimirovna Bisingalieva

Yesenov University

Promotes civic engagement through social project work. Students develop active citizenship skills by solving real community problems.

157

CULTURAL ANTHROPOLOGY

Azhar Zholdubaeva

Al-Farabi KazNU

Structured into four modules, the course covers theoretical and applied aspects of anthropology. Helps learners understand socio-cultural factors in historical development at global, national, and local levels.

31

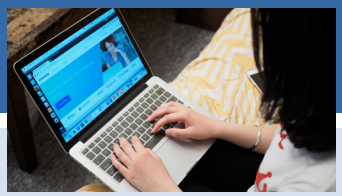
MECHANICS

Talgat Bektasovich Koshtybayev

KNWPU

Examines coordinate changes, progression, and deviations over time. Explores principles of uniform and non-uniform motion

11



ИТОГО

6770

capacity of Kazakhstan's education system through generative AI.

TOP 20

According to Coursera's Global Skills Report 2024, Kazakhstan ranked among the **top 20 out of 109 participating countries** in terms of the share of learners, accounting for **1.06% of all active users worldwide**.

Kazakhstan's successful case in student learning is currently being studied by Coursera's team for possible replication in other countries. Coursera describes Kazakhstan as an emerging "**regional leader in higher education quality**", recognizing the country's achievements in advancing online learning. Notably, the collaborative experience of the Ministry of Science and Higher Education, universities, and employers is highlighted as a **new standard of digital transformation** aimed at the shared goal of preparing a competitive workforce.

Subchapter Conclusion

Thus, it can be concluded that Kazakhstan is successfully integrating into the global movement of massive online education, deriving substantial benefits for its higher education system. In 2024, MOOCs and digital platforms became a key factor in improving the quality of human capital development: students gained access to cutting-edge knowledge, faculty to best practices, and universities to global educational ecosystems. At the same time, a number of challenges remain: expanding locally developed content in the Kazakh language, establishing a regulatory framework for the academic recognition of MOOCs, bridging the digital infrastructure gap between regional and metropolitan universities, and incentivizing the creation of original online courses. Addressing these challenges will allow Kazakhstan to fully realize the potential of massive online learning as a driver of innovation and sustainable development in higher education.

4.3. Integration of Artificial Intelligence and Digital Platforms in the Development of the State Language

The development of the state language – Kazakh – is an integral part of the digital transformation of education and society. In 2024, particular attention was given to ensuring that digitalization strengthens the role of Kazakh in science, education, public service, and everyday life. This was reflected in a series of projects combining modern technologies (AI, web platforms) with linguistic resources.

Digital ecosystem for learning the Kazakh language. The Language Policy Committee of the Ministry of Science and Higher Education, together with the National Scientific and Practical Center "Til-Qazyna," has developed a wide range of online resources for different categories of users:

TilÄlemi

Tilalemi.kz information portal

This portal functions as a hub for news on language policy. It publishes articles by linguists, announcements of competitions and events, and also provides free access to books, dictionaries, and academic journals on the Kazakh language. In effect, Tilalemi.kz has become both a virtual library and a news platform, offering researchers and educators up-to-date resources.

AbaiInstitute

Abai.institute educational website

Launched at the end of 2020, the Abai Institute portal is aimed at promoting the Kazakh language, literature, and culture both domestically and abroad. It is available in six languages (Kazakh, English, German, French, Russian, Turkish, Persian) and serves as a platform for distance learning of Kazakh for citizens, foreign learners, and members of the diaspora. Modeled after the Goethe- and Pushkin-Institutes, it is positioned as an international-level cultural and linguistic center. Abai Institute has organized Kazakh language courses abroad–in the United States, Turkey, France, Germany, Belgium, Iran, Mongolia, Russia, and elsewhere–as well as professional development programs for Kazakh language teachers in these countries. Learning materials for levels A1–C1 have been developed in Kazakh, Russian, English, and Turkish and uploaded to the platform. In 2024, 125 learners from seven international cities (including Istanbul, Paris, and Los Angeles) studied through Abai Institute. The platform also has a mobile application and has become a valuable resource for international educational institutions and cultural centers.

TilQural

Tilqural.kz online service.

Developed by Til-Qazyna in 2024, this interactive platform offers step-by-step learning of Kazakh across five proficiency levels (A1–C1), primarily targeting adults with little or no prior knowledge of the language. After registration, users complete a placement test, and the system recommends a suitable course. Tilqural.kz combines traditional exercises with gamified elements, audio and video materials, and operates similarly to popular apps such as Duolingo or Lingualeo. Its key advantage is personalization: learners can track progress, review lessons, and monitor their learning statistics. Available both via browser and mobile apps (Android/iOS), the service ensures wide accessibility. Looking ahead, the Center plans to standardize teaching methodologies based on Tilqural and, in partnership with the University of Oxford, develop new Kazakh language textbooks.

Multimedia sites for language promotion. The Center has also launched several specialized websites:

Tilmedia.kz

Tilmedia.kz – a trilingual portal (Kazakh, Russian, English) for engaging Kazakh language learning through audio and video content. It offers sections such as "Listen," "Watch," and "Read," featuring audio recordings, videos, cartoons, films with subtitles, and reading materials. Versions in Latin and Arabic scripts are also available, making the site useful for learners from different regions. Tilmedia is especially valuable for children and beginners.

BalaTili

Balatili.kz

Balatili.kz – a specialized site for children aged 3–10, as well as parents and educators. It hosts hundreds of interactive resources: coloring pages, worksheets, teaching guides, games, audio dictations, puzzles for writing skills, and collections of stories, poems, and riddles in Kazakh. Essentially, it functions as a free "online kindergarten" for the Kazakh language. In 2024, new sections were added with methodological articles for teachers and electronic materials for primary schools. Balatili.kz has become a popular tool in preschools and families seeking to nurture the native language from an early age using modern IT tools.

Qazaqsozi
(Қазақ сөзі)

Qazaqsozi (Қазақ сөзі) – a mobile app containing a core vocabulary for beginners, including audio pronunciations and usage examples. Based on the well-known printed textbooks Qazaq Sızı (2016–2017), it represents their digital continuation.

Tilorta.kz

Tilorta.kz – an electronic database on Kazakh language teaching infrastructure. It includes information on all state and private language centers, teachers, textbooks, and audiovisual resources. Users such as policymakers or methodologists can quickly identify available resources in their region. Tilorta functions both as a reference tool and as a platform for professional exchange among educators.

Together, these resources form a digital ecosystem for supporting the Kazakh language, designed for diverse audiences–from children and their parents to foreign researchers. What unites them is that they are free, interactive, and online, dramatically broadening access to language learning and literacy improvement.

Automation of language analysis and AI models. The key innovation of 2024 was the application of artificial intelligence to the preservation and development of the Kazakh language. Following the President's directive on advancing AI in Kazakh, Til-Qazyna, in cooperation with research institutes and Nazarbayev University, developed the first large language model for Kazakh–KazLLM. Similar to GPT-type chatbots, KazLLM was trained on an extensive corpus of Kazakh texts to perform natural language processing tasks (text generation, translation, analysis, etc.). The model was trained on a national corpus of approximately 1.04 billion words, compiled by over 140 researchers from 26 universities and research institutes. The corpus covered 115 fields of knowledge, from philosophy and history to biology and mathematics. Each institution contributed: for example, Al-Farabi KazNU curated philosophy and astronomy texts, the Institute of Mathematics provided mathematics texts, the Institute of History compiled national history, and medical universities contributed medical texts. This unprecedented project created the first full-scale dataset for Kazakh AI. By the end of 2024, the first open-source version of KazLLM was released, allowing researchers and developers to use it freely for non-commercial purposes–for instance, to create Kazakh-language chatbots, machine translation systems, or intelligent assistants. KazLLM is already being called the "Kazakh GPT," and dozens of Kazakh-language digital applications are expected to emerge in the coming years.

In parallel, work is underway on the **TilQazyna intelligent learning model**, planned for launch in 2026. This comprehensive AI system will be able to: generate coherent Kazakh texts on given topics, paraphrase sentences, analyze context, automatically summarize texts, correct grammar and punctuation, explain

idioms, and translate technical terms into plain language. In essence, TilQazyna will function as a virtual teacher and editor of the Kazakh language. The system will include a voice assistant "Til-Qazyna" capable of interacting with users by voice and text, teaching Kazakh at levels A1–C1. In 2024, a test version was released, already functional at three levels (A1–B1).

Integrated into apps or messengers, this assistant can hold dialogues in Kazakh, correct pronunciation, and suggest new vocabulary based on learners' interests–making language learning more personalized and effective.

Language technologies for speech quality.

Til-Qazyna is also developing applied AI-based services.

QazGramma

Qazgramma
онлайн-платформа

One such initiative is Qazgramma—an online Kazakh text proofreading platform launched in 2024. It allows users to upload any text and automatically detects typos, spelling, grammatical, and punctuation errors, offering suggested corrections. In addition, Qazgramma suggests synonyms for frequently repeated words and can rephrase sentences for better style. In essence, it is Kazakhstan's counterpart to the widely known Grammarly service, tailored specifically to the norms of the Kazakh language. By the end of 2024, Qazgramma's knowledge base covered more than 684,000 word forms, including archaic and dialectal variants, ensuring highly accurate checks. The platform is already being used by journalists, civil servants, and students—anyone who values writing correctly in the state language. Future plans include integrating Qazgramma into text editors and messaging applications to provide real-time corrections.

Another major project is the **national corpus of the Kazakh language** (Qazcorpora.kz), launched by Til-Qazyna in 2024 to strengthen the role of Kazakh as a language of science. This online tool functions as a search engine across a large body of texts. Qazcorpora currently contains three subcorpora: publicistic (newspaper and online articles), spoken (interview transcripts and dialogues), and scientific (dissertations and monographs). The total volume has already exceeded 18 million word uses. Users—such as linguists or AI developers—can search for a word or phrase and view hundreds of real examples of its use across different genres, with metadata such as style, date, and source. This significantly facilitates linguistic analysis and algorithm development.

In parallel, a National Corpus project is being carried out under the auspices of the Ministry of Science and Higher Education. By the end of 2024, its text base reached 33 million word uses—24.5% of the target volume—representing a 10% annual increase. New subcorpora have been added, including scientific, publicistic, children's, and educational texts.

The corpus is regarded as a foundation for numerous applications—translators, voice

assistants, and models like KazLLM—making its expansion directly tied to the success of future AI projects.

Unified dictionary fund and terminology.

A crucial aspect of language digitalization is the systematization of dictionaries and terminology.

In 2024, Til-Qazyna began building the National Dictionary Fund, a project to digitize and integrate all lexical resources of the Kazakh language. The goal is to create a unified digital base that consolidates explanatory dictionaries, bilingual dictionaries, terminology collections, phraseological dictionaries, and more. The multi-year effort includes scanning and recognizing older publications, unifying data, and creating a user-friendly search interface. Special emphasis is placed on making the data usable in AI environments.

The project's objectives include:

- Preserving the norms of literary Kazakh by codifying its structure, pronunciation, and orthography.
- Building a centralized system of corpora that interconnects existing text collections.
- Updating the terminology database to provide free access to approved terms across different fields, avoiding inconsistencies.
- Creating a repository of standardized documents—templates for official letters, applications, contracts, and more—particularly valuable for government and service sectors.
- Providing researchers with tools for linguistic and historical studies through a large, structured data platform.
- Developing a representative text dataset covering all styles—from fiction to conversational social media.
- Supporting AI model development by supplying clean, structured training data.

The project consists of four core components: dictionaries, the national corpus, the terminology base, and the text dataset. Once completed, the entire lexical fund of the Kazakh language will be digitized and available online with multilingual search capabilities. Society will gain a convenient resource—akin to the Oxford English Dictionary or Merriam-Webster—while the research community will benefit from a comprehensive dataset for linguistic and interdisciplinary studies. Notably, Kazakhstan is adopting best practices from similar projects in Russia, Europe, and the United States, reflecting the country's high ambitions in this field.

Already today, several elements of this national language fund are in operation:

Termincom

Termincom.kz – the official terminology portal

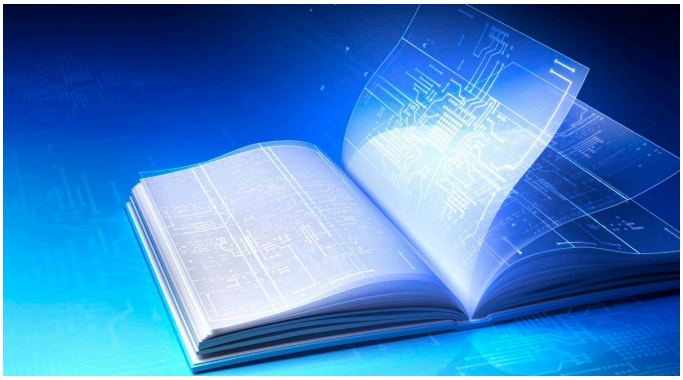
where all new terms approved by the State Terminology Commission are published. The Termincom database contains approximately 350,000 terms with translations and definitions, searchable across six criteria (language, field, year of approval, etc.). The site also hosts a professional forum where experts discuss new terminology proposals. In 2024, the Commission approved

2,650 new terms

(in areas such as oil and gas, transport, and economics), bringing the total fund to 41,150 terms. This represents a 15% increase compared to 2022, although the approval pace slowed slightly compared to 2023. All approved terms are published promptly on **Termincom.kz**, which has become an indispensable resource for translators, journalists, and researchers.

Sözdıkqor

Sozdikqor.kz – a universal electronic dictionary database



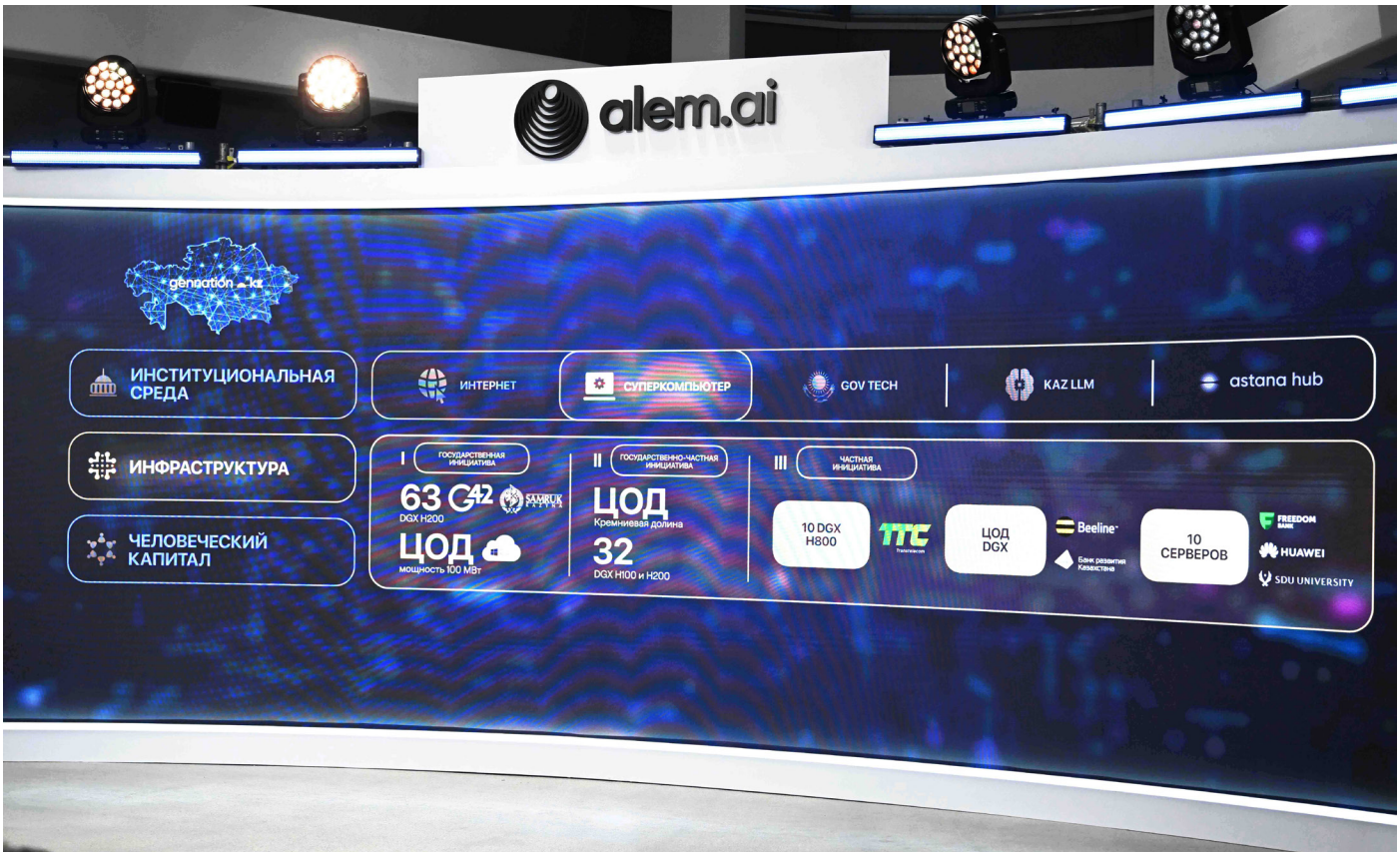
that includes common vocabulary, dialectisms, archaisms, scientific terms, and idioms. The total number of entries now exceeds 1.5 million. In effect, Sozdikqor integrates multiple dictionaries (explanatory, bilingual, phraseological, etc.) into a single interface. For convenience, mobile apps and even a Telegram bot have been launched, enabling users to find translations directly in the messenger. In 2024, Sozdikqor was enriched with new sections, such as a youth slang dictionary and a collection of archaic words with literary examples. This makes the resource valuable both for philologists and the general public.

Results and indicators of language policy in 2024. Thanks to these measures, positive dynamics in Kazakh language proficiency are evident. According to the annual sociological survey, the share of Kazakhstan's population proficient in the state language reached **81.5%** (an increase of 0.5% over the year). Particularly significant is the rise in the share of civil servants with B2-level Kazakh: in 2024, 4,831 individuals (40% of those tested) demonstrated this level, a 5% increase compared to the previous year. These figures are based on the results of the **KAZTEST** national language competency assessment, which was taken by more than 32,000 people in 2024. The use of Kazakh in official documentation is also expanding: new corpora of official documents in Kazakh are being compiled, alongside the development of automated systems for document translation.

the growing share of Kazakh-language content in the digital sphere. Localization successes—for example, the Coursera courses described in Section 4.2—have produced thousands of new terms and educational resources. As a result, Kazakh is increasingly used in high-tech fields previously dominated by English. The launch of **KazLLM** and other AI projects has created conditions in which the Kazakh language will no longer remain "invisible" to global IT systems. Voice assistants, neural networks, and office applications can now "understand" and generate Kazakh texts, significantly enhancing the language's competitiveness and usability.

Subsection conclusion. The year 2024 marked a breakthrough for Kazakhstan in integrating efforts to develop the state language with digital technologies. Numerous platforms, applications, and AI systems were created that serve two objectives simultaneously: expanding access to Kazakh language learning for all and embedding Kazakh into the digital space of science, technology, and software. This dual approach ensures the sustainability of language policy: on the one hand, the number of people proficient in Kazakh continues to grow thanks to accessible digital tools; on the other, the language itself adapts to the challenges of the 21st century, enriched with new terminology and "learning" to function in computers and applications.

Much work still lies ahead—from translating AI interfaces into Kazakh to raising the share of Kazakh-language content on the Internet to a truly competitive level—but the foundation has now been firmly laid.



CONCLUSION

In 2024, the digitalization of higher education in Kazakhstan entered a stage of scaling and strategic focus on advanced technologies. During the reporting period, a solid foundation for further growth was established:

- The formation of a unified digital infrastructure was effectively completed (most universities are now connected to high-speed internet, and key IT services—from digital documents to LMS and proctoring—have been implemented).
- Access for students and faculty to global educational content has been expanded (through Coursera and other platforms) without linguistic or geographic barriers.
- Systematic integration of AI into education has begun (new academic programs on AI, an inter-university standard, and the launch of the national accelerator program AI-Sana).
- Initial steps were taken toward creating a national digital knowledge ecosystem—from the academic supercomputing cluster to the growing library of Kazakhstani online courses and localized educational products in the Kazakh language.
- Significant progress has also been made in language digitalization policy: thanks to digital platforms and AI projects, the Kazakh language has secured its place in online education and technology. Dozens of international courses have been localized, the first national large language model KazLLM was developed, and new grammar-checking and speech technologies were launched. These achievements demonstrate that Kazakhstan is not simply adopting external technologies, but is building its own digital solutions tailored to national needs.

Key challenges. The analysis of progress also highlights systemic issues that require strategic solutions in the coming years:

- **First**, digital inequality persists across universities. National and metropolitan institutions are far ahead in terms of equipment and staffing, while pedagogical, agricultural, and regional universities face shortages of modern computers, slow internet, and limited IT personnel. Without leveling these resources, equal quality of education remains difficult to achieve.
- **Second**, there is a shortage of qualified IT professionals within the education system. University IT salaries are lower than in the private sector, making it difficult to retain administrators, programmers, and data specialists. At the same time, a share of faculty—particularly older generations—still lack sufficient digital skills and are reluctant to actively use AI tools in their teaching.
- **Third**, the IT landscape of universities remains fragmented. Many institutions operate multiple disconnected information systems—for admissions, academic records, libraries, HR, and more—with weak integration between them. This leads to data duplication, manual reporting, and difficulties in large-scale data analysis.
- **Fourth**, the financial sustainability of digital initiatives is not yet guaranteed. Many projects rely on one-time grants,

external investments, or pilot budgets. Commercial software licenses require annual payments, placing a heavy burden on university finances.

- **Fifth**, at the intersection of education and language policy lies the challenge of increasing the volume and quality of Kazakh-language content. Despite progress with localized Coursera courses and newly developed resources, much scientific and technical material remains unavailable in the state language. This hinders both instruction in Kazakh and the development of AI systems, which require large-scale data in the language.
- **Finally**, it is essential to ensure the long-term institutionalization of new practices—from the recognition of MOOC results in curricula to the permanent operation of the Terminology Commission in adapting to rapidly emerging new terms that require timely approval.

Addressing these priorities will allow Kazakhstan to move from the stage of "digitalization of individual components" to the creation of a **unified digital ecosystem for higher education.** In such an ecosystem, all universities—regardless of their location or profile—will be connected by common platforms and standards, share resources and data, and provide students with genuinely equal opportunities for learning and development.

In the long term, this digital ecosystem of higher education will serve as the foundation for building competitive human capital—graduates capable of working effectively and innovating in a digital economy, while preserving national identity and cultural values.

Chapter 5.

Higher Education Infrastructure: New Solutions for a Comfortable Student Environment

The development of higher education institutions' infrastructure is an integral component of ensuring the quality of education and enhancing the competitiveness of Kazakhstani universities. A comfortable and functional educational environment contributes not only to the successful acquisition of academic programs but also to the formation of a sustainable student life, academic mobility, intercultural integration, and social adaptation.

In recent years, Kazakhstan has been implementing a systemic approach to modernizing the infrastructure of higher education institutions. Particular attention is given to the construction and renovation of student dormitories, the introduction of enhanced comfort standards, the creation of conditions for students with special educational needs, as well as the development of modern university campuses integrating educational, research, and social infrastructure.

Infrastructure projects in higher education are being implemented through public investment, public–private partnership mechanisms, as well as within the framework of international cooperation. These measures are aimed at creating a sustainable university ecosystem that aligns with the strategic objectives of the country's socio-economic development and global trends in higher education.

5.1. **Construction and Modernization of Student Dormitories:** Trends and Implementation Mechanisms

Ensuring students have access to quality and affordable housing is one of the key priorities of state policy in the field of higher education. This work is carried out in line with the objectives set out in the Address of the Head of State of September 1, 2022, **"A Fair State. One Nation. A Prosperous Society."** In Astana, a specialized project front office for the construction of student dormitories has been established to coordinate the efforts of all stakeholders, bringing together representatives of government bodies, higher education institutions, and private investors.

Between 2019 and 2024, significant progress was made in addressing the shortage of student housing in the country. During this period, a total of 251 dormitories were commissioned, creating 62,045 additional bed spaces. By comparison, only 9,000 places were built between 2008 and 2018.

Thanks to these measures, the overall shortage of places decreased from 14,873 in 2019 to 2,488 in 2024. The results of the past two years have been particularly impressive: in 2023, 8 dormitories with 1,170 places were built, and in 2024, a further 7 dormitories with 4,200 places were constructed. In total, 40 dormitories were commissioned in 2024, of which 32 were newly built (9,555 places) and 8 were reconstructed (1,524 places).

An important aspect of the modern approach to student housing construction has been the introduction of new comfort standards. Of the 11,000 places commissioned in 2024, 2,180 were equipped according to enhanced standards, including coworking spaces, libraries, sports halls, and other modern amenities. Such facilities include:

420 places	the dormitory of Narxoz University
382 places	Bastau Damu KZ LLP for students of L.N. Gumilyov ENU
1 200 places	M. Kozybayev North Kazakhstan University
360 places	AdElina LLP in Almaty
100 places	Zharkyn Construction LLP in Astana (Astana IT University
100 places	QRE LLP in Kaskelen.

This corresponds to the growing demands of students, including international students, whose number reached 31,000 in 2024. Notably, for the first time this year, the number of students from Asian countries exceeded that of students from CIS countries.

Mechanisms of public–private partnership are actively used to implement large-scale student housing projects.

A notable example is the collaboration with the Asian Development Bank under the project to create 5,900 new places for Satbayev University.

Under the program-based PPP mechanism, the project is co-financed by the university (up to 30%) and a private investor (up to 70%), with investment returns realized over six years through a government procurement mechanism, and up to 15% of the facility is transferred to the private investor for commercial premises.

Significant support is also provided by local executive bodies: the akimats of Astana and Almaty allocated land plots totaling over 100 hectares to universities and increased payments for construction by 18% and for reconstruction by 98%. Construction payments amount to 195 MCI (720,000 tenge in 2024) per student per year in the regions and Astana, and 230 MCI (849,000 tenge) in Almaty. For reconstruction, payments are set at 182 MCI in Astana and Almaty, and 47 MCI in other regions.

Among the most significant facilities built in recent years is the 2,656-place dormitory for L.N. Gumilyov Eurasian National University. This is the largest student dormitory in Kazakhstan, covering an area of 51,401 square meters. It provides inclusive living conditions, with 32 beds adapted for persons with disabilities. The dormitory also accommodates master's and doctoral students.

an area of
51 401
square
meters

Another important project was the creation of a 1,200-place dormitory for the Arizona University branch at M. Kozybayev North Kazakhstan State University – the largest student housing complex in the northern region of the country.

In 2025, the commissioning of seven more dormitories with a total of 3,400 places is planned, which will completely eliminate the shortage of student housing in the capital. Special attention is given to facilities for universities such as the Medical University, Astana IT University, and the National University of Sports. In Astana, the planned construction includes: a 400-place dormitory for ENU, a 1,000-place dormitory for the Polytechnic College, a 500-place dormitory for Astana IT University, and a 450-place dormitory for the Medical University. Land plots for the new campuses have already been allocated: ENU – 58 ha, Astana IT University – 7 ha, Medical University – 3.2 ha, Esil University – 0.2 ha, Coventry University Kazakhstan – 7.9 ha, and Pedagogical University – 20 ha.

5.2. Academic Campus Projects: Experience, Initiatives, and Future Development

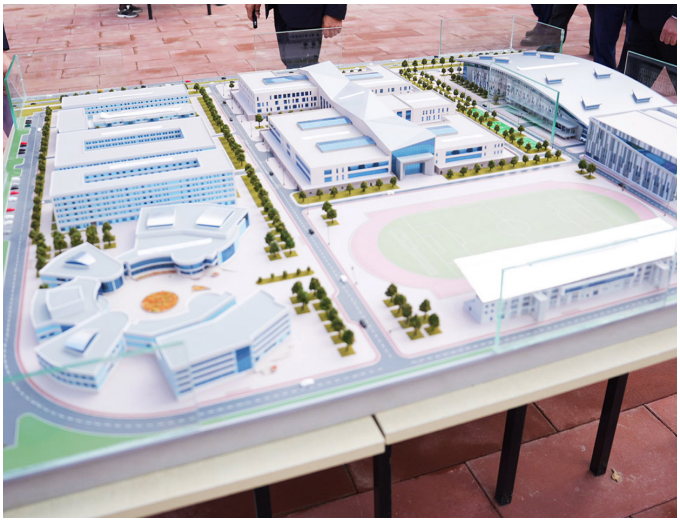
The creation of modern academic campuses has marked a new stage in the development of higher education in Kazakhstan. Astana is positioned as a major academic and research center, bringing together 34 branches of higher education institutions and tens of thousands of students from across the country and abroad.

One of the most ambitious projects in this area is the creation of "ENU City" – the new campus of L.N. Gumilyov Eurasian National University. This large-scale project involves the development of a 58-hectare area, which will include academic buildings, research centers, dormitories, and social infrastructure. The total area of the buildings under construction will be 350,000 square meters, and the campus will accommodate up to 12,000 students. The project includes the construction of 14 academic buildings (115,000 sq.

m), a library with 600,000 storage units (19,000 sq. m), a technopark (6,700 sq. m), 26 dormitories with 7,000 places, and residential blocks for staff (townhouses) for 96 people.

Equally significant is the project of the National University of Sports, which will be located on a 206,171-square-meter site. This unique educational cluster will include academic buildings for 2,000 students and two dormitories with a total of 1,500 places. The university's distinctive feature will be its specialized focus on training professionals for the sports industry, including coaches, sports managers, physicians, biomechanists, and other specialists.

An important direction in the development of academic infrastructure has been the expansion of international cooperation. A successful example of this approach is the establishment of the Arizona University branch at M. Kozybayev North Kazakhstan State University. This project has not only introduced international educational standards to the region but also contributed to the creation of a modern 1,200-place dormitory.



In the coming years, efforts will continue to implement new comfort standards in student campuses. Active use of smart technologies, the creation of specialized zones for self-development and recreation, as well as the development of inter-university infrastructure through the establishment of consortia, are planned. These measures will optimize resource use and create conditions for interdisciplinary interaction between students and faculty.

Between 2019 and 2024, 21 academic and administrative buildings were commissioned in Kazakhstani universities. In 2024, the implementation of the "KazNU City" campus project began, with a total cost of 240 billion tenge. Completion of the design and estimate documentation is scheduled for Q4 2025, with construction expected to finish by 2029. The campus is designed to accommodate 32,000 students, with a total built-up area of 370,000 sq. m on a 72.4-hectare site.

The implementation of large-scale infrastructure projects in higher education is aimed at creating a favorable environment for learning, research, and personal development of students. A comprehensive approach, combining government support, private investment, and international cooperation, enables Kazakhstan not only to address current challenges in providing student housing but also to lay the foundation for the long-term development of higher education in line with the best global standards.

CONCLUSIONS

The development of higher education infrastructure in Kazakhstan demonstrates a systemic and comprehensive approach, encompassing both the construction and modernization of student dormitories and the creation of modern academic campuses. Over the past five years, the shortage of student housing has been significantly reduced – from nearly 15,000 places in 2019 to less than 2,500 in 2024, with complete elimination of the shortage in the capital planned for 2025. The focus has been placed not only on quantitative indicators but also on quality – through the implementation of enhanced comfort standards, inclusive environments, and modern social infrastructure.

Large-scale projects such as "ENU City," "KazNU City," and the campus of the National University of Sports reflect a strategic shift toward creating integrated university ecosystems that combine academic, research, residential, and recreational spaces. Public–private partnerships, support from local executive bodies, and international cooperation – including collaboration with foreign universities and international financial institutions – play a key role in implementing these initiatives.

The application of new standards, smart technologies, and the creation of zones for self-development and inter-university infrastructure lay the groundwork for the long-term enhancement of the competitiveness of Kazakhstani universities in the global education market. Collectively, these measures strengthen the country's position as an emerging academic hub, capable of attracting not only students from across Kazakhstan but also a significant number of international learners.

Chapter 6.

Internationalization of Higher and Postgraduate Education

6.1. Academic Mobility of Students and Faculty

The number of Kazakhstani students seeking to study at foreign universities exceeds the number of international students enrolled in universities in Kazakhstan. Accordingly, the number of universities implementing incoming academic mobility is 1.5 times smaller (53 universities) than those supporting outgoing mobility (92 universities).

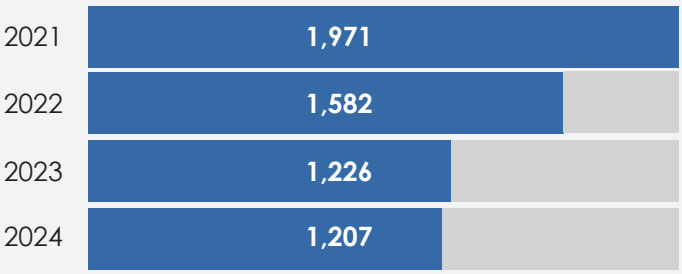
Regarding regions of origin, it is important to note the significance of the CIS, which remains the primary source of international students. In 2024, the largest share of outgoing academic mobility was directed to Poland – **15%** (**691 students**), while the largest share of incoming academic mobility came from Kyrgyzstan – **34%** (**411 students**).

With regard to funding sources, both Kazakhstani and international students most commonly pursue their studies either through reciprocal exchange agreements between partner institutions or through self-financing.

Academic mobility of international students (inbound mobility)

According to data from Kazakhstani universities (103 civilian institutions), the total number of international students who participated in Kazakhstan's academic mobility program during 2021–2024 amounted to 5,986 (Figure 6.1.1).

Figure 6.1.1.
Academic mobility of international students (number of persons)



Source:

Table 6.1.1.
Number of Students by Incoming and Outgoing Mobility, 2021–2024

Type of Academic Mobility / Year	2021	2022	2023	2024
Incoming Mobility	1971	1582	1226	1207
Outgoing Mobility	3246	3613	4426	4416

In 2024, the number of international students participating in academic mobility programs totaled 1,207, of which

- **online** – **217** persons (18%),
- **offline** – **990** persons (82%).

Compared to 2023, the number of students decreased by 2%, or 19 persons (2023 – 1,226 students).

In the current year, six universities of the Republic of Kazakhstan implemented online academic mobility programs for international students (Table 6.1.2).

In the current year, **53 universities** admitted international students under mobility programs,

- **national universities** – 8 из 11
- **state-owned NACs** – 17 из 29
- **private universities** – 16 из 44
- **joint-stock companies** – 11 из 16
- **international university** – 1 из 1

(Full information is provided in Appendix 1)

Out of the total number of students who arrived under academic mobility programs [42].

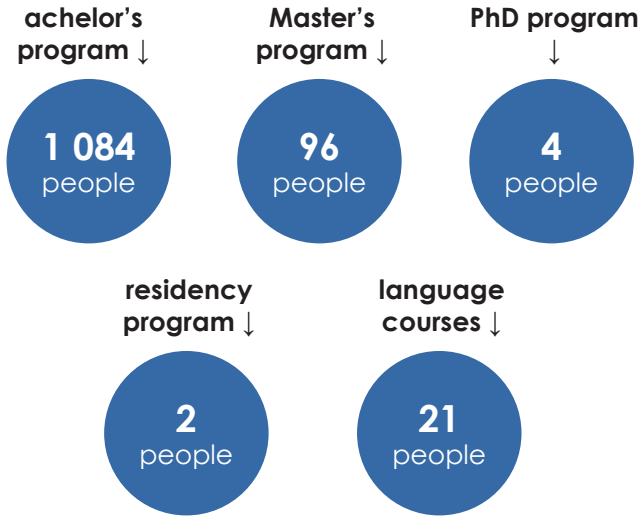


Table 6.1.2.

Online academic mobility of international students, by Kazakhstani universities and fields of study

Name of University	Number of students by fields of study
Almaty Technological University	Business, Management and Law – 29; Natural Sciences – 5; Engineering, Manufacturing and Construction – 62; Services – 27
West Kazakhstan Innovation and Technological University	Business, Management and Law – 2
S. Seifullin Kazakh Agrotechnical Research University	Engineering, Manufacturing and Construction – 26
Abai Kazakh National Pedagogical University	Education – 6
Karaganda Medical University	Health – 30
E.A. Buketov Karaganda University	Business, Management and Law – 13; ICT – 17

By type of mobility,
- **participated in credit academic mobility** – **1153** stud.
- **in summer schools**– **14** stud.
- **науч.стажировка и практика** – **40** stud.

By regions of arrival, in 2024 the following number of students studied at universities in Kazakhstan
- **CIS countries** (7 countries)– **788** stud.
- **Southeast Asia** (10 countries) – **181** stud.
- **Europe** (25 countries) – **221** stud.
- **USA** – **10** stud.
- **Middle East** – stud.
- **Africa** – stud.

(Full information is provided in Appendix 2)

The largest number of students seeking to study at universities of Kazakhstan annually comes from the CIS – 788 students (2023 – 704 out of 1,226). Compared to the same period of the previous year, there has been a sharp increase in the number of students from Kyrgyzstan (Table 6.1.3).

Among CIS countries, **Kyrgyzstan** is the leader this year with **411** students (2023 – 215).

Students wishing to study from universities
- **Azerbaijan** (2023 – **0**, 2024 – **6**)
- **Armenia** increased (2023 – **0**, 2024 – **2**).

The number of students from [country/region] decreased by 17% and 65%
- **Russia** (2023 – **264**, 2024 – **219**)
- **Uzbekistan** (2023 – **167**, 2024 – **59**).

"Since 2017, universities in Kazakhstan have accepted a total of 5,255 students under mobility programs from universities in CIS countries (Table 6.1.3)

Among Southeast Asian countries, China was the leading country in terms of sending its students, with 114 students. Interest was

Table 6.1.3.
Academic mobility of international students from CIS countries, persons

Country	2021	2022	2023	2024
Azerbaijan	48	-	-	6
Armenia	16	-	-	2
Belarus	-	22	8	13
Kyrgyzstan	326	315	215	411
Russia	696	590	264	219
Tajikistan	134	41	50	78
Turkmenistan	-	-	-	-
Uzbekistan	498	112	167	59
Total	**1718**	**1080**	**704**	**788**

Table 6.1.4.
Academic mobility of international students from Southeast Asian countries, persons

Country	2021	2022	2023	2024
Bangladesh	-	-	-	-
Vietnam	-	-	-	9
Hong Kong	-	-	-	-
India	-	3	-	-
Indonesia	-	50	-	2
China	61	157	111	114
Malaysia	6	3	3	6
Mongolia	-	-	-	1
Pakistan	-	-	-	3
Singapore	-	4	4	3
Thailand	-	-	-	7
South Korea	14	17	19	14
Japan	9	6	57	22
Total	**90**	**240**	**194**	**181**

also observed from students of Vietnam (9) and Thailand (7). Since 2017, universities of Kazakhstan have admitted a total of 1,432 students from Southeast Asian universities under mobility programs. Table 6.1.4.)

Table 6.1.5.
Academic mobility of international students from European countries, persons

Country	2021	2022	2023	2024
Austria	1	-	-	1
Belgium	-	2	3	3
Bulgaria	-	-	-	1
United Kingdom	-	-	26	21
Hungary	-	1	1	4
Germany	3	5	37	19
Georgia	-	2	-	-
Denmark	-	-	-	10
Spain	1	-	2	2
Italy	-	3	2	7
Latvia	-	2	-	1
Lithuania	-	1	1	1
Netherlands	-	7	2	1
Norway	-	-	2	2
Poland	2	8	18	18
Romania	3	3	2	3
Serbia	-	-	-	1
Slovakia	-	20	5	1
Slovenia	-	2	1	2
Tьrkiye	52	28	21	23
Ukraine	-	24	21	27
Finland	1	-	-	-
France	24	18	34	51
Croatia	-	-	-	1
Czechia	3	7	2	17
Switzerland	-	15	4	3
Sweden	-	4	4	1
Total	**90**	**152**	**188**	**221**

According to the analysis, the number of applicants from universities has noticeably increased in European countries:

- **Denmark** (2023 – **0**, 2024 – **10**)
- **France** (2023 – **34**, 2024 – **51**)
- **Czech** (2023 – **2**, 2024 – **17**).

The number of students decreased from:

- **he United Kingdom** (2023 – **26**, 2024 –**21**),
- **Germany** (2023 – **37**, 2024 – **19**)
- **Slovakia** (2023 – **5**, 2024 – **1**).

Since 2017, universities of Kazakhstan have admitted a total of 972 students from European universities under mobility programs. (Table 6.1.5.)

Thus,

- among **European** countries, the largest number of students came from France – **51** stud.,
- among **Asian** countries – from **China** – **114** stud.,
- among **CIS** countries – from Kyrgyzstan – **411** stud.,
- as well as from the United States – **10** tud. (Table 6.1.6.)

By sources of funding, the largest number of students studied:

- **through mutual exchange between universities** – **855** stud.,
- **using their own funds** – **126** stud.,
- **funded by the sending party** – **188** stud.,
- **funded by the Kazakhstani university** – **17** stud.
- **funded by international grants** (Erasmus+, DAAD, Orkhun, Turkish Embassy program, Russian Federation scholarship) – **21** stud..

The majority of international students studied in the field of Business, Management, and Law – **269** students, while the smallest number were enrolled in Natural Sciences – **20** students.

In terms of fields of study, the distribution of international students was as follows:

01 | **Education** – **197** stud. (top sending countries: Russia – 98, Kyrgyzstan – 45, China – 30)

02 | **Humanities and Arts** – **230** stud. (Kyrgyzstan – 75, China – 35, Russia – 33)

03 | **Social Sciences** – **65** stud. (Kyrgyzstan – 14, Russia – 12, Tьrkiye – 11)

04 | **Business, Management and Law** – **269** stud. (Kyrgyzstan – 129, France – 40, Russia – 24)

05 | **Natural Sciences** – **20** stud. (Kyrgyzstan – 9, China – 5, Russia – 3)

06 | **Information and Communication Technologies** – **45** stud. (Ukraine – 17, Tajikistan – 12, Kyrgyzstan – 9)

07 | **Engineering, Manufacturing and Construction** – **122** stud. (Kyrgyzstan – 74, Russia – 35, Uzbekistan – 7)

08 | **Agriculture** – 33 stud.(China – 32)

09 | **Veterinary** – 0 stud.

10 | **Health and Welfare (Medicine)** – 186 stud.(Russia – 70, Uzbekistan – 20, Kyrgyzstan – 19)

11 | **Services** – 40 stud.(Kyrgyzstan – 37)

Table 6.1.7.
Academic mobility of Kazakhstani students for the period 2021–2024, persons

	2021	**2022**	**2023**	**2024**
state budget	350	516	557	539
non-budgetary	2896	3097	3901	3877
Total	**3246**	**3613**	**4458**	**4416**

The main challenges in implementing international student mobility, as reported by universities, are obtaining a Kazakhstani visa and discrepancies between the academic calendars of Kazakhstani and foreign universities [42].

Academic mobility of Kazakhstani students
(outgoing mobility)

The total number of Kazakhstani students who participated in the academic mobility program over the four years since 2021 amounted to 15,733. (Table 6.1.7.)

Table 6.1.6.
Academic mobility of international students by region, persons

Year	**Region**						**Total**
	Europe	**CIS**	**Southeast Asia**	**America**	**Middle East**	**Africa**	
2021	90	1718	90	73	-	-	1971
2022	152	1080	233	115	-	2	1582
2023	188	704	194	130	8	2	1226
2024	221	788	181	10	2	5	1207
Total	**651**	**4290**	**698**	**328**	**10**	**9**	

Table 6.1.8.

Online academic mobility of Kazakhstani students by universities of the Republic of Kazakhstan and fields of study

Name of university	Number of students by fields of study
Astana IT University	ICT – 1
Almaty Humanitarian and Economic University	Pedagogical Sciences – 8, Social Sciences – 1, Business, Management and Law – 4
Almaty Technological University	Humanities and Arts – 8, Business, Management and Law – 30, Natural Sciences – 7, Engineering, Manufacturing and Construction – 62, Services – 28
O.A. Baikonurov Zhezkazgan University	Business, Management and Law– 2
West Kazakhstan Innovative Technological University	Pedagogical Sciences – 10, Business, Management and Law – 7, Information and Communication Technologies (ICT) – 2, Engineering – 24, Services – 4
West Kazakhstan Marat Ospanov Medical University	Health – 26
L.B. Goncharov Kazakh Automobile and Road Institute	Social Sciences – 2
S. Seifullin Kazakh Agrotechnical Research University	Engineering, Manufacturing and Construction – 31
Satbayev University	Engineering– 9
Kazakhstan University of Innovative and Telecommunication Systems	Business, Management and Law – 6, Information and Communication Technologies (ICT) – 6, Engineering, Manufacturing and Construction – 5
Abai Kazakh National Pedagogical University	Pedagogical Sciences – 9
Academician E.A. Buketov Karaganda University	Pedagogical Sciences – 11, Business, Management and Law – 42, Natural Sciences – 12
Sh. Yessenov Caspian University of Technology and Engineering	Pedagogical Sciences – 7,Business, Management and Law – 28,Information and Communication Technologies (ICT) – 1
Miras University	Pedagogical Sciences – 39, Humanities and Arts – 3, Business, Management and Law – 19, Information and Communication Technologies (ICT) – 9
KIMEP University	Social Sciences – 1

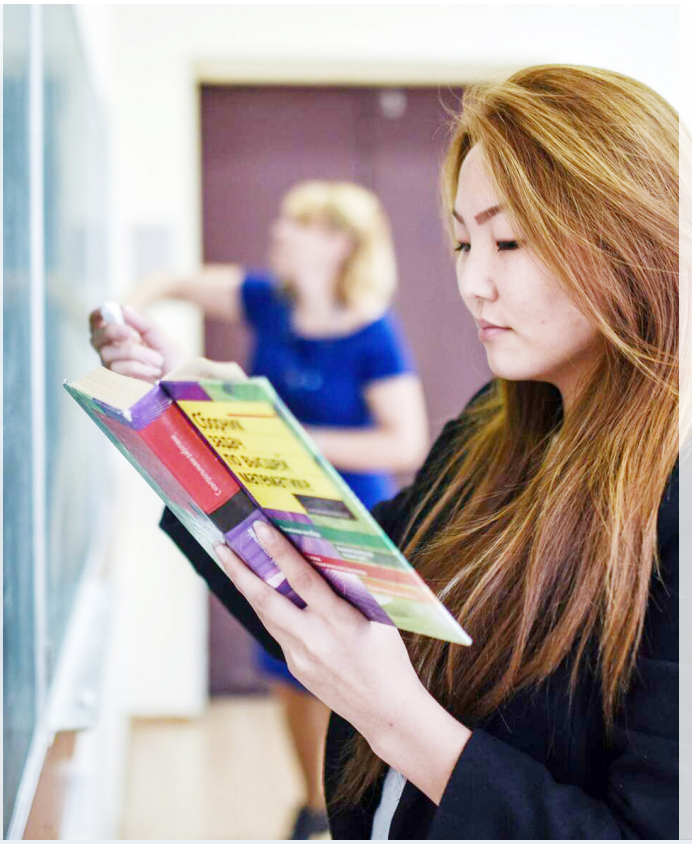
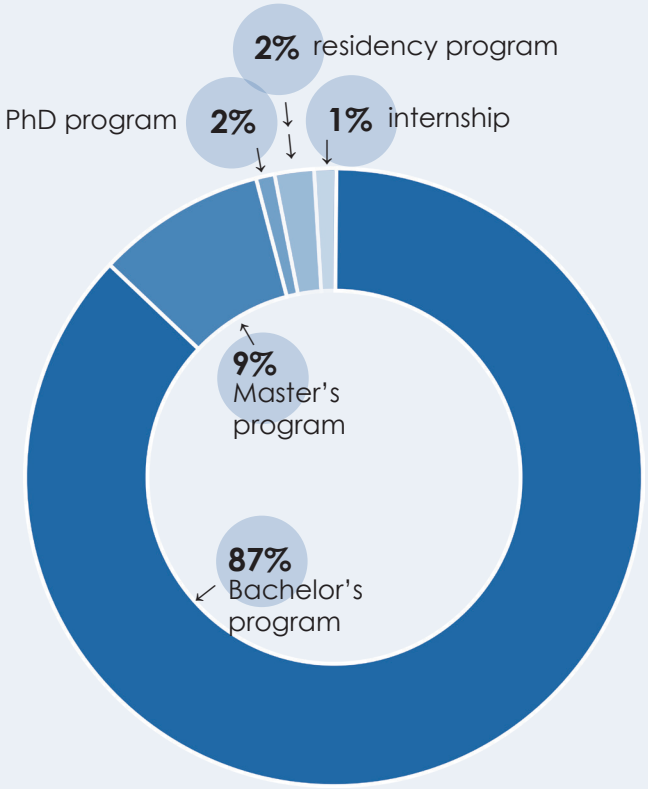


Figure 6.1.2.
Number of students in academic mobility programs by level of education, persons



In terms of funding sources over the four-year period (2021–2024), **1,962** Kazakhstani students participated in academic mobility programs financed by the state budget, while **13,771** students were funded from extrabudgetary sources.

In 2024, 92 universities implemented academic mobility programs for Kazakhstani students. Compared to 2023, the number of universities increased by 1% (91 universities in 2023). Compared to the beginning of the calendar year, the increase amounted to 4% (89 universities in the first half of 2023). (Full information is provided in Appendix 3).

In 2024, a total of **4,416 students** studied at foreign universities, which represents a slight decrease of **1%** compared to the previous year (4,**458 students** in 2023). By mode of study, **464 students** participated online, while 3,952 studied offline.

In the current year, **15 universities** in the Republic of Kazakhstan implemented online academic mobility programs for students.(Table 6.1.8.)

Kazakhstani students mainly participated in credit academic mobility programs – **4,100** students, in double-degree and joint educational programs – **83** students, in winter and summer schools – **60** students, and in internships and practical training – **173** students.

By level of education, of the total number of students in academic mobility programs,

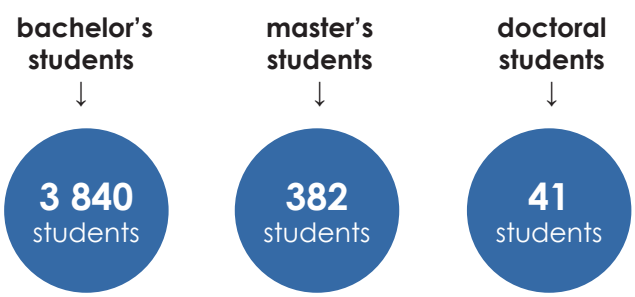


Table 6.1.9.
Academic mobility of Kazakhstani students by European countries, persons

Country	2021	2022	2023	2024
Austria	8	23	14	9
Belgium	6	24	41	15
Bulgaria	54	49	15	9
United Kingdom	14	15	19	37
Hungary	9	37	35	69
Germany	143	135	177	193
Greece	8	4	6	6
Georgia	-	4	9	9
Denmark	-	-	2	6
Israel	-	4	-	-
Spain	32	33	50	46
Italy	27	44	52	62
Cyprus	-	5	10	5
Latvia	46	64	38	46
Lithuania	72	85	93	58
Liechtenstein	1	-	-	1
Monaco	-	-	1	-
Netherlands	10	24	11	10
Norway	1	4	5	3
Poland	371	439	668	691
Portugal	-	12	2	1
Romania	22	28	18	24
Northern Cyprus	-	-	5	3
Serbia	1	3	-	1
Slovakia	4	9	6	15
Slovenia	3	10	7	11
Тьrkiye	91	482	619	792
Ukraine	235	6	6	9
Finland	4	1	5	2
France	55	101	117	112
Croatia	4	4	3	12
Czech Republic	5	45	55	85
Sweden	6	1	-	8
Switzerland	-	-	2	4
Estonia	-	2	2	6
Total	**1282**	**1695**	**2143**	**2360**

Table 6.1.10.
Academic mobility of Kazakhstani students by CIS countries, persons

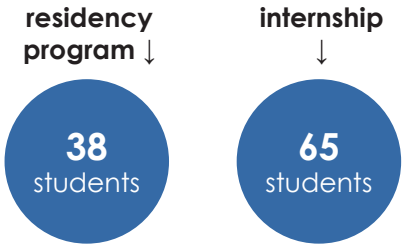
Country	2021	2022	2023	2024
Azerbaijan	33	43	42	72
Armenia	-	1	-	-
Belarus	1	21	6	15
Kyrgyzstan	84	127	243	191
Moldova	-	-	-	-
Russia	1459	1146	857	594
Tajikistan	33	9	156	1
Uzbekistan	202	255	598	529
Total	**1812**	**1602**	**1902**	**1402**

Table 6.1.11.
Academic mobility of Kazakhstani students by Southeast Asian countries, persons

Country	2021	2022	2023	2024
Vietnam	-	-	2	-
Hong Kong	-	-	3	-
Indonesia	-	35	17	17
India	-	-	-	1
China	50	79	65	190
Malaysia	31	29	44	65
Pakistan	4	-	-	-
Thailand	-	2	4	16
Taiwan	-	-	1	-
Singapore	-	4	2	5
Philippines	-	-	2	-
South Korea	51	118	151	238
Japan	3	22	35	66
Total	**139**	**289**	**326**	**598**

Table 6.1.12.
Academic Mobility of Kazakhstani Students by Middle Eastern Countries, number of students

Country	2021	2022	2023	2024
Afghanistan	3	-	-	-
Israel	-	2	9	-
Kuwait	-	-	2	-
UAE	-	-	1	-
Saudi Arabia	-	-	1	-
Total	**3**	**2**	**13**	**-**



A significant decline in the number of students at the residency level is observed, with the figure decreasing by half (2023 – 169) (Figure 6.1.2).
By region, **2,360** students studied at universities in European countries (**33** countries),

- **CIS** (6 countries) – **1402** stud.,
- **Southeast Asia** (8 countries) – **598** stud.,
- **the Middle East** – **0** stud.,
- **Africa** – **0** stud.,
- **USA** – **56** stud.

Information on all regions is provided in Appendix 4. Information on students who studied at universities of the Russian Federation is provided in Appendix 5.

A growth trend is observed in the number of students in European countries, which increased by **10%** (2,143 in 2023 and 2,360 in 2024).

В разрезе стран Европы в лидеры среди By European countries, Turkey returned to the leading position in hosting Kazakhstani students (**619** in 2023 and **792** in 2024), followed by Poland (**668** in 2023 and **691** in 2024). Germany also remains among the top three destinations, with **193** students (Table 6.1.9).

Over the four-year period, **7,480** students from Kazakhstani universities studied at universities in European countries.

In 2024, the number of students choosing universities in CIS countries decreased. The number of students fell by **26%** (1,902 in 2023 compared to 1,402 in 2024), including **427** in online programs and **975** in offline programs.

Among CIS countries, a decline is observed in the number of applicants wishing to study at universities:

- Russia (2023 – 857, 2024 г. – 594),
- Tajikistan (2023 – 156, 2024 – 1),
- Kyrgyzstan (2023 – 243, 2024 – 191),
- Uzbekistan (2023 – 598, 2024 – 529).

However, the number of applicants wishing to study increased at universities in:

- Azerbaijan (2023 – 42, 2024 – 72)
- the Republic of Belarus(2023 – 6, 2024 – 15).

Over the past four years, 6,718 students from Kazakhstani universities have studied at universities in CIS countries. (Table 6.1.10.)

The geographical coverage of the Southeast Asia region decreased (11 countries in 2023 compared to 8 in 2024). However, the number of students studying in Southeast Asian countries increased by 56% (**326** in 2023 compared to **598** in 2024), including 4 in online programs and **594** in offline programs. The majority of students in Southeast Asia study offline.

The leader among Southeast Asian countries hosting the largest number of students from Kazakhstan is

- South Korea– 238 stud.
- China – 190 stud.
- Japan – 66 stud. (Table 11).

Over the past four years, 1,352 students from Kazakhstani universities have studied at universities in Southeast Asia.

Outgoing academic mobility between Middle Eastern countries and Kazakhstan was not realized in 2024. (Table 6.1.12.)

Thus, in 2024, Kazakhstani universities demonstrated positive dynamics in implementing student academic mobility. (Table 6.1.13.)

By sources of funding, the majority of students studied:

- **1 204** stud. – non-budgetary funds of the university,

Table 6.1.13.
Academic mobility of Kazakhstani students by region, number of students

Year	Region						Total
	Europe	CIS	Southeast Asia	America	Middle East	Africa	
2021	1282	1812	139	10	3	-	3246
2022	1695	1602	289	24	2	1	3613
2023	2143	1902	326	40	13	2	4426
2024	2360	1402	598	56	0	0	4416
Total	**7480**	**6718**	**1352**	**130**	**18**	**3**	**15701**

- **207** stud. – student's own funds
- **479** stud. – mutual exchange between universities
- **1 796** stud. – foreign partner university funds
- **98** stud. – Erasmus+ program
- **93** stud. – funds from other Kazakhstani and international programs (Abai-Verne, Bolashak, DAAD, JASSO, MOPGA, STIPETI, Orkhun, DEULA-Nienburg, LOGO e.V., HAW.International)
- **5** stud. – Ministry of Culture and Information and Ministry of Health (Table 6.1.14.)

In terms of fields of education, the majority of Kazakhstani students studied Pedagogical Sciences – **1,002** students, while the fewest studied Veterinary Sciences – **19** students.

01 | Pedagogical Sciences – **1,002** students (Top 3 countries: Turkey – 311, Poland – 263, Uzbekistan – 83)

02 | Humanities and Arts – **510** students (Top 3 countries: South Korea – 93, China – 68, Poland – 52)

03 | Social Sciences – **335** students (Top 3 countries: Poland – 89, Turkey – 75, Russia – 20)

04 | Business, Management, and Law – **603** students (Top 3 countries: Russia – 85, Turkey – 56, Poland – 55)

05 | Natural Sciences– **205** students (Top 3 countries: Poland – 44, Turkey – 36, Russia – 28)

06 | Information and Communication Technologies (ICT) – **327** students (Top 3 countries: Poland – 63, Germany – 44, Turkey – 43)

07 | Engineering, Manufacturing, and Construction – **523** students (Top 3 countries: Russia – 147, Uzbekistan – 58, Kyrgyzstan – 33)

08 | Agricultural Sciences – **28** students (Germany – 18)

Table 6.1.14.
Funding Sources for Academic Mobility of Kazakhstani Students, number of students

Funding Source	2021	2022	2023	2024
Student's own funds	1732	943	1435	207
Budget of the MSHE RK	350	516	525	534
University funds	332	698	1153	1204
Erasmus+	97	151	59	98
Other Kazakhstani and international grant programs	480	303	87	93
Mutual exchange	210	866	1029	479
Foreign university	34	75	87	1796
Ministry of Culture and Information, Ministry of Health of RK	11	61	51	5
Итого	**3246**	**3613**	**4426**	**4416**

09 | Veterinary Sciences – **19** students (Germany – 14)

10 | Health and Social Care (Medicine) – **701** students (Top 3 countries: Uzbekistan – 292, Russia – 192, Azerbaijan – 28)

11 | Services– **163** students (Top 3 countries: Turkey – 27, Poland – 22, Russia – 20)

When comparing the fields of study of Kazakhstani and foreign students who participated in academic mobility, some interesting trends and differences in program choices can be observed.

In outgoing mobility, **Pedagogical Sciences** remain the largest field, while in incoming mobility, **Business, Management, and Law** account for the highest number of students. It is important to note that the majority of students in these fields come from Turkey and Kyrgyzstan. Kazakhstani students, in turn, prefer to study at universities in Turkey, China, and Russia.

Thus, the analysis highlights differences in study directions between students participating in mobility programs. While most foreign students choose **Pedagogical, Humanities, and Social Sciences, and Business, Management, and Law**, Kazakhstani students primarily study **Health, Pedagogical Sciences, and Engineering** fields.

In 2024, Kazakhstani universities identified several challenges in implementing academic mobility for students::

- **Mismatch of study programs** with the partner foreign university;
- **Visa procedures** (lack of available appointments, delays in visa issuance);
- **Inability to reallocate funds** within state budget expense items;
- **Language barrier** – most Kazakhstani students do not have sufficient foreign language proficiency.

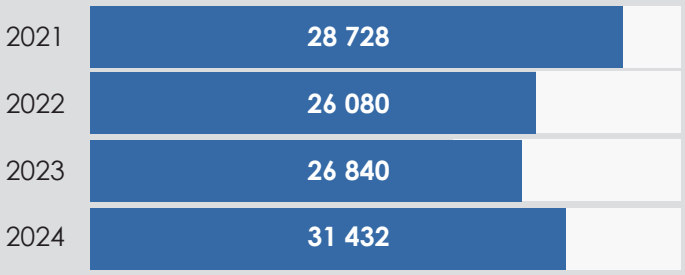
International students (full-time)

In the 2024 academic year, **31,432 foreign students from 93 countries** are studying at **99 universities in Kazakhstan** (representing **96% of the 103 civilian universities**). Compared to the same period in 2023, the number of international students has increased by **15%, and their share has grown by 5.3%**. (Figure 6.1.3)

Annually, the largest number of students is enrolled in:

- **state non-profit joint-stock companies** with 100% government participation (28 out of 29) – **11,774** stud. (2023 – 21,842 stud.),
- **national universities** (11 из 11) – **10 569** stud. (2023 - 8,300 stud.)

Figure 6.1.3.
Number of foreign students, persons



Source:

- **private universities** (42 из 44) – **5707** stud. (2023 - 4,376 stud.)
- **joint-stock companies** (16 из 16) – **2388** stud. (2023 - 2314)
- **international universities** – **994** чел. (2023 – 1,096 stud.) (Appendix 8)

Below are the universities where no foreign students are enrolled:

- Kazakhstan Medical University "Higher School of Public Health"
- Karaganda Industrial University
- Kostanay Engineering and Economics University named after Dulatov
- Shymkent University

By level of education, the **largest share of foreign students is enrolled in bachelor's programs — 90% (28,552 students)**.

The number of undergraduate students increased by **15%** compared to 2023 (24,410 students).

Number of students
- **1st year** – **7680** stud.
- **2st year** – **6749** stud.
- **3st year** – **5079** stud.
- **4st year** – **5933** stud.
- **5st year** – **3067** stud.
- **6st year** – **31** stud.
- **7st year** – **13** stud.

Согласно анализу 13% студентов первокурсников не продолжили свое обучение. Таким образом, количество студентов, прошедших на второй курс составило **6748** чел. из **7678** чел.

In **master's programs,** 1,510 students are enrolled — a 37% increase compared to the previous year (2023 – 954 students).
- **1st year** – **1080** stud.
- **2st year** – **429** stud.
- **3st year** – **1** stud.

In **doctoral** programs, 242 students are enrolled (2023 – 116), including
- **1st year** – **143** stud.
- **2st year** – **61** stud.
- **3st year** – **38** stud.

Number of students:

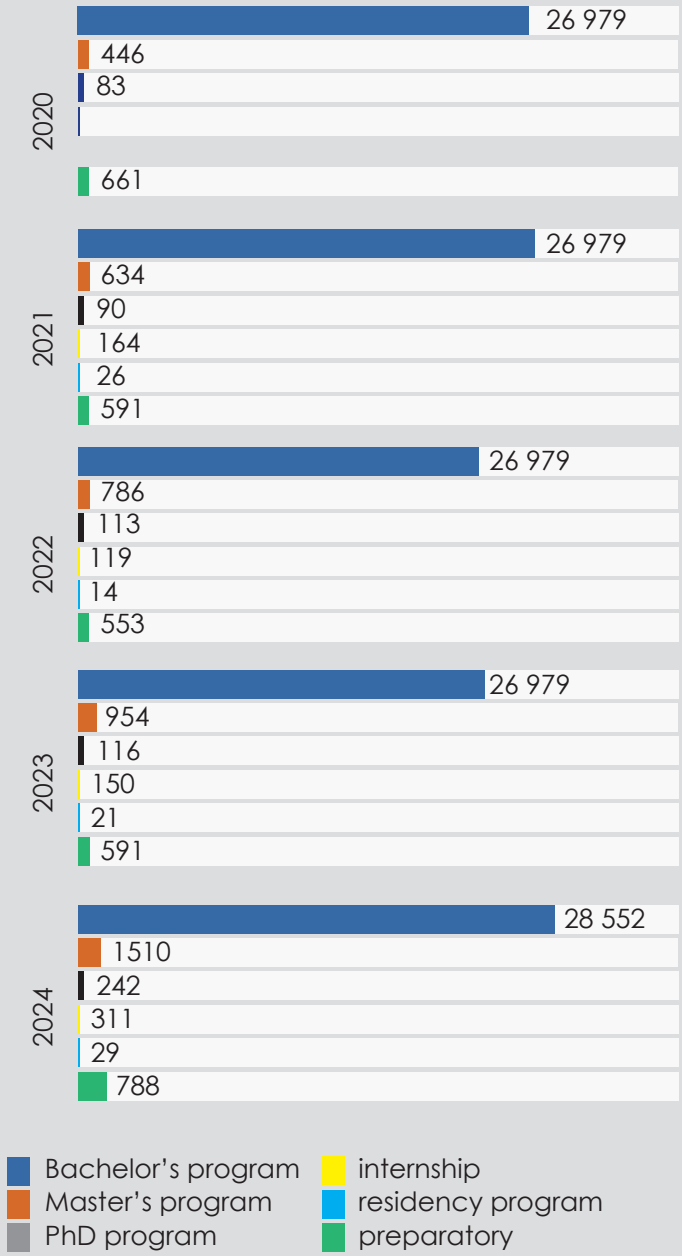
The **number of graduates in 2024** totals **4,725,** which is **1.5 times lower than in 2023** (2023 – 7,183). Of these:
- **Bachelor's graduates** – **3911** (2023 – 5586 stud.),
- **Master's graduates** – 266 (2023 – 365 stud.),
- **Doctoral graduates** – 6 (2023 – 44 stud.),
- **internship** – 167 stud.,
- **residency program** – 14 (2023 – 5 stud.),
- **Preparatory program graduates** – 361 (2023 – 1110 stud.) (Figure 6.1.4.).

As of 2024, the number of students in preparatory departments is **788**, of which:
- **funded by the state budget** – **229** stud.
- **funded from the students' own funds** – **328** stud.
- **TTE grant** – **231** stud.

Since 2022, universities have independently conducted the selection of applicants for preparatory programs at institutions of higher and/or postgraduate education in the Republic of Kazakhstan. Each year, **1,550 state-funded places** are allocated for preparatory courses for foreign citizens.

The **state educational order for the 2024 academic year** is distributed as follows:
- ethnic Kazakhs who are not citizens of the Republic of Kazakhstan – **1300** places;
- other foreign citizens – **50** places;

Figure 6.1.4.
Number of foreign students by level of education, persons



- citizens of the Republic of Tьrkiye and other Turkic-speaking countries – **200** places.

A total of **2,425 applications** were submitted to the Center's website, including:

- Kazakh ethnic persons, non-citizens of Kazakhstan – **1934**;
- other foreign citizens – **149**;
- for citizens of the Republic of Turkey and other Turkic-speaking republicsк – **216**.

By country of origin, in 2024 the number of students from Asian countries exceeded that of students from CIS countries, primarily due to the increase in students from India (Figure 6.1.6).

It is worth noting that the number of students from **CIS countries** has continued to grow: **13,323 in 2022, 12,769 in 2023, and 12,816 in 2024.**

At the same time, the number of students from **European countries** decreased by **14% (160 in 2022, 500 in 2023, 434 in 2024).**

A **35% decline** was also observed among students from the **Middle East (785 in 2023, 362 in 2024)** (Figure 6.1.5.).

In the 2024 academic year, **India became the leading country** in terms of the number of students studying at universities in Kazakhstan, totaling **12,020 students**. In the 2022–2023 academic year, this figure was **21% lower**, amounting to **9,517 students**.

The **majority of Indian students** are enrolled in **medical specialties — 11,997 out of 12,020** (Table 6.1.15.).

By CIS countries, in 2024 the number of citizens from:

- **Russia** increased by **41%** (2023 – **1,795;** 2024 – **3,005**)
- **Turkmenistan** increased by **31%** (2023 – **2,750;** 2024 – **3,962**)

Figure 6.1.5.
Number of foreign students by region, persons

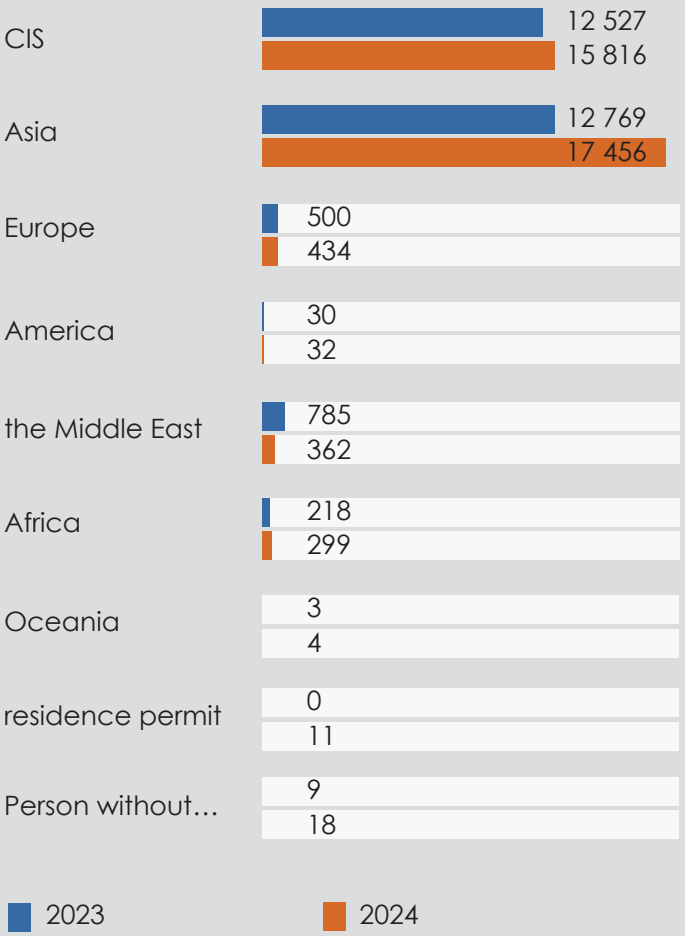


Table 6.1.15.
Number of foreign students from India in medical specialties, persons

Name of the university	Total number of students	Of these, Indian citizens
West Kazakhstan Medical University named after M. Ospanov	811	686
Kazakh National Medical University named after S. Asfendiyarov	2816	2194
Kazakh-Russian Medical University	555	205
Al-Farabi Kazakh National University	4042	483
Caspian Public University	1368	1284
Kokshetau University named after Sh. Ualikhanov	357	274
Astana Medical University	459	267
Karaganda Medical University	3054	2746
Semey Medical University	974	536
North Kazakhstan University named after M. Kozybayev	175	75
University of International Business	829	767
South Kazakhstan Medical Academy	2664	2480
Total	**18 104**	**11 997**

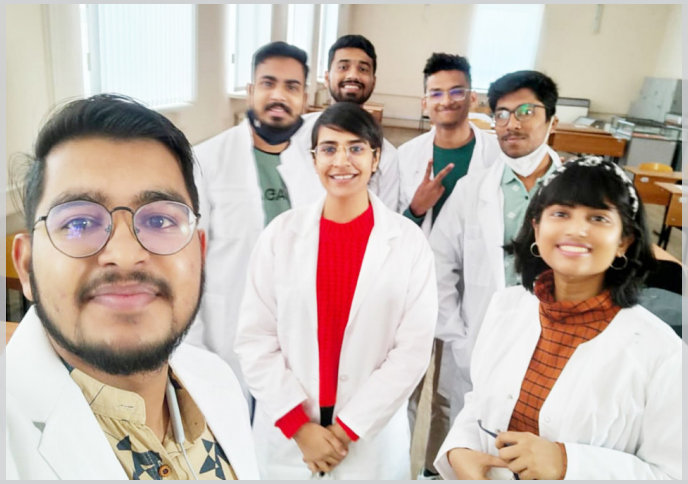
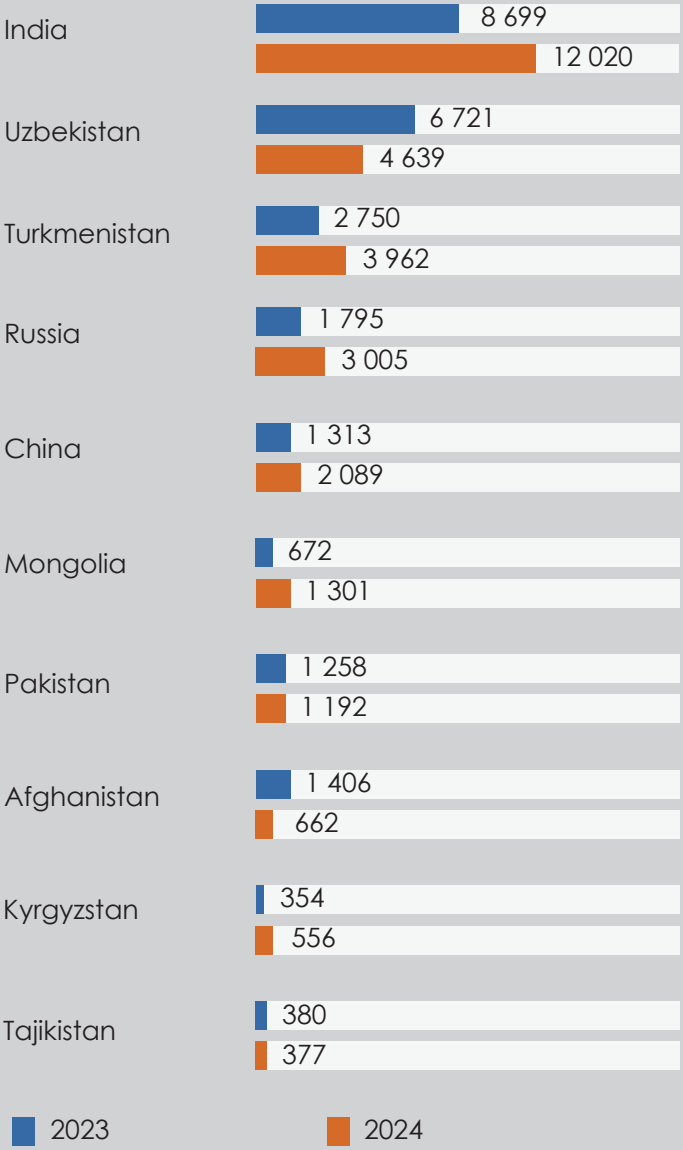


Figure 6.1.6.
Number of foreign students by TOP-10 countries, persons



There is also an increase in the number of students

- **Azerbaijan** (2023 – **160**, 2024 – **222**), an increase of 28%

However, a decrease in students from

- **Uzbekistan** is observed by **31%** (2023 – **6,721**; 2024 – **4,639**).

Among **Middle Eastern countries**, a decline in student numbers was observed:

- **Jordan** – a **42%** decrease (2023 – **267**; 2024 – **156**)
- **Iraq** – **38%** decrease (2023 – **56**; 2024 – **35**)
- **Syria** – **88%** decrease (2023 – **39**; 2024 – **5**).

In the African region, the geographical diversity of students expanded from 22 to 26 countries over the past year. The leading **African** countries are

- Egypt (74 students)
- Nigeria (85)
- Tanzania (20)
- Kenya (20).

Across Asian countries, there is a general upward trend. The number of students

- from **China** increased by **37%** (2023 – **1,313**; 2024 – **2,089**)
- from **Afghanistan** by **47%** (2023 – **354**; 2024 – **662**)

The number of students

- from **South Korea** decreased by **19%** (2023 – **53**; 2024 – **43**).

New international students joined

- from **Sri Lanka** (2023 – **0**; 2024 – **4**).

However, the number of students

- from **Pakistan** decreased by **16%** (2023 – **1,406**; 2024 – **1,192**).

10 стран-лидеров по количеству обучающихся в вузах РК, из них

- **стран СНГ** – **5**,
- **Азии** – **4**,
- **Ближнего Востока** – **1**.

(Figure 6.1.6.).

Among universities, the **annual leaders** in terms of the number of foreign students are the **M. Auezov South Kazakhstan University**, the **Al-Farabi Kazakh National University**, and the **S. Asfendiyarov Kazakh National Medical University**.

However, the number of students at **M. Auezov South Kazakhstan University** and **S. Asfendiyarov Kazakh National Medical University** has decreased. (Figure 6.1.7.).

Based on student enrollment, universities distinguished by the diversity of countries of origin include:

- **Al-Farabi Kazakh National University (KazNU)** – students from 54 countries
- **Kazakh-British Technical University (KBTU)** – from 28 countries
- **KIMEP University** – from 26 countries
- **L.N. Gumilyov Eurasian National University (ENU)** – from 25 countries.

The analysis shows that, by source of funding, **83%** of foreign students study at their own expense or through various grants, while **17%** are funded by the state budget of the Republic of Kazakhstan, including through the Scholarship Program, intergovernmental agreements, ministerial quotas, and grants from local authorities. (Table 6.1.16.).

In 2024, 4,580 foreign students are funded by the state budget. Of these:

- are enrolled under the **Scholarship Program for foreign citizens**, including **ethnic Kazakhs who are not citizens of the Republic of Kazakhstan** – **693** stud.,
- are enrolled in **preparatory programs** – **1061** stud.,
- study under **intergovernmental agreements** – **110** stud.,
- are funded by **local executive authorities** – **61** stud.,
- study through **state budget quotas** – **2124** stud.
- receive **grants from Kazakhstani universities** – **267** stud.

In terms of regions of Kazakhstan, the leader in the number of international students annually is

- **Almaty city** (46.2%), since 34 out of 103 universities are located in Almaty
- 14% of international students study in **Shymkent city** (4,489 people),
- The smallest number is in **Atyrau region** – 94 people (0.2%) (Figure 6.1.8).

The most popular field of education among international students each year is **Health and Social Welfare (Medicine)**.

- «**Education**» – **4067**
- «**Humanities and Arts**» – **1456**
- «**Social Sciences and Journalism**» – **797**
- «**Business, Management and Law**» – **3371**
- «**Natural Sciences**» – **855**
- «**Information and Communication Technologies**» – **1693**
- «**Engineering, Manufacturing and Construction**» – **2113**
- «**Agricultural Sciences**» – **181**
- «**Veterinary Medicine**» – **47**
- «**Health and Social Welfare** (Medicine)» – **15 537**
- «**Services**» – **500**
- «**National Security**» – **4**
- **Preparatory Courses** – **811**

Compared to the same period in 2023, the number of students enrolled in the field of **Health and Social Welfare** (Medicine) increased by **22%** (in 2023 – **12,229 students**).

In terms of the choice of study fields, the following trends can be observed. Most students from **European** countries choose :

Figure 6.1.7.
TOP-5 leading universities by number of foreign students in 2023, persons

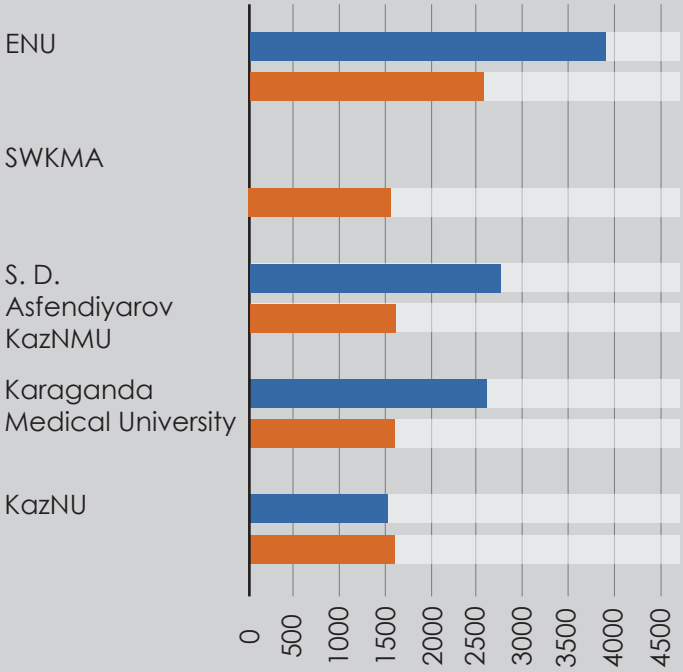


Table 6.1.16.
Number of foreign students by source of funding, persons

Year	Budget	Extra-budgetary
2024	4 316	27 116
2023	4 580	22 260
2022	4 691	21 389
2021	3 766	24 962
2020	4 225	23 943
2019	4 517	35 671
2018	2 470	17 630

- 10 **Health and Social Welfare** (Medicine) (only students from Turkey)
- 04 **Business, Management and Law** (Germany)
- 02 **Humanities** (Germany)
- 03 **Social Sciences** (France, Spain)

Students from **CIS** countries tend to prefer :

- 01 **Education** (Uzbekistan, Turkmenistan)
- 04 **Business, Management and Law** (Kyrgyzstan)
- 7 **Engineering** (Russia).

African students mainly study in

- 06 **Information and Communication Technologies**
- 10 **Health and Social Welfare** (Medicine).

Students from **Asian** countries most often choose:

- 10 **Health and Social Welfare** (Medicine) (India, Pakistan)
- 04 **Business, Management and Law** (Afghanistan, South Korea)
- 01 **Education** (China, Mongolia)

This year, Kazakhstani universities have encountered the following challenges in attracting and educating international students:

- a low proportion of teaching staff proficient in foreign languages;
- a lack of awareness among foreign citizens about Kazakhstani universities;
- low attractiveness of the region where a Kazakhstani university is located for students from distant countries;
- difficulties in finding housing in the city of Almaty;
- migration-related procedures for students;

- weak communication with prospective international applicants;
- shortage of dormitory spaces;
- financial and political crises in the countries whose citizens are awarded scholarships under the Scholarship Program;
- difficulties with the arrival of students from Turkmenistan;
- financial difficulties faced by international students.

This year, India has taken the leading position among countries in terms of the number of students choosing universities in Kazakhstan. A shift in preferences is also observed among CIS countries — more students from Russia and Uzbekistan are now choosing Kazakhstani universities.

The geographical diversity of incoming students has also changed. In particular, countries of the Middle East and Africa are reconsidering their preferences in favor of education in Kazakhstan. On the other hand, Asian countries are showing a growing trend in the number of students, highlighting the increasing attractiveness of the region's educational programs.

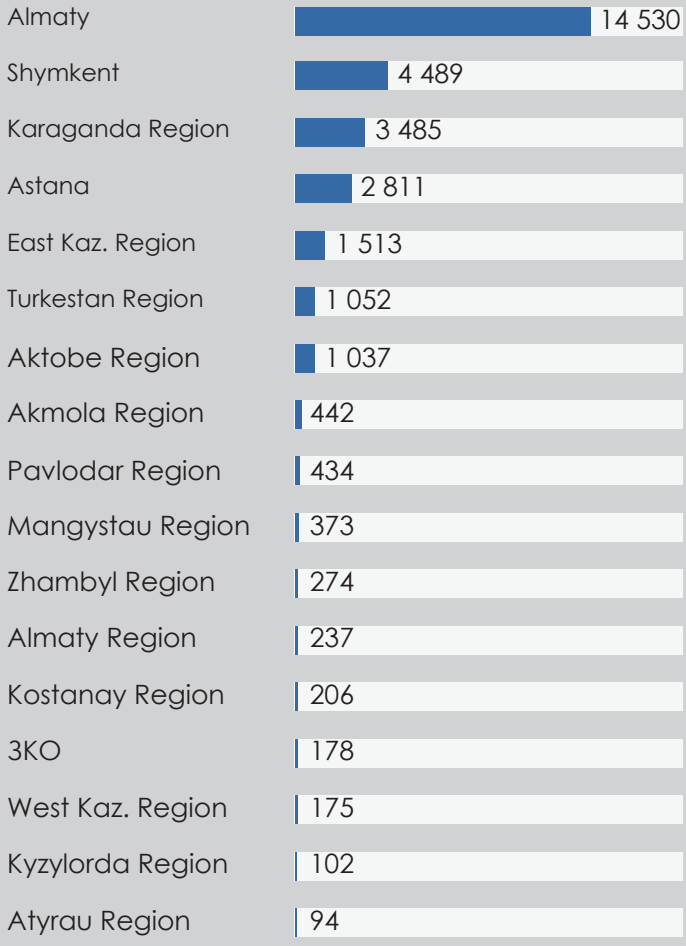
Academic Mobility of Faculty and Teaching Staff

Academic exchange of faculty and teaching staff (FTS) is carried out through the secondment of Kazakhstani FTS to foreign universities. In 2024, **769** Kazakhstani FTS from **73** universities participated in academic exchanges at **287** foreign universities across **47** countries.

There is a noticeable increase in the total number of participants, from **614 in 2023** to **769 in 2024**, representing a growth of **155** people (Table 6.1.15).

Compared to 2023, there was a sharp rise in participation from national universities, tripling from 43 to **124 in 2024**. Participants

Figure 6.1.8.
Number of foreign students by regions of the Republic of Kazakhstan, persons



from public universities also showed significant growth, from 190 (2023) to **343 (2024)**. Conversely, participation from private universities decreased noticeably, from 248 participants in 2023 to 176 in 2024. (Table 6.1.17.), (Figure 6.1.9.)

Teaching Formats of Kazakhstani Academic Staff

In 2024, 607 participants chose the offline format for academic exchange, an increase compared to 402 participants in 2023. There was a notable change in the number of participants opting for the online format: in 2024, 116 participants took part online, significantly fewer than the 186 participants in 2023. The blended format, which combines elements of online and offline learning, also showed changes. This year, 46 participants selected the blended format, 20 more than the 26 participants in 2023. This increase may indicate a growing popularity of hybrid learning formats. (Table 6.1.18).

Countries Participating in Academic Exchange

Kazakhstani faculty members most frequently participated in academic

Figure 6.1.9.
Number of Academic Exchanges of Kazakhstani Faculty and Teaching Staff (FTS) in 2023–2024 by Type of University

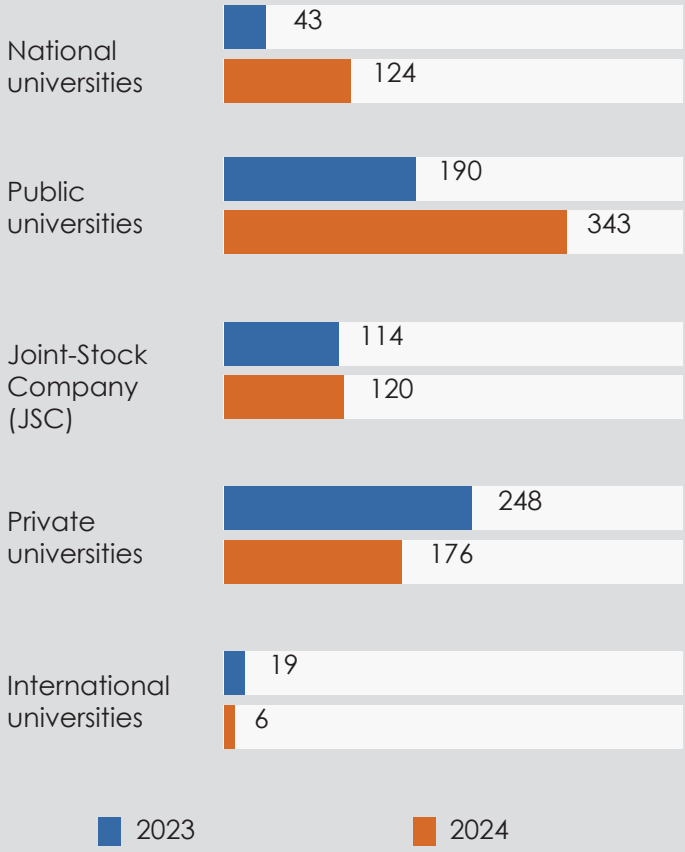


Table 6.1.17.
Number of Academic Exchanges of Kazakhstani Faculty and Teaching Staff (FTS) in 2023–2024 by University Type

Type of University	Number in 2024	Share	Number in 2023	Share
National Universities	124	16.1%	43	7%
State Universities	343	44.6%	190	30.9%
Joint-Stock Universities	120	15.6%	114	18.6%
Private Universities	176	22.9%	248	40.4%
International University	6	0.8%	19	3.1%
Total	**769**		**614**	

exchanges to CIS countries such as Uzbekistan, Kyrgyzstan, and Russia. Among these, Uzbekistan was the leader both in 2023 (116 participants) and 2024 (160 participants).

Among European countries, the largest number of Kazakhstani faculty members, as in the previous year, went to Turkey and Poland (58 and 42 participants, respectively). The smallest number of participants—only one person—traveled to several countries. These low-participation countries include Mongolia, Japan, Slovenia, Australia, Qatar, Romania, Hungary, Israel, Moldova, Turkmenistan, Switzerland, and Ecuador, indicating relatively low academic exchange activity between Kazakhstan and these nations. (Table 6.1.19)

Compared to 2023, the number of countries participating in academic exchange increased by 14 (2024 – 47, 2023 – 33) (Table 6.1.20)

Some countries that participated in the exchange program in 2023 did not take part in 2024. These include Norway, Saudi Arabia, and Egypt.

At the same time, new participants appeared in 2024 that were not part of the program the previous year. These include Hungary, Greece, Denmark, Moldova, Serbia, Slovakia, Thailand, Turkmenistan, Switzerland, Ecuador, and South Korea.

Качественный состав казахстанского ППС

По качественному составу среди казахстанских участников программ академического обмена преобладают кандидаты наук (Таблица 6.1.19.). Их количество составило **252** человека. Это составляет около 32.8% от общего числа всех участников обмена.

Количество докторов PhD также значительно. В 2024 году их было **187** человек (24.3% от общего числа участников). Сравнивая эти данные с показателями 2023 года, следует отметить рост количества докторов PhD с 110 до **187** человека. Увеличилось и количество докторов наук (с **68** до **72** чел.).

Магистры, представляющие еще одну значительную часть участников обмена, составили в 2024 году **211** человек (в 2023 году **152** чел.). Необходимо при этом отметить значительное сокращение числа участников без степени (с **68** в 2023 году до **47** в 2024 году) (Таблица 6.1.21.).

The qualitative composition of Kazakhstani teaching staff

In terms of the qualitative composition of Kazakhstani participants in academic

Table 6.1.18.
Number of Academic Exchanges of Kazakhstani Academic Staff in 2023–2024 by Teaching Format

Teaching Format	Number in 2024	Share	Number in 2023	Share
Offline	607	79%	402	65.5%
Online	116	15%	186	30.3%
Blended	46	6%	26	4.2%

Table 6.1.19.
Number of Kazakhstani faculty members participating in academic exchange by country

Country	Number in 2024	Share	Number in 2023	Share
Uzbekistan	160	0,8%	69	11.2%
Kyrgyzstan	125	15,6%	148	24.1%
Russia	123	16%	132	21.5%
Turkey	58	7.5%	58	9.4%
Poland	42	5.5%	24	3.9%
Germany	36	4.7%	29	4.7%
China	32	4.2%	22	3.6%
Azerbaijan	17	2.2%	2	0.3%
USA	16	2.0%	2	0.3%
Czech Republic	8	1.0%	2	0.3%
Spain	7	0.9%	10	1.6%
Lithuania	8	1.0%	12	2.0%
Tajikistan	13	1.7%	18	2.9%
France	15	1.9%	8	1.3%
Mongolia	1	0,1%	5	0.8%
United Kingdom	17	2.2%	4	0.7%
Japan	1	0,1%	-	-
Belarus	9	1.1%	3	0.5%
Bulgaria	4	0.5%	-	-
Vietnam	2	0.3%	-	-
Latvia	3	0.4%	-	-
Slovenia	1	0,1%	6	1.0%
Portugal	2	0,3%	3	0.5%
Austria	2	0,3%	2	0.3%
Australia	1	0,1%	1	0.2%
India	2	0,3%	1	0.2%
Qatar	1	0,1%	-	-
Belgium	2	0,3%	7	1.1%
Romania	1	0,1%	9	1.5%
Netherlands	2	0,3%	6	1.0%
Georgia	2	0,3%	7	1.1%
Indonesia	3	0.4%	4	0.7%
Norway	-	-	2	0.3%
Saudi Arabia	-	-	2	0.3%
Egypt	-	-	1	0.2%
Italy	1	1.4%	3	0.5%
Croatia	5	0.6%	2	0.3%
Sweden	6	0.8%	1	0.2%
Hungary	1	0.1%	-	-
Greece	0	1.3%	-	-
Denmark	2	0,3%	-	-
Israel	1	0,1%	-	-
Moldova	1	0,1%	-	-
Serbia	3	0.4%	-	-
Slovakia	2	0,3%	-	-
Thailand	2	0,3%	-	-
Turkmenistan	1	0,1%	-	-
Switzerland	1	0,1%	-	-
Ecuador	1	0,1%	-	-
South Korea	6	0.8%	-	-
Total	**769**		**614**	

Table 6.1.19.
Number of Kazakhstani faculty members participating in academic exchange by country

Table 6.1.20.
Number of countries participating in academic exchange in 2023–2024

Country 2024	Country 2023
Uzbekistan	Uzbekistan
Kyrgyzstan	Kyrgyzstan
Russia	Russia
Turkey	Turkey
Poland	Poland
Germany	Germany
China	China
Azerbaijan	Azerbaijan
USA	USA
Czech Republic	Czech Republic
Spain	Spain
Lithuania	Lithuania
Tajikistan	Tajikistan
France	France
Mongolia	Mongolia
United Kingdom	United Kingdom
Japan	-
Belarus	Belarus
Bulgaria	-
Vietnam	-
Latvia	-
Slovenia	Slovenia
Portugal	Portugal
Austria	Austria
Australia	Australia
India	India
Qatar	-
Belgium	Belgium
Romania	Romania
Netherlands	Netherlands
Georgia	Georgia
Indonesia	Indonesia
-	Norway
-	Saudi Arabia
-	Egypt
Italy	Italy

Table 6.1.20.
Number of countries participating in academic exchange in 2023–2024

Country 2024	Country 2023
Croatia	Croatia
Sweden	Sweden
Hungary	-
Greece	-
Denmark	-
Israel	-
Moldova	-
Serbia	-
Slovakia	-
Thailand	-
Turkmenistan	-
Switzerland	-
Ecuador	-
South Korea	-
47 countries	**33 countries**

Table 6.1.21.
Qualitative Composition of Kazakhstani Faculty, number of persons

Academic Degree	2024	Share	2023	Share
PhD	187	24.3%	110	18%
Doctor	72	9.4%	68	11.1%
Candidate	252	38%	216	35.2%
Master's	211	27.4%	152	24.8%
No degree	47	6.1%	68	11.1%
Total	**769**		**614**	

exchange programs, candidates of sciences constitute the majority. Their number reached **252**, making them the largest group, which accounts for approximately **32.8%** of all participants.

The number of PhD holders is also significant, totaling **187 in 2024**, which corresponds to **24.3%** of all participants. Compared to 2023, there has been an increase in the number of PhD holders from **110** to **187**. Additionally, the number of doctors of sciences rose from **68** to **72**.

Masters, representing another substantial portion of participants, increased from **152 in 2023** to **211 in 2024**. It is also noteworthy that the number of participants without a degree decreased significantly, from **68 in 2023** to **47 in 2024**. (Table 6.1.21)

Specialization Areas of Kazakhstani Faculty

Comparing the data for the first half of 2023 and 2024, the following observations can be made:

The largest number of participants was in the field of Education Sciences, with **171** specialists, which is significantly higher than the **92** participants in 2023. In 2024, the highest number of Kazakhstani participants in academic exchange programs was in Education Sciences, with **171** participants.

The lowest number of participants in 2024 was observed in Veterinary and Services (**13 and 24 persons**, respectively), as was the case in the previous year. (Table 6.1.22)

Faculty Academic Exchange Programs

Comparing the data for the first half of 2023 and 2024, the following conclusions can be drawn (Table 6.1.22)

Academic mobility of faculty members was carried out through the placement of Kazakhstani instructors in foreign universities. In 2024, **769 faculty** members from 73 domestic universities participated

Table 6.1.22.
Distribution of Kazakhstani Teaching Staff Participants in Academic Exchange by Field of Study, %

Field of Education	2024	Share	2023	Share
01 | Education Sciences	171	22.2%	92	15%
02 | Arts and Humanities	44	5.7%	51	8,3%
03 | Social Sciences, Journalism, and Information	54	7%	35	5.7%
04 | Business, Management, and Law	112	14.6%	157	25,6%
05 | Natural Sciences, Mathematics, and Statistics	37	4.8%	30	4.9%
06 | Information and Communication Technologies	44	5.7%	28	4.6%
07 | Engineering, Manufacturing, and Construction	93	12%	79	12,9%
08 | Agriculture and Bioresources	53	6.9%	9	1.5%
09 | Veterinary	13	1,7%	1	0.2%
10 | Health Care	124	16,1%	110	17.9%
11 | Services	24	3,1%	22	3.6%
Total	**769**		**614**	

Table 6.1.23.
Number of countries participating in academic exchange in 2023–2024

Program	2024 year
Interuniversity Agreement	269
Grants / Free of Charge	14
University's Non-Budgetary Funds	64
University Funds	215
State Budget	37
Erasmus+	76
Bolashak	52
Orkhun Program	9
Project-Based Funding	19
Nonprofit Educational Organization Co-Serve International	1
Fulbright Visiting Scholar Program	1
Hosting Party "Korea Foundation"	1
Embassy of the Kingdom of Thailand in Astana	2
DAAD	6
Building Educational and Research Capacities in Nutrition and Dietetics in Central Asia/ BERNICA	1
i5 Lego foundation	2
Total	**769**

in academic exchanges at **287 foreign** universities across **47 countries.** Compared to 2023 (**614** participants), the total number of participants increased by 155. Particularly notable is the growth in representatives from national universities—their number tripled from **43** to **124**. Participation of faculty from state universities also increased, from **190** to **343**. At the same time, the number of participants from private institutions decreased from **248** to **176**.

The vast majority of exchanges in 2024 took place in the offline format—**607 participants**. The number of participants in the online format decreased from **186 in 2023** to **116 in 2024.** The number of participants in blended formats increased from **26** to **46**, which may indicate a growing interest in combined formats of teaching and exchange.

The most popular destinations for academic exchanges among CIS countries remain Uzbekistan, Kyrgyzstan, and Russia. As in the previous year, Uzbekistan became the leader in hosting participants, with an increase from **116 in 2023** to **160 in 2024**.

From the perspective of academic fields, in 2024 the largest number of participants in academic exchanges represented the field of pedagogical sciences, reflecting the strategic priority of this area.

Exchanges were predominantly conducted based on inter-university agreements, as well as with participation in the **Erasmus+** and **Bolashak** programs.

Overall, despite the reduction in the number of participants from certain types of universities, academic exchange remains a significant mechanism for integrating Kazakhstan's higher education system into the international scientific and educational space and contributes to the professional and cultural development of faculty members.

6.2. Joint and Double-Degree Educational Programs

The procedure for including Joint Educational Programs (JEPs) and Double-Degree Programs (DDPs) in the Registry of Higher and Postgraduate Education Programs involves a sequence of procedural and content-related steps. At the first stage, a program passport is prepared, specifying the field of education, the area of training, and the group of educational programs according to the current classifier. The code and title of the program are indicated, and its objective is formulated to meet the criteria of relevance, specificity, and feasibility. The type of program—existing, new, or innovative—is defined, as well as its level according to national and sectoral qualification frameworks. The passport records the distinctive features of the program, the awarded degree, the credit volume, and the language of instruction; if applicable, alignment with professional standards is indicated.

Information about the partner organization is prepared, specifying its type (domestic or foreign), name, and whether the program belongs to the category of joint or double-degree programs. Inclusion in the Registry requires an attachment to the license for the relevant field of study and valid accreditation.

The content section includes a description of the program structure and content: the date of approval by the Academic Council, learning outcomes in three languages, a list of courses with brief descriptions, indicating the cycle, component type (core or elective), number of credits, and alignment of learning outcomes with the curriculum. If applicable, the program is mapped to the Atlas of New Professions with a mandatory reference to the source.

The program is entered into the Registry via an application submitted by one of the participating universities with mandatory indication of the partner; the program is reflected in both universities. Expert review is conducted once—upon inclusion and during subsequent updates. A key requirement is the completeness and reliability of the information provided, the absence of duplicate or contradictory data, and the program's alignment with the declared field of education and code.

The final element is ensuring systematic monitoring and updating of information. Regular updates to the content of educational programs are expected, considering modern technologies and teaching methods, as well as the inclusion of professional certification courses where possible. Updated information is promptly entered into the "Registry of HE Programs," contributing to greater transparency and quality in the implementation of joint and double-degree educational programs.

In 2024, 361 double-degree programs implemented by Kazakhstani higher and/or postgraduate education institutions in cooperation with domestic and foreign partners were included in the Registry of Higher and Postgraduate Education Programs. The highest concentration of DDPs is observed in leading national universities, reflecting their active role in developing academic integration and internationalization of the educational process.

60 programs
Al-Farabi Kazakh National University

37 programs
L.N. Gumilyov Eurasian National University

14 programs
Kazakhstan-Germany University

15 programs
North Kazakhstan M. Kozybayev University

10 programs
KAZGUU University

16 programs
Abai Kazakh National Pedagogical University

16 programs
Университет Международного Бизнеса им. К.Сагадиева

The leading positions are held by: Regional and sectoral universities make a significant contribution to the implementation of double-degree programs.

7 programs
D. Serikbayev East Kazakhstan Technical University

7 programs
Sh. Esenov Caspian University of Technology and Engineering

8 programs
Akhmet Baitursynuly Kostanay Regional University

13 programs
M. Auezov South Kazakhstan University

The broad representation of universities in implementing DDPs indicates the widespread practice of bilateral and multilateral academic cooperation across the country. At the same time, the significant concentration of such programs in a limited number of leading universities points to the need to expand the participation of regional universities in creating double-degree educational trajectories. This would ensure a more equitable distribution of academic opportunities, enhance international interaction, and strengthen the competitiveness of graduates in the global labor market.

In the field of pedagogical sciences, several double-degree programs have been included in the Registry, reflecting both existing and new directions of cooperation between domestic and foreign universities. These programs cover a wide range of training profiles—from natural sciences and languages to pedagogy and psychology, special pedagogy, and physical education.

Among existing programs:

ECTS (Master's program) **Computer Science**

Sarsen Amanzholov East Kazakhstan University	Altai State University (Russia)

ECTS (Doctoral program) **Educational Measurements**

Abai Kazakh National Pedagogical University	Yogyakarta State University (Indonesia)

ECTS (Master's program) **Primary Education and Teaching Methods**

Karaganda University named after Academician E.A. Buketov	K. Karasaev Bishkek State University (Kyrgyzstan)

ECTS (Master's program) **Pedagogy and Psychology: Educational Measurements**

Abai Kazakh National Pedagogical University	Moscow City Pedagogical University (Russia)

ECTS (Master's program) **Kazakh Language and Literature**

Karaganda University named after Academician E.A. Buketov	Kastamonu University (Turkey)

ECTS (Bachelor's program) **Primary Education and Inclusive Practice**

M. Kozybaev North Kazakhstan University	University of Arizona (USA)

ECTS (Master's program) **Foreign Language: Two Foreign Languages**

Karaganda University named after Academician E.A. Buketov	Dokuz Eylul University (Turkey)

ECTS (Bachelor's program) **Special Pedagogy and Inclusive Practice**

M. Kozybaev North Kazakhstan University	University of Arizona (USA)

ECTS (Master's program) **Computer Science**

Kokshetau Abai Myrzakhmetov University	M. Akmulla Bashkir State Pedagogical University (Russia)

ECTS (Bachelor's program) **Psychology in Education**

M. Kozybaev North Kazakhstan University	University of Arizona (USA)

ECTS (Bachelor's program)
Computer Science (AI)

Kyzylorda Korkyt Ata University	Seoul National University of Science and Technology (South Korea)

ECTS (Bachelor's program)
Physics Teacher Training

South Kazakhstan Pedagogical University named after O.Zhanibekov	Gazi University (Turkey)

ECTS (Bachelor's program)
Physical Education and Sports Management

Karaganda University of Kazpotrebsoyuz	Pavlodar State Pedagogical Institute (Kazakhstan)

These examples illustrate the growing diversity and geography of partnerships in the field of pedagogical sciences, covering universities in Russia, Turkey, Kyrgyzstan, Indonesia, Korea, the USA, and Kazakhstan. The combination of new and existing programs reflects the sustainable development of international academic cooperation in teacher training, the expansion of training profiles, and the introduction of innovative approaches in the educational process.

6.3. Implementation of the International Scholarship "Bolashaq"

The deadlines for submitting documents of applicants and conducting the competitive selection for the award of the international scholarship "Bolashak" (hereinafter – the Scholarship) in 2024 were approved by Order No. 176 of the Acting Minister of Science and Higher Education of the Republic of Kazakhstan dated April 19, 2024 **"On certain measures for the implementation of the international scholarship 'Bolashak'"** (submission of documents – from April 29 to October 25, 2024, competition – from May 10 to November 30, 2024)

In total, 3,209 applications were submitted in 2024 to participate in the competitive selection for the award of the Scholarship, of which 1,901 personal files of applicants were registered, including:

- **under the categor "independently admitted"** → **1 148** per. **60,4%**
  - **master's degree** → **1 094** per.
  - **doctoral degree** → **54** per.
- **under the category with the possibility of language courses** **183** per. **9,6%**
  - **engineering and technical workers** for the master's degree" → **102** per.
  - **medical workers** for the master's degree → **61** per.
  - applicants from rural areas → **20** per.

- **for internships** → **570** per. **30%**

teachers of preschool, secondary, technical and vocational education technical and → **182** per.

medical workers → **143** per.

engineering and technical workers, workers of the agro-industrial sector → **116** per.

civil servants → **64** per.

media workers → **35** per.

workers in the field of culture, tourism and sports → **18** per.

judges and court employees → **12** per.

Based on the results of the year, by decisions of the Republican Commission for Training Personnel Abroad (hereinafter – the Republican Commission),

the Scholarship was awarded → **605** per.

doctoral degree → **27** per. **4,5%,**

master's degree → **394** per. **65,1%**

internship → **184** per. **30,4%**

in 2024, 5 meetings of the Republican Commission were held, following the results of 3 of which citizens of the RK were awarded the Scholarship.

In 2024, the number of students under academic monitoring was → **1 079** per.

doctoral degree → **145** per. **13,4%,**

master's degree → **826** per. **76,6%**

internship → **108** per. **10%**

including by field:

technical → **467** per. **43,3%**

humanities → **457** per. **42,4%**

medical → **120** per. **11,1%**

creative → **35** per. **3,2%**

Scholarship holders pursued academic studies and internships in

the USA and Canada → **562** per. **52,1%**

the UK and Ireland → **383** per. **35,5%**

European countries → **75** per. **6,9%**

Oceania → **40** per. **3,7%**

CIS → **13** per. **1,2%**

Asia → **6** per. **0,6%**

As of the end of 2024, according to monitoring, the status of scholarship holders was distributed as follows:

in academic studies → **480** per. **44,5%**

scholarship holders who completed academic studies and are awaiting a diploma	→	**226** per. **20,9%**
under control in the Republic of Kazakhstan and abroad	→	**103** per. **9,5%**
awaiting departure	→	**94** per. **8,7%**
on internship	→	**65** per. **6,0%**
assigned to language courses	→	**45** per. **4,2%**
assigned to academic studies	→	**43** per. **4,0%**,
on academic leave	→	**12** per. **1,1%**
on vacation	→	**7** per. **0,6%**
in language courses	→	**4** per. **0,4%**

As of December 31, 2024, within the framework of the Bolashak program, the following have been trained

specialists	→	**12 727** per.

under the program

master's degree	→	**7 315** per. **57,5%**,
bachelor's degree	→	**2 615** per. **20,5%**
internship	→	**2 284** per. **17,9%**
doctoral degree	→	**230** per. **1,9%**
specialist	→	**140** per. **1,1%**,
clinical residency	→	**92** per. **0,7%**
postgraduate study	→	**39** per. **0,3%**
internatura	→	**12** per. **0,1%**

of which

including in the humanities	→	**7 023** per. **55,2%**
technical fields	→	**4 582** per. **36,0%**
medical	→	**897** per. **7,0%**
creative		**225** per. **1,8%**

Graduates studied in the following countries:

the UK and Ireland	→	**5 793** per. **45,5%**
the USA and Canada	→	**3 564** per. **28%**
European countries	→	**1 490** per. **11,7%**
Asian and Oceanian countries	→	**1 005** per. **7,9%**
Russia	→	**875** per. **6,9%**

As of December 31, 2024, within the framework of the **Bolashak program**, **10,228 graduates** fulfilled their contractual obligations, ,

were under monitoring of mandatory employmen	→	**2 401** per.
had a deferral of contractual obligations in terms of employment (due to study, childcare, etc.)	→	**98** per.

Of the **2,401 graduates** under monitoring,

were employed and fulfilling their obligations →	**2 373** per. **98,83%**
were in the process of job placement →	**28** per. **1,17%**

Graduates are engaged in employment

in private companies →	**1 011** per. **42,6%**
government institutions →	**752** per. **31,7%**
the quasi-public sector →	**372** per. **15,7%**
foreign companies →	**135** per. **5,6%**
international organizations →	**40** per. **1,7%**
public associations →	**25** per. **1,1%**
national companies →	**25** per. **1,1%**
diplomatic missions →	**13** per. **0,5%**

In addition, within the framework of implementing tasks to strengthen international cooperation and expand partnerships under the Bolashak program, JSC **"Center for International Programs"** (hereinafter – the Center) carries out systematic and consistent work with leading foreign universities, research centers, and specialized international organizations.

In 2024, the Center signed a number of cooperation agreements with foreign universities (New York Film Academy (USA), University of Southern California (USA), and Washington State University (USA)) and international organizations in the field of education (Campus France (France) and Spanish Service for the Internationalization of Education (Spain)).

The concluded agreements are aimed at developing academic and scientific cooperation, implementing joint educational initiatives, exchanging experience between the parties, and also provide for the possibility of granting discounts to scholarship holders of the international **Bolashak** program for academic programs.

During the year, the Center held a number of key events aimed at the development, transformation, and promotion of the international **Bolashak** scholarship both domestically and abroad. The main focus was on issues of strategic development, digitalization, strengthening ties with scholarship holders and partner organizations, as well as expanding international cooperation.

On March 18, an online roundtable "Trends and Prospects for the Development of the Bolashak Program" was held (participants: scholarship holders from the USA; topics: Strategy 2024–2026, digitalization, academic cooperation, scientific initiatives).

On April 4 in London, a meeting took place (participants: Chairperson of the Board of JSC "Center for International Programs", scholarship holders, Embassy representatives; topics: launch of a mobile application, dissertation fund, feedback platform, and current issues of scholarship holders).

On October 12 in Manchester, a meeting was held (participants: scholarship holders, Ambassador of Kazakhstan to the UK Magzhan Ilyassov; occasion: opening of a new consulate; topics: adaptation, career growth, support for students abroad).

On October 14, the Chairperson of the Board held a meeting with scholarship holders from northern UK cities, including Manchester, Preston, and Belfast (participants: Chairperson of the Board, scholarship holders from northern UK cities; topics: scientific activities, employment; negotiations: University of Manchester – discounts and internships).

On October 15, a visit was made to the University of Warwick (participants: delegation of JSC CIP, university leadership; topics: cooperation in engineering, cybersecurity, energy; focus: support for disadvantaged categories, collaboration with Warwick Manufacturing Group).

On October 17, a visit took place to the University of Reading (participants: delegation of JSC CIP, university leadership; topics: joint research, support for students from rural areas, sustainable development).

On the same day, October 17, the Chairperson of the Board took part in the Central Asian Women's Forum Be Woman in Almaty (participants: Chairperson of the Board, 100+ speakers from 12 countries; session: "Education: IN or OUT"; topics: the role of education, the potential of women, the significance of the Bolashak program).

On October 20, the closing ceremony of the third stream of the TalpynUp mentoring program for women in business was held (participants: women in business, graduates of the Bolashak program; topics: women's leadership, education, personal and professional growth).

The events held contributed to strengthening the image of the Bolashak program on the international stage, intensifying interaction with scholarship holders and partners, introducing digital solutions, and developing new directions, in particular, the promotion of gender equality and regional inclusion.

High engagement of Bolashak scholarship holders and graduates was noted, as well as the interest of foreign universities in deepening partnership with Kazakhstan.

6.4. Intergovernmental and Interagency Grants Provided within the Framework of International Agreements and Treaties

Out of these, 1,573 personal files of applicants were registered within the framework of international agreements in the field of education for the training of Kazakhstani citizens in the following countries:

- **Hungary** → **1167** pers. **74,2%**
  - bachelor's degree → **746** pers. **63,9%**
  - master's degree → **316** pers. **27,1%**
  - doctoral studies → **18** pers. **1,5%**
  - One Tier Master → **87** pers. **7,5%**
- **China** → **328** pers. **20,9%**
  - bachelor's degree → **217** pers. **66,2%,**
  - master's degree → **106 pers. 32,3%,**
  - doctoral studies → **5 pers. 1,5%**
- **Tajikistan** → **17 pers. 1,1%**
  - bachelor's degree → **15** pers. **88,2%,**
  - master's degree → **2 pers. 11,8%**
- **Kyrgyzstan** → **3 pers. 0,2%**
  - bachelor's degree → **2 pers. 66,7%,**
  - master's degree → **1** pers. **33,3%**
- **Poland** → **46 pers. 2,9%**
  - bachelor's degree → **21** pers. **45,7%,**
  - master's degree → **16** pers. **34,8%,**
  - doctoral studies → **9 pers. 19,6%**
- **Vietnam** → **6** pers. **0,4%**
  - bachelor's degree → **6** pers.
- **Azerbaijan** → 6 pers. 0,4%
  - bachelor's degree → 1 pers. 16,7%,
  - master's degree → 5 pers. 83,3%

he number of grants allocated by country in 2024:

- **Hungary** → **250** grants
  - bachelor's degree → 110 grants 44%,
  - master's degree → 90 grants 36%
  - One Tier Master → 30 grants 12%

doctoral studies	→	20 grants 8%
China	→	**155** grants
Tajikistan	→	**100** grants
bachelor's degree	→	**80** grants **80%**
master's degree	→	**20** grants **20%**
Kyrgyzstan	→	**10** grants
bachelor's degree	→	**7** grants **70%**
master's degree	→	**3** grants **30%**
Poland	→	**11** grants
bachelor's degree	→	**3** grants **27,3%**
master's degree	→	**4** grants **36,4%**
doctoral studies	→	**4** grants **36,4%**
Vietnam	→	**3** grants
bachelor's degree	→	**3%**
Azerbaijan	→	**10** grants
bachelor's degree	→	**5** grants **50%**
master's degree	→	**5** grants **50%**

During the reporting period, under the state service **"Acceptance of documents for participation in the competition for study abroad within the framework of international agreements in the field of education"**, **958 personal** files were received under 7 (seven) intergovernmental agreements. Based on the results of the interview, **844 applicants** were recommended for study within the framework of intergovernmental agreements.

According to the decision of the receiving party, the quantitative distribution was as follows:

Hungary	→	**1141** pers. **161** grants
China	→	**326** pers. 151 grants
Poland	→	**11** pers. **8** grants
Kyrgyzstan	→	**3** pers. **3** grants
Vietnam	→	**3** pers. **3** grants

Additionally, following the interview, the following were recommended:

Azerbaijan	→	6 pers.
Tajikistan	→	9 pers.

the main list and 8 people in the reserve list. However, the Center did not receive an official response from the above-mentioned countries.

With regard to information on plans to conclude new agreements or expand existing ones within the framework of intergovernmental and interagency grants, in accordance with the Rules for Sending Citizens of the Republic of Kazakhstan for Study Abroad, approved by Order of the Minister of Education and Science of the Republic of Kazakhstan dated 19 November 2008 No. 613, the Center performs the functions of an administrator, carrying out the acceptance of documents and organization of the competitive selection of applicants, including programs

implemented under intergovernmental and interagency grants.

At the same time, it should be noted that issues related to the organization of cooperation in the field of higher and/or postgraduate education fall within the exclusive competence of the authorized body and are regulated at the intergovernmental and/or interagency level within the framework of the respective international agreements and treaties.

The Scientific Internships Program:

The deadlines for submission of documents for participation in Scientific Internships in 2024 were approved by the Order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated October 23, 2024, No. 493 "On amendments to the order of the Acting Minister of Science and Higher Education of the Republic of Kazakhstan dated April 19, 2024, No. 178 'On approval of deadlines for the submission of documents and the competition procedure for participation in the Scientific Internships program'" (submission of documents for participation in Scientific Internships – from April 29 to November 22, 2024, competition period – from May 10 to December 6, 2024).

In 2024, under the Scientific Internships program, **824 personal files** of applicants were registered in the following fields:

Social Sciences	→	**416** (**50,5**%)
Humanities and Arts	→	**88** (**10,7**%),
Engineering and Technology	→	**166** (**20,1**%),
Natural Sciences	→	**67** (**8,1**%),
Agricultural and Veterinary Sciences	→	**33** (**4**%),
Medicine and Healthcare	→	**54** (**6,6**%)

Based on the results of three meetings of the Republican Commission, Scientific Internships were awarded to **250 applicants,** distributed by fields of study as follows: :

Humanities and Arts	→	**19** pers. **7,6**%
Natural Sciences	→	**40** pers. **16**%
Engineering and Technology	→	**104** pers. **41,6**%
Medicine and Healthcare	→	**30** pers. **12**%
Agricultural and Veterinary	→	**13** pers. **5,2**%
Social Sciences	→	**44** pers. **17,6**%

(Table 6.4.1.).

In 2024, under the Scientific Internships category, a total of **781 individuals** completed internships. Graduates underwent internships in the following fields:

humanities	→	**449** pers. **57,5**%
technical	→	**289** pers. **37**%
medical	→	**27** pers. **3,5**%
creative	→	**16** pers. **2**%

Graduates completed internships in the following countries:

United States	→	244 pers.
United Kingdom	→	144 pers.
Russian Federation	→	81 pers.
Republic of Türkiye	→	90 pers.
Poland	→	42 pers.
FR of Germany	→	32 pers.
Lithuania	→	18 pers.
Italy	→	15 pers.

Israel	→	13 pers.
Switzerland	→	12 pers.
Belgium	→	11 pers.
France	→	12 pers.
Bulgaria	→	10 pers.
Belarus	→	9 pers.
Spain	→	9 pers.
Australia	→	6 pers.
Japan	→	6 pers.
Hungary	→	5 pers.
Czech Republic	→	4 pers.
Azerbaijan	→	3 pers.
Sweden	→	3 pers.
Latvia	→	2 pers.
Netherlands	→	2 pers.
Slovakia	→	2 pers.
Estonia	→	2 pers.
Malaysia	→	1 pers.
Portugal	→	1 pers.
Croatia	→	1 pers.
Republic of Korea	→	1 pers.

For reference: Graduates completed internships at leading foreign universities and organizations

- 219 universities
- 38 institutes
- 9 academies
- 22 research centers and laboratories

Table 6.4.1.
Results of the awarding of scholarships under the Scientific Internships program in 2024

Field of Study	Total Applications Submitted	Admitted to Competition	Scholarship Awarded	Not Awarded
Natural Sciences	67	67	40	27
Engineering and Technology	166	165	104	61
Medicine and Healthcare	54	54	30	24
Agricultural and Veterinary Science	33	33	13	20
Social Sciences	411	409	44	365
Humanities and Arts	86	86	19	67
Military Sciences and National Security	0	0	0	0
Total	**817**	**814**	**250**	**564**

For reference: The largest number of universities are located in

- USA — 26
- United Kingdom — 24
- Russia — 19
- Тьrkiye — 13
- Poland — 10
- Germany — 8

Issues related to the financing of scientific internships are regulated by the Order of the Acting Minister of Science and Higher Education of the Republic of Kazakhstan dated August 18, 2023, No. 422 "On the Approval of the Rules for the Selection of Applicants and the Completion of Scientific Internships." This regulatory legal act also establishes the standards of expenses for accommodation, meals, the purchase of scientific literature, the procedure for determining the type and class of transport vehicles for travel from the place of residence to the place of internship, as well as matters related to tuition fees.

6.5. **Erasmus+ in Kazakhstan:** International Partnership in Action

Erasmus+ is the flagship program of the European Union aimed at supporting initiatives in the fields of education, vocational training, youth policy, and sports, successfully implemented for more than 35 years. Since 2021, a new stage of the program has been launched, running until 2027 (Erasmus+ 2021–2027). Kazakhstan actively participates in this program cycle and demonstrates a high level of engagement.

Kazakhstani universities are successfully involved in various components of the Erasmus+ 2021–2027 program, including international credit mobility, capacity-building projects in higher education, participation in the Erasmus Mundus initiative, as well as activities under the Jean Monnet framework.

1 International Credit Mobility (ICM)

One of the most in-demand components is International Credit Mobility (ICM), within which universities of Kazakhstan implement exchange programs for students and staff in partnership with universities from the European Union and other countries associated with the program.

As of the end of 2024, 70 Kazakhstani universities are participating in ICM projects. According to the data presented in Table 6.5.1, Kazakhstan maintains a leading position among the Central Asian countries in terms of the number of implemented projects in the field of international credit mobility within the Erasmus+ 2021–2027 program cycle.

The range of EU Member States and third countries associated with the Programme with which Kazakhstani universities implement ICM projects is quite diverse. However, the largest number of joint ICM projects falls on such countries as Poland, Spain and Romania, as shown in Diagram (Diagram 6.5.1.).

The main impact of International Credit Mobility (ICM) projects on Kazakhstani universities and the country's higher education system is manifested in the following:

Development of students' and staff potential.

Participation in ICM projects provides opportunities to acquire international educational and cultural experience, broaden perspectives, and become acquainted with diverse approaches and standards of education, thereby contributing to the personal and professional development of participants.

Expansion of international cooperation.

Universities establish long-term partnerships with foreign higher education institutions, which promotes not only academic mobility but also the creation of joint educational programs, scientific initiatives, and collaborative research projects.

Table 6.5.1.
Participation of Central Asian countries in ICM projects, 2022–2024

Central Asian Country	Students and staff from CA to the EU	Students and staff from CA to the EU Students and staff from the EU to CA	Share of mobility within CA, %
Kazakhstan	1350	483	43%
Kyrgyzstan	532	213	17%
Tajikistan	164	121	6%
Turkmenistan	14	8	2%
Uzbekistan	990	421	32%

Improvement of education quality.

Engagement in international academic processes enables students and faculty to access advanced teaching methodologies and research practices, facilitating the introduction of innovative approaches and enhancing the overall quality of educational services.

Strengthening the international image of universities.

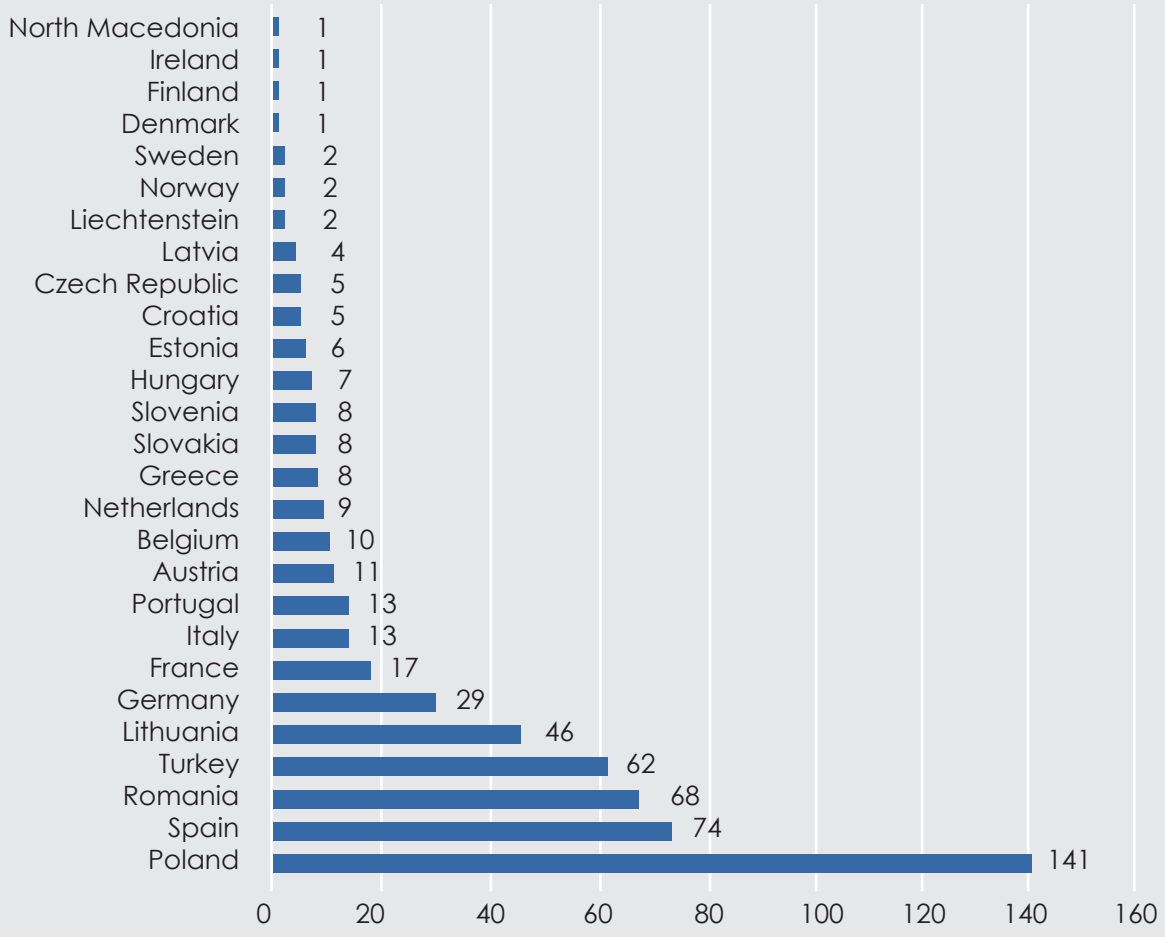
Participation in ICM contributes to enhancing the international visibility and prestige of universities, attracting foreign students and faculty, and reinforcing trust among international academic partners.

Stimulation of educational and scientific innovation

Cooperation with European universities within ICM serves as a source of new ideas, supports the development of joint scientific publications, and fosters the implementation of Capacity Building in Higher Education (CBHE) projects, thereby contributing to the renewal of the educational and research environment.

Diagram 6.5.1.

Number of ICM projects implemented by Kazakhstani universities with EU Member States and third countries associated with the Programme (2022–2024)



2 Capacity Building in Higher Education (CBHE)

Within the framework of CBHE projects, Kazakhstani universities establish or join consortia with universities in Europe and other regions to implement joint initiatives aimed at developing and modernizing educational programs, teaching methods, improving university governance and management, and strengthening linkages between higher education institutions and industry. In 2024, the implementation of 13 CBHE projects with the participation of Kazakhstani universities was completed (Table 6.5.2).

Table 6.5.2.
Facts and Figures on CBHE Projects Completed in 2024

13	projects	**31**	universities	**9**	non-academic partners
12	joint projects	**1**	structural project	**2**	projects coordinated by Kazakhstani universities
3	national projects	**3**	regional projects	**7**	interregional projects

By focus, these 13 CBHE projects can be divided into **three categories**

A. Projects aimed at developing new educational programs/ modules or modernizing existing programs.

Project **A.1.**

MIETIC: Development of a Master's Program in Industrial Enterprise Management for Transition Economies

Results

1. A Master's program **"Technological Entrepreneurship"** was developed and launched, tailored to the needs of the industrial sector.
2. The program successfully passed **NAAR** accreditation and received a 5-year certificate.
3. Master's students undertook academic mobility at Karaganda University of Kazpotrebsoyuz.
4. The program is supported by industrial enterprises, including JSC **KazZinc** and NCE **Atameken.**
5. The **"Hangar"** platform – an open space for the development of startups and student entrepreneurship – was launched.

Project A.2.

ACeSYRI:
Advanced Center for PhD Students and Young Researchers in Informatics

Results

1. Six ACeSYRI centers and the ACeSYRI portal were established in Kazakhstani universities.
2. Numerous international scientific events (seminars, PhD forums, open lectures) were organized with active participation of doctoral students and young scholars.
3. Young researchers prepared over 120 scientific works, more than 45 of which were published jointly with EU representatives.
4. A total of 126 mobilities were carried out for participation in various meetings, seminars, and conferences.

Project A.3.

IMPROvE:
Internationalization of Master's Programs in Agriculture through English-Taught Courses

Results

1. 18 new modules aligned with EU quality standards were developed and implemented, enhancing competitiveness of educational programs and graduate training.
2. Faculty retraining enabled universities to successfully adopt English-taught and blended learning formats.
3. Student and staff exchange programs were strengthened, contributing to the integration of educational programs.
4. Conditions were created for the implementation of joint Master's programs, expanding opportunities for international degrees and improving graduates' competitiveness in the global labor market.

Project A.4.

UnWaste:
Development of Circular Economy in Partner Countries through the Implementation of a Master's Program in Waste Management

Results

1. A Master's program "Sustainable Natural Resource Management" was developed, included in the Register of Higher and Postgraduate Educational Programs, and accredited by NAAR.
2. Master's students and faculty undertook scientific internships at European universities.
3. Equipment with software was procured.
4. An educational and training center "Waste Management" was established to develop skills in waste handling.

Project A.5.

GEOCLIC:
New Courses in Geospatial Engineering for Adapting Coastal Ecosystems to Climate Change

Results

1. BA/MSc/PhD subjects in the target area were updated and implemented in partner universities' curricula.
2. Capacity-building master classes and trainings for faculty were conducted.
3. GEOCLIC laboratories (GEOLAB), GEOCLIC offices (GEOCOF), and virtual event classrooms (CVE) were established and equipped in each partner university.

B. Projects Aimed at Improving Medical Education

Project B.1.

HARMONEE:
Harmonization and Mutual Recognition of Master's Programs in Occupational and Environmental Health

Results

1. Developed 9 modules worth 5 ECTS each.
2. Course materials were integrated into the Master's programs in Medical and Preventive Care and Public Health.
3. Joint scientific research projects involving students of partner universities were included in the project-based learning component. Under the leadership of Professor Toguzbaeva K.K. and invited Professor F. Rahim, joint research projects were carried out with faculty and students.

Project B.2.

BACE:
Building Academic Capacity in Global Health in Eastern Europe and Central Asia

Results

1. Developed 6 courses (Globalization and Health; Socio-economic Determinants of Health; Measuring Population Health; Non-communicable Diseases; Infectious Disease Outbreaks and Antimicrobial Resistance; Impact of Environmental Pollution and Climate Change on Population Health).
2. Approval of the joint Master's program Global Health at NAO "Astana Medical University", developed in collaboration with colleagues from the Higher School of Medicine, Faculty of Medicine and Health, Al-Farabi Kazakh National University.
3. Abstract published and application accepted for participation in the GLOBEHEAL 2022 Conference.

Project A.3.

FOR21:
Advancing the Physician of the 21st Century: Education for Patient-Centered Communication

Results

1. Development of a medical education program with educational strategies, methods, and tools aimed at building communication competence and social responsibility, improving doctor–patient communication.
2. Introduction of a new system for teaching communication skills in medical universities, addressing necessary changes in teaching approaches and learning habits.
3. Establishment of Communication Skills Development Centers to train faculty in using innovative teaching approaches and to support the newly created program Patient-Centered Communication Skills.
4. Transition from lecture-based teaching to active learning methods, such as flipped classrooms, standardized and virtual patients, and ICT-based methods within a fully integrated educational process.

C. Projects Aimed at Strengthening Engagement with the Labor Market and Improving Graduate Employability

Project C.1.

DIARKAZ:
Dual Education for Industrial Automation and Robotics in Kazakhstan

Results

1. Training specialists in industrial automation and robotics.
2. Promoting transnational cooperation between universities and business.
3. Developing a modern educational program in industrial automation and robotics.
4. Implementing innovative teaching methodology through dual education.
5. Fostering internationalization via cooperation with European universities.

Project C.2.

REILEAP:
Modernizing the Leather Industry in Uzbekistan and Kazakhstan

Results

1. Developed teaching materials for updated curricula in the leather and footwear sector.
2. Installed equipment for professional training centers in Uzbekistan and Kazakhstan based on EU expertise.
3. Ensured sustainability of project outcomes by creating a platform for collaboration between training centers and business.
4. Strengthened ties with local enterprises and the leather sector as a whole.

Project C.3.

PICASP:
Pilot Courses in Enterprises to Foster University–Enterprise Cooperation for the Development of the Caspian Region

Results

1. Strengthened cooperation with enterprises to implement innovative teaching methods and enhance student competitiveness.
2. Developed new courses and updated Master's program in entrepreneurship and SME management.
3. Trained and retrained 15 faculty members, 30 tutors, 15 mentors, and 5 technical specialists in practical entrepreneurship.
4. Expanded online learning opportunities via MOOCs.
5. Improved educational infrastructure, including creation of a Practical Entrepreneurship Lab.
6. Developed a quality assurance and accreditation guide for entrepreneurship programs.

Project C.4.

TRIGGER:
Fostering Innovative Approaches and Entrepreneurial Skills for Graduate Employability in CA

Results

1. Strengthened institutional capacity of universities to meet new challenges and threats.
2. Improved graduate competitiveness on the labor market through entrepreneurship skills, with highly qualified workforce adapted to labor market needs.
3. Implemented an effective entrepreneurship training program at the university level.
4. Developed a career, employability, and corporate services guide.
5. Established new centers/services for employability, career development, and corporate engagement at partner universities.
6. Designed a Roadmap for Enhancing Graduate Employability for participating universities.

Project C.5.

KAZDUAL:
Implementing the Dual System in Kazakhstan (Structural Project)

Results

1. Aligned professional education programs of colleges and universities.
2. Developed a flexible dual education model for higher and TVET institutions.
3. Piloted and tested the proposed dual education model.
4. With support of the Ministry of Science and Higher Education of Kazakhstan, amendments were introduced to national regulations in science, higher, and vocational education.
5. Established laboratories and the OBSERVATORY KAZDUAL dual and professional education platform at partner universities, where dual education experts conduct training for universities, colleges, and employer-tutors.

In terms of impact, these projects have contributed to the introduction of a number of significant qualitative changes in the higher education system of Kazakhstan. In particular:

Modernization of educational programs. Thanks to Erasmus+ CBHE projects, the educational programs of Kazakhstani universities were updated in line with new educational standards and the challenges of the modern world, which improved the overall quality of education.

Capacity building of students and university staff. Participation in international projects provided students and academic staff of Kazakhstani universities with opportunities to improve their knowledge and skills, as well as to exchange experience with colleagues from other countries.

Laboratory equipment. Within the framework of CBHE projects, laboratories at universities were equipped and software was purchased to achieve project goals.

Formation of sustainable partnerships and development of international cooperation. CBHE projects supported the development of partnerships between universities, research institutions, and educational organizations from different countries, facilitating the exchange of experience and best practices. In many cases, project teams that established sustainable partnerships during the implementation of CBHE projects continue to apply for new initiatives, thereby expanding international cooperation.

Strengthening the link between universities and the labor market, improving graduates' employability. The implementation of CBHE projects significantly increased the involvement of labor market representatives in the educational process, ensuring that academic programs meet labor market requirements and improving graduates' employability prospects.

Reforming the higher education system and long-term changes. Structural CBHE projects led to the reform of the higher education system and the development of long-term strategies and programs that continue to evolve and bring changes to the system even after the completion of projects.

Another 12 CBHE projects are currently being implemented with the participation of 24 Kazakhstani universities (Table 6.5.3.)

Table 6.5.3.
Facts and Figures on Ongoing CBHE Projects

12	projects	**24**	universities	**9**	non-academic partners
11	joint projects	**1**	structural project	**1**	project coordinated by Kazakhstani university
2	national projects	**7**	regional projects	**3**	interregional projects

Project 1.

BERNICA:
Development of Educational and Research Capacities in Nutrition and Dietetics in CA

Expected Project Results

1. Development and implementation of innovative curricula in nutrition and dietetics in line with the Bologna Process and ENQA standards through a series of trainings.
2. Creation of future-oriented courses/modules with innovative teaching scenarios for bachelor's and master's students, practicing doctors, and nurses.
3. Enhancement of research and innovation capacities of target universities in this field.

Project 2.

AGROKAZ:
Development of a Bachelor Program in Agroecology with Elements of Dual Education in Kazakhstan

Expected Project Results

1. Development and implementation of a sustainable bachelor program in agroecology with elements of dual education in Kazakhstani universities, along with courses for professionals aimed at lifelong learning.
2. Reduction of gaps in workforce structure, volume, and quality to meet actual farm/enterprise needs, preparing specialists with competencies in modern technologies.
3. Revision of agroecology curriculum in Kazakhstan through creation of a sustainable, internationally-informed dual education program.

Project 3.

EMINReM:
Master's Program on Eco-Extraction and Innovative Resource Management

Expected Project Results

1. Development of a master's program based on EU experience, integrating best EU practices in eco-extraction and innovative resource management into universities.
2. Creation of educational materials and EMINReM laboratories for students in 7 universities.
3. Launch of a joint virtual e-learning platform, plus pilot and advanced courses for students and experts.

Project 4.

HWCA:
Strengthening Higher Education in the Water Sector for Climate Resilience and Security in CA

Expected Project Results

1. Training of university lecturers in CA on new curricula.
2. Development of new programs tailored to regional conditions for training specialists to address water sector challenges.
3. Enhancement of student mobility and development of regional continuous learning and research support programs.

Project 5.

CirculEC:
Development of Innovative Curricula and Modules on Circular Economy and Sustainable Development

Expected Project Results

1. Updating existing circular economy courses in universities, adapted to the needs of each country.
2. Implementation of EU best practices in circular economy (interdisciplinary area combining economics, ecology, recycling industry, IT, and education).

Project 6.

LESLIE:
Land Management, Environment, and Solid Waste Governance: Education and Business in CA

Expected Project Results

1. Creation of the Center for Sustainable Land Management (CSLM) in Kazakhstan and Uzbekistan with university integration.
2. Joint development and implementation of a set of micro-credentials on CSLM.
3. Development of digital didactic materials for integration into online bachelor's and master's programs.
4. Integration of all educational materials into a unified online CSLM repository.

Project 7.

TEX4FUTURE:
Textile Production for the Future in Uzbekistan and Kazakhstan

Expected Project Results

1. Creation of 4 textile centers in Uzbekistan and Kazakhstan focusing on modern industry developments.
2. Development, testing, and adaptation of innovative educational programs covering industry trends.
3. Professional development of textile industry staff.
4. Implementation of practical student training programs (e.g., real business/industry case studies).
5. Engagement of enterprises in training and research.

Project 8.

ESGCA:
Bridging Environmental Issues, Societal Needs, and Good Governance in Education and Employment in CA

Expected Project Results

1. Creation of a sustainable platform connecting educational institutions, government, and enterprises for effective management of environmental and social aspects, green jobs, and skilled workforce preparation.
2. Establishment of an international network among partners to promote research, innovation, and new policy development.

Project 9.

GDCAU:
Green Deal for Universities in CA

Expected Project Results

1. Strengthening university capacities to develop and implement strategies aligned with the Green Deal agenda.
2. Training specialists with skills and understanding in environmental sustainability.
3. Enhancing collaboration between universities and businesses to support Green Deal implementation.

Project 10.

OPTIFY:
Enhancing University Capacity in Optical Networks in Georgia, Azerbaijan, and Kazakhstan

Expected Project Results

1. Capacity building for lecturers to implement new educational programs and support innovative program goals.
2. Introduction of problem-based learning approaches enabling students to develop projects addressing real industry challenges.
3. Development of modules for professional development and retraining to maintain industry competencies.

Project 11.

GreenTech Horizons:
Fostering Green and Digital Transitions in Eastern Europe, Central Asia, and Asia

Expected Project Results

1. Development, creation, and piloting of an innovative competency-based learning ecosystem to equip future generations with skills to tackle dual green and digital transition challenges and maximize positive societal impact.

Project 12.

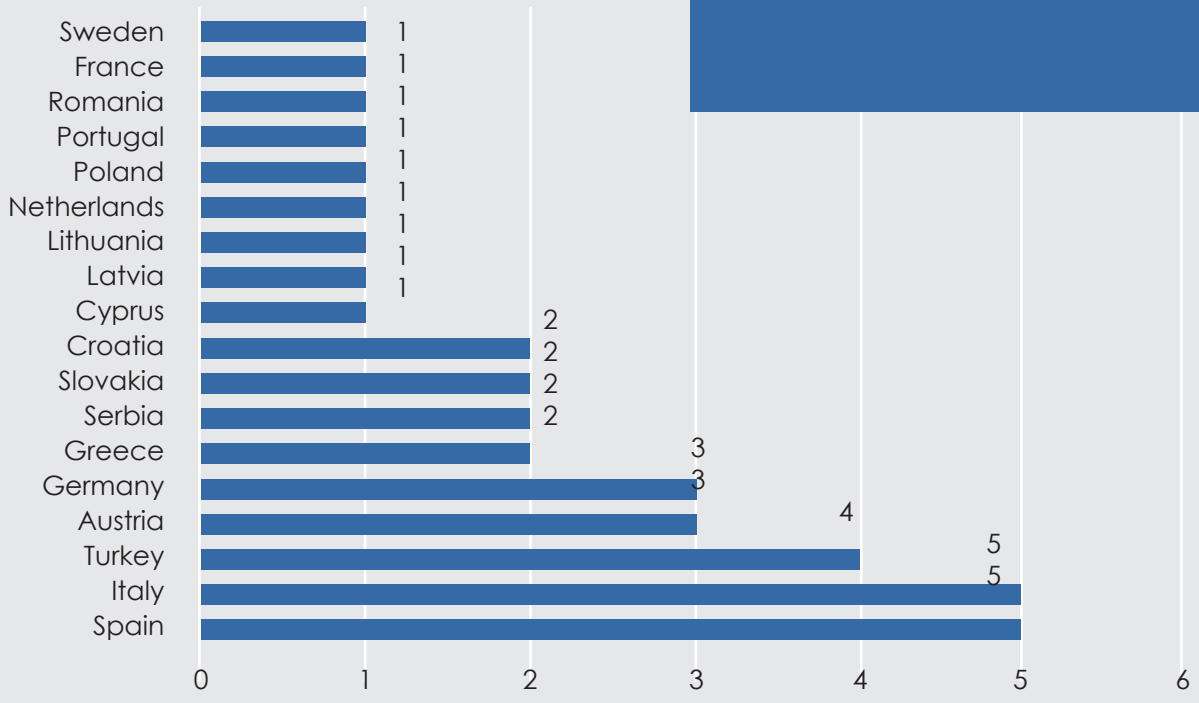
EDUFUSION NSG:
Edu-Fusion Network for Sustainable Growth (Structural Project)

Expected Project Results

1. Integration of program accreditation and faculty with a comprehensive educational platform.
2. Delivery of accredited online courses in STEAM and entrepreneurship with a focus on gender inclusivity and climate neutrality.
3. Creation of accredited innovation centers and incubators supporting youth and women entrepreneurship.
4. Formation of a portal facilitating collaboration between academia and business for joint projects and internships.
5. Strengthening the connection between universities and employers by integrating academia with the labor market.

Within these projects, Kazakhstani universities collaborate with various EU member states and third countries associated with the Program. However, the largest number of HEI capacity-building (CBHE) projects are implemented in partnership with universities from **Spain**, **Italy**, and **Turkey** (Diagram 6.5.2).

Diagram 6.5.2.
Number of Capacity-Building Projects in Higher Education (CBHE) **involving Kazakhstani universities and universities from EU member states and third countries associated with the Program** (2022–2024)



3 Erasmus Mundus

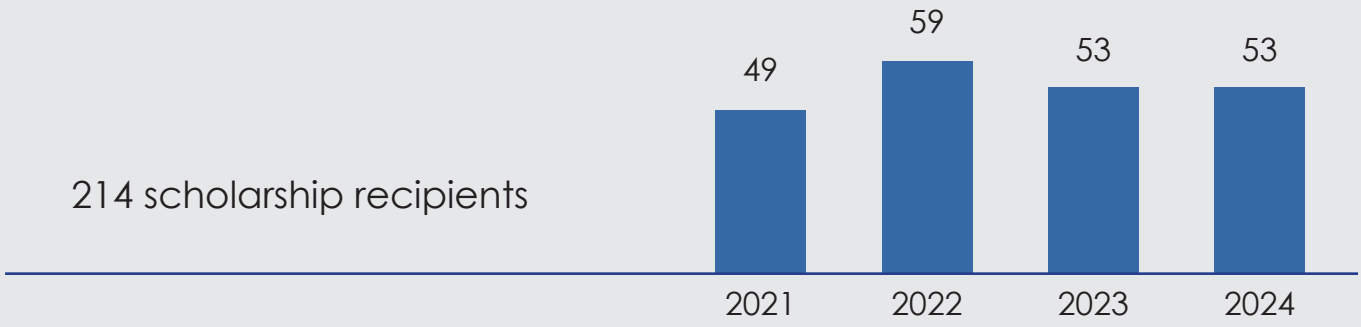
The Erasmus Mundus action includes Erasmus Mundus Joint Masters (EMJM) and Erasmus Mundus Design Measure (EMDM). EMJM involves the implementation of joint master's programs, whereas EMDM focuses on the development of a new international master's program in collaboration with a consortium. As of the end of 2024, the only full partner from Kazakhstan for EMJM and EMDM projects remains KIMEP University. The university is a full partner of the CEERES master's program "International Relations in Central and Eastern European, Russian, and Eurasian Studies," and, based on the 2024 competitive selection results, it won Kazakhstan's first-ever EMDM project, GreenMAS. The goal of the project is to develop a joint master's program in green economy management for arid and semi-arid climatic zones.

It should also be noted that EMJM provides an excellent opportunity for any individual with higher education to enroll in a fully-funded master's program.

In terms of the number of scholarship recipients, Kazakhstan leads among Central Asian countries.

Diagram 6.5.3.

Participation of Kazakhstani citizens in the EMJM Master's Program competition



As shown in Diagram 3, on average, 53 applicants from Kazakhstan become EMJM master's program scholarship holders annually. (Diagram 6.5.3.).

The main impact of Erasmus Mundus projects on Kazakhstani universities and the country's higher education system includes:

- **Enhancement of educational program quality**, as Kazakhstani universities develop and implement joint master's programs with universities in Europe and other regions, adhering to common requirements and standards.
- **Attraction of talented international students and increased global appeal of Kazakhstani universities:** since Erasmus Mundus is a scholarship-based program, students are selected competitively. Participation in Erasmus Mundus projects enhances the overall attractiveness of universities, as the program targets top students from around the world.
- **Strengthening international partnerships:** cooperation between Kazakhstani universities and institutions worldwide under Erasmus Mundus goes beyond academic programs and can include joint research, participation in scientific projects, faculty and student exchanges, and may facilitate sharing of infrastructure and scientific resources.

4 Жан Моне

- Jean Monnet projects support the development of teaching and research in EU studies worldwide, and Kazakhstan is an active participant in this Erasmus+ action. As of the end of 2024, 13 Jean Monnet projects are being implemented with the participation of 8 Kazakhstani universities (Table 6.5.4).

Table 6.5.4.
Facts and Figures on Current Jean Monnet Projects Involving Kazakhstani Universities

8	universities of Kazakhstan	**13**	Jean Monnet projects	**8**	Jean Monnet modules
2	Jean Monnet Centres of Excellence	**1**	Jean Monnet Chair	**2**	Jean Monnet networks

Among the key outcomes of the Jean Monnet projects, the following can be highlighted:

Modernization of educational programs: Universities in Kazakhstan updated their curricula by incorporating specific courses on the EU experience, focusing on in-depth study of its history, institutional structures, politics, economy, and law. This helps students understand the EU not only as a political entity but also its influence on global processes.

Integration of interdisciplinary knowledge: Knowledge from areas such as law, economics, international relations, and political science is integrated within EU studies. This provides students with interdisciplinary skills and approaches, making them more versatile and competitive in the labor market.

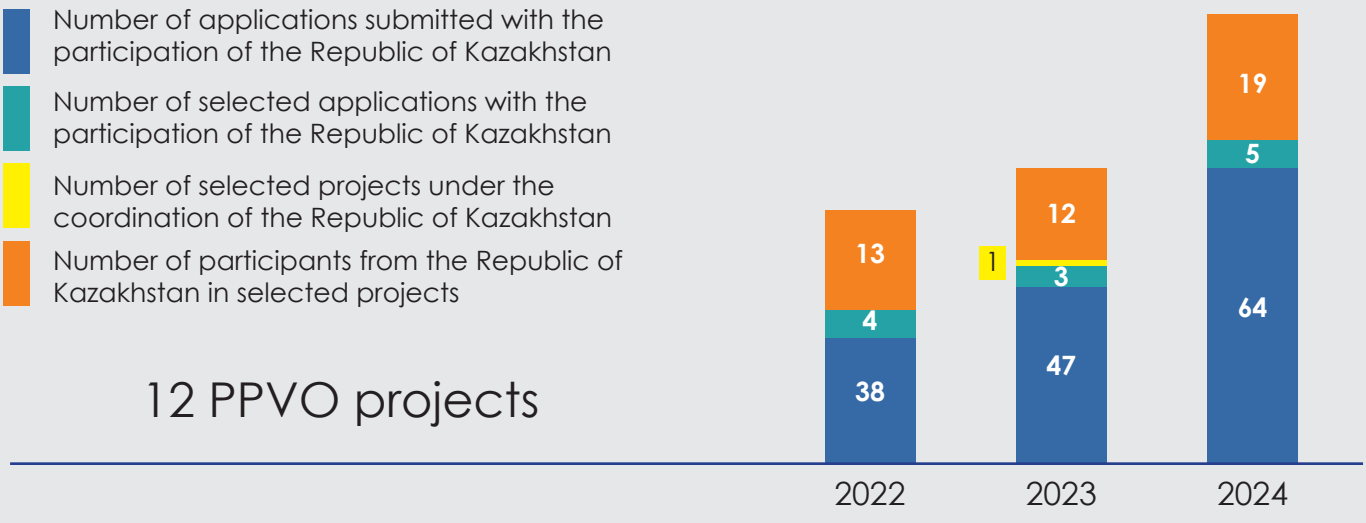
Strengthening international dialogue: Within the Jean Monnet projects, universities actively organize conferences, seminars, and other events that promote dialogue between cultures and peoples.

KEY ACHIEVEMENTS OF KAZAKHSTANI UNIVERSITIES IN THE ERASMUS+ PROGRAM IN 2024

1 Increase in the Activity Level of Kazakhstani Universities in CBHE Projects

In the Erasmus+ 2021–2027 program, 2024 was a record year for Kazakhstan in terms of the number of CBHE project applications submitted, the number of selected applications, and the number of participants. As shown in Diagram 4, the activity level of Kazakhstani universities in CBHE projects increased by **36%** compared to 2023. (Diagram 6.5.4.)

Diagram 6.5.4.
Participation of Kazakhstani Universities in HE Capacity-Building (CBHE) Projects



2 Record Number of New Participants in HE Capacity-Building Projects (CBHE) in 2024

Each year, the list of participants in CBHE projects is supplemented by universities that have not previously participated in such projects. While in 2023 Alikhan Bokeikhan University and the International Kazakh-Turkish University named after Yasawi joined CBHE projects for the first time, in 2024 three more universities became first-time participants: Eurasian Technological University, Karaganda Industrial University, and the International University of Engineering and Technology.

3 Increase in Activity of Kazakhstani Universities in Jean Monnet Projects

In 2024, Kazakhstani universities also demonstrated a record level of applications for Jean Monnet projects. As shown in Diagram 5, the activity of universities in this program increased by 52% compared to 2023. (Diagram 6.5.5.)

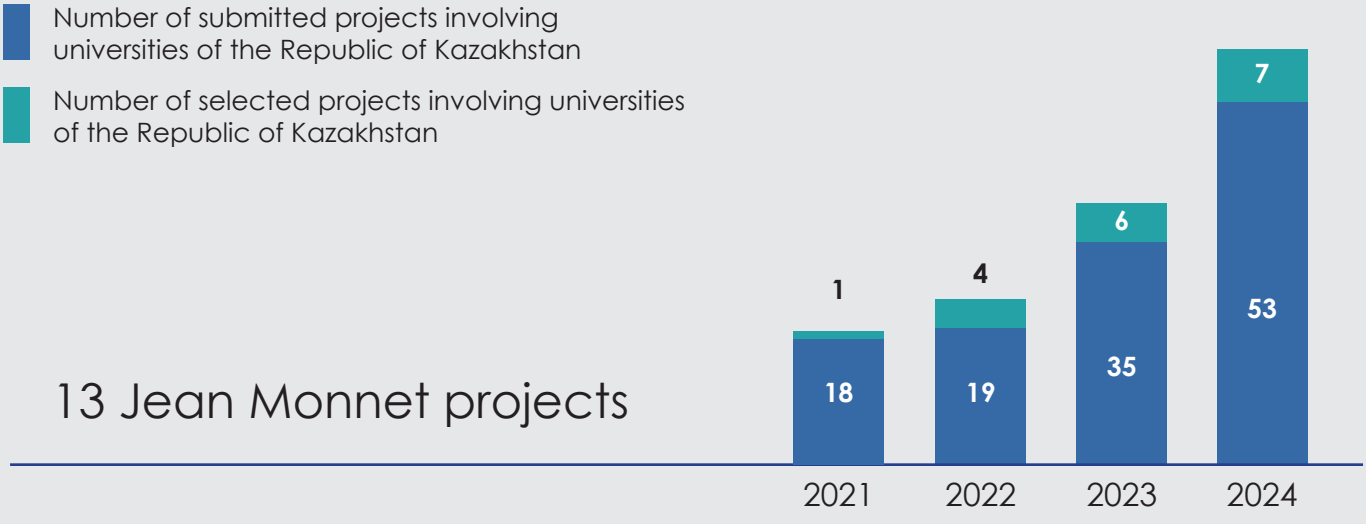
4 Participation of Kazakhstani Universities in Jean Monnet Projects

As a result of the 2024 competitive selection, **KIMEP University** became the winner of an **Erasmus Mundus Design Measure (EMDM) project**, aimed at developing a joint master's program.

Notably, this project is the **first EMDM project in the history of Kazakhstan and Central Asia t**o be implemented under the coordination of a Kazakhstani university.

The project, named **GreenMAS**, focuses on creating a master's program in **green economy management** tailored for arid and semi-arid climate zones.

Diagram 6.5.5.
Participation of Kazakhstani Universities in Jean Monnet Projects



RECOMMENDATIONS

First, based on the data presented, there is a noticeable increase in the activity of Kazakhstani universities within the Erasmus+ program in 2024. Higher education institutions in Kazakhstan showed high engagement, submitting applications across all program strands and, for the first time, becoming recipients of an Erasmus Mundus Design Measure project. At the same time, there remains a need to improve the quality of project proposals, particularly in capacity-building projects in higher education (CBHE), with an emphasis on initiatives coordinated by Kazakhstani universities. It is recommended to organize training activities aimed at developing skills for preparing competitive project proposals.

Second, considering that Erasmus+ projects address similar objectives in higher education, it is important to strengthen synergy between projects implemented in Kazakhstan. Such coordination significantly amplifies the impact of the programs, expands the reach of target groups, and ensures more sustainable influence on the educational system as a whole. Synergy facilitates the exchange of best practices, innovative approaches, and adaptation and scaling of successful solutions. It allows avoiding repeated mistakes, leveraging accumulated experience, and achieving more effective results. Coordinated efforts of different projects can also act as a catalyst for systemic changes in education, accelerating the implementation of standards, innovations, and reforms. To achieve these goals, it is recommended to regularly organize **cluster meetings** with project teams working on related topics, as well as representatives of relevant governmental and national structures.

Third, although Erasmus+ projects intersect the fields of education and research, most national competitions and rankings still strictly separate these areas. As a result, the implementation of such projects by universities often does not receive due recognition or is only partially reflected. It is therefore proposed to **classify Erasmus+ as scientific-educational projects** and include them in the list of evaluated indicators in national competitions and rankings, considering all key parameters, including funding volume and contractual obligations.

Fourth, the Erasmus+ budget for Central Asian countries for 2021–2027 was halved. At the same time, both the European Union and Central Asian countries continue to seek deeper partnership. In this regard, it is advisable for the Erasmus+ National Offices in the region, together with relevant ministries, to initiate discussions on increasing the program budget for Central Asia in the next programming cycle starting in 2028.

CONCLUSIONS TO CHAPTER 6

In 2024, the outgoing academic mobility of Kazakhstani students consistently exceeded incoming mobility. A total of **4,416 students** went abroad, while **1,207 foreign students** arrived in Kazakhstan. The main partner countries for incoming mobility were Kyrgyzstan, China, and France, while outgoing mobility focused on Turkey, Poland, and Germany. Among foreign students, business, management, and law were the most popular fields, whereas Kazakhstani students preferred education, healthcare, and engineering. Key challenges in mobility included visa procedures, misalignment of academic calendars, and language barriers.

Faculty academic mobility in 2024 involved **769 teachers from 73 universities**, a 25% increase compared to 2023. Leading partner countries were Uzbekistan, Kyrgyzstan, and Russia, with Turkey and Poland being the most active European partners. The majority of participants held PhD degrees, with the largest group in pedagogical sciences. Exchanges were mainly conducted offline, though there was growing interest in blended learning formats.

In 2024, the **Registry of Higher and Postgraduate Educational Programs** included **361 joint and double-degree programs**, mostly implemented by national and large regional universities. Partner institutions spanned Russia, Turkey, Kyrgyzstan, the USA, China, Indonesia, and Korea. Despite the activity of leading universities, increased participation of regional universities is needed to ensure a more equitable distribution of academic opportunities.

Under the **Bolashak International Scholarship** in 2024, **3,209 applications** were submitted, and **605 scholarships** were awarded to Kazakhstani citizens, of which 65.1% pursued master's programs and 30.4% internships. Most scholars chose to study in the USA, Canada, the UK, and EU countries. Since the program's inception, over **12,700 specialists** have been trained, with **98.8% employed** and fulfilling their obligations. Special attention in 2024 was given to developing partnerships with foreign universities, digitizing processes, and promoting gender and regional inclusion.

In intergovernmental and interagency grants, leading directions were **Hungary (74% of applications)** and **China (21%)**. Hungary provided 250 grants, China 155, with additional grants for Poland, Tajikistan, Vietnam, and Azerbaijan. Support covered bachelor's, master's, doctoral programs, and joint master's trajectories.

Overall, in 2024, Kazakhstan strengthened its position in international academic cooperation, expanded the geography of partners, and diversified exchange formats. However, there remains a significant imbalance between outgoing and incoming mobility, as well as high concentration of educational programs and opportunities in leading universities. To further development, it is necessary to simplify visa procedures, enhance students' language preparation, and actively involve regional universities in international projects.

Chapter 7.

University Science and Innovation: From Research to the Knowledge Economy

7.1. Grants, Startups, and Technology Parks: Advancing Research and Technology Transfer in Universities

In 2024, Kazakhstani science showed steady progress, both in quantitative and institutional terms. According to the Bureau of National Statistics, the number of organizations engaged in scientific research increased to **425**, which is **11** more than in 2022.

The research sector in Kazakhstan employs **25,473 specialists** (an 18% increase compared to the baseline year 2021, against the initially planned 3%; the number of researchers has grown by 26% compared to 2021).

Special attention is being given to creating conditions for the training of scientific personnel (PhD graduates). The state order for doctoral programs has been increased to 1,919 places.

The Law on Science and Technological Policy was adopted to promote the development of science, implement technological policy, and introduce the results of scientific achievements to enhance the country's competitiveness, as well as to address strategic, professional, and social issues of scientific activity [43].

In addition, the Law on Public Procurement was signed, which includes provisions regulating the purchase of goods, works, and services by research institutes and universities necessary for conducting scientific research and activities, exempting them from the general bureaucratic procedures of public procurement [44]. The procurement procedure will be determined by the Ministry of Science and Higher Education in coordination with the authorized public procurement body.

As part of the consistent efforts to raise the prestige of scientific activity and strengthen social support for researchers in Kazakhstan, significant measures to improve financial incentives for scientific staff were introduced in 2024. Salaries of employees of research organizations were increased by 18% in 2024, with a further 17% increase planned from January 2025.

Furthermore, under the provisions of the Law on Amendments and Additions to Certain Legislative Acts of the Republic of Kazakhstan on Science, **the amount of bonuses for academic titles has been raised:** up to 25 times the monthly calculation index (MCI) for associate professors holding the degree of Candidate

of Sciences, PhD, or Doctor of Profile (previously 17 MCI); up to 42 MCI for holders of the Doctor of Sciences degree (previously 34 MCI); and up to 50 MCI for professors of all ranks (previously 17 MCI) [45].

The institutional development of science is reinforced by strengthening the status of the National Academy of Sciences, which since 2023 has been operating under the President of the Republic of Kazakhstan. To develop strategic decisions in science, the National Council for Science and Technology has been established under the President of Kazakhstan [46]. Currently, 250 organizations are engaged in scientific activities, with access to leading international databases, including Web of Science, Scopus, and Wiley.

Since 2022, Kazakhstan has witnessed an expansion of its network of research universities, reflecting the commitment to enhancing the scientific component within the higher education system. These include L.N. Gumilyov Eurasian National University, Al-Farabi Kazakh National University, K. Satpayev Kazakh National Research Technical University, M. Auezov South Kazakhstan University, and E.A. Buketov Karaganda University. A development program for Satpayev Kazakh National Technical University for 2023–2027 has been designed, which envisions the creation of a research hub for new technologies in

engineering education and science on its basis[47].

In 2024, a total of 2,297 research projects, 162 scientific and technical programs, and 134 commercialization projects are being implemented. Young scientists are conducting more than 1,000 independent studies. For instance, researchers at K. Satpayev Kazakh National Technical University have developed a method for producing the chemical element selenium with 99.5% purity, which is in high demand in medicine, electronics, and the glass industry.

For 2024–2026, the state budget for science in Kazakhstan amounts to 703.6 billion tenge, which is 9% higher compared to the previous three-year period. In 2024 alone, 194.4 billion tenge has been allocated from the republican budget, including 72.3 billion for program-targeted funding, 76.5 billion for grant funding, 23.3 billion for commercialization, 9.9 billion for baseline funding, and 3.1 billion for fundamental research. This has allowed the share of domestic R&D expenditures in GDP to

increase from 121 billion to 173 billion tenge (from 0.13% to 0.14%).

At the same time, unfortunately, public funds still account for the lion's share of research expenditures – about 70% – whereas international practice demonstrates the opposite ratio. In leading

countries, the private sector plays the primary role in financing science: 85.6% in Israel, 78.8% in Japan, 77.7% in the Republic of Korea, and 71.2% in the United States.

To enhance the efficiency of science funding, the Ministry of Science and Higher Education of Kazakhstan has initiated several measures. First, the draft of the new Tax Code provides for tax deductions of up to 150% of business expenditures on research, aimed at stimulating private investment. Second, emphasis is placed on implementing the rule requiring subsoil users to allocate 1% of their expenditures to R&D, as stipulated by the Subsoil Code. However, this will require the introduction of a clear mechanism for control and enforcement. To reach a comparable level, Kazakhstan must strengthen private sector engagement and develop sustainable partnerships between research organizations and industrial sectors.

In an effort to enhance the prestige of scientific work and provide support for young researchers, Kazakhstan is implementing initiatives aimed at improving their social well-being and professional development. On October 19, 2023, the Ministry of Science and Higher Education of the Republic of Kazakhstan and Otbasy Bank JSC signed an agreement to launch a preferential housing loan program for 2023–2027. The program was officially launched on December 1, 2023, enabling young

scientists to access housing loans of up to 20 million tenge. Within the first eight months of 2024, 290 apartments were allocated, while the total number of participants during this period will not exceed 1,000.

At the same time, international scientific mobility is being strengthened: in 2023, 809 researchers received grants for internships at leading global research centers. Under the Bolashak program, the total number of graduates has reached 12,665, of whom 1,942 fall under the category of 'scientific and pedagogical workers.'

Despite these positive results, the number of trained scientific personnel remains limited. For example, in 2023 only 55 individuals completed training, while in 2024 this figure dropped to just 15 (compared to 19 in 2009, 55 in 2010, 115 in 2011, 124 in 2012, 428 in 2013, 384 in 2014, 185 in 2015, 140 in 2016, 98 in 2017, 76 in 2018, 72 in 2019, 46 in 2020, 44 in 2021, and 86 in 2022). These figures highlight the need to further strengthen support measures and expand career development opportunities for young people in the scientific field.

Startup Ecosystem

In 2024, Kazakhstan's startup ecosystem is showing steady growth and is gaining strategic importance in the context of the country's digital transformation. In the first six months alone, 357 new startups were registered–28% more than during the same

period last year. This growth is supported by significant government initiatives: within the framework of the "Digital Kazakhstan" program, 120 billion tenge (approximately USD 280 million) has been allocated, enabling the creation of eight accelerators and three venture capital funds.

Almaty continues to serve as the country's largest hub for technological entrepreneurship, concentrating more than 60% of all startups and hosting major fintech and e-commerce projects such as Kaspi.kz, Chocofamily, and Kolesa.kz.

Investment volumes in Kazakhstani startups reached USD 35 million in the first quarter of 2024, continuing the upward trend compared to USD 78 million for the entirety of 2023. Growing interest from international companies is further evidenced by the launch of Google's innovation hub in Almaty, focused on the development of artificial intelligence–based products.

Universities are becoming an increasingly important part of the ecosystem: Nazarbayev University, Al-Farabi Kazakh National University, and Satbayev Kazakh National Research Technical University actively support startups through acceleration programs, mentoring, and infrastructure for students and graduates aspiring to bring entrepreneurial ideas to market.

Taken together, these developments signal the emergence of a competitive technological ecosystem in Kazakhstan with strong export capacity and investment potential.

Technoparks

As part of the implementation of the Head of State's directives under Point 68 of the Action Plan for the realization of the Presidential election program "A Just Kazakhstan – For Everyone and Forever" [], and Point 2.1.3 of the minutes of the National Council for Science and Technology meeting of June 1, 2022 (No. 22-01-13.4), the Ministry has planned the implementation of **17 scientific and technical programs for 2023–2026**. These initiatives are aimed at establishing technoparks and engineering centers at national and regional universities in partnership with major enterprises and international partners, covering all regions of the country (taking into account their specialization) and addressing all priority areas of science.

In 2023, four programs were launched for implementation over the period 2023–2025, including the creation of:

1. **A Technopark at S. Seifullin Kazakh Agrotechnical Research University** ("Development of New Technologies for Organic Production and Processing of Agricultural Products").

The uniqueness of this technopark lies in the establishment of vertically integrated agrotechnological enterprises, encompassing the full cycle of organic production and distribution:

- Raw material production – organic crop and livestock farming;
- Production of organic feed, feed additives, bioproducts, and fertilizers;
- Production of food products labeled "Organic";
- Marketing and sales of finished products on domestic and export markets.

2. **A Technopark at K.I. Satpayev Kazakh National Technical University** ("Integrated Development of a Sustainable Construction Industry: Innovative Technologies, Production Optimization, Efficient Use of Resources, and Establishment of a Technopark").

The program is expected to result in the development of a range of new construction materials and products, manufactured at the facilities of the complex using industrial waste from Kazakhstan. These will be produced through both advanced traditional methods and newly introduced technologies, as well as include new functional components of existing construction materials.

3. **An Engineering Center at L.N. Gumilyov Eurasian National University** ("Establishment of a Construction Engineering Center to Provide a Full Cycle of Accredited Services for Kazakhstan's Construction and Road-Building Sectors").

The program aims to create the first Construction Engineering Center in Kazakhstan, serving as a driver for the provision of new accredited services for the full cycle of analysis and quality assessment of road, construction, and engineering products. A special emphasis is placed on the operation of accredited high-precision equipment.

4. **An Engineering Center at K.I. Satpayev Kazakh National Technical University** ("Development of Resource-Saving Energy-Generating Technologies for the Mining and Metallurgical Complex and Establishment of an Innovative Engineering Center").

The establishment of such an engineering center will enable comprehensive scientific

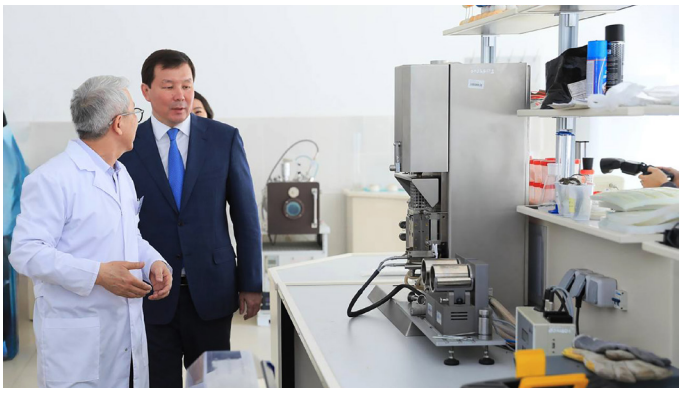
research in various fields, including chemistry, physics, and materials science. Its laboratories will complement one another through interdisciplinary studies, creating opportunities for in-depth research in the thermodynamics and kinetics of complex chemical-metallurgical systems, as well as unique investigations into the physicochemical properties and interfacial surfaces between different multicomponent phases.

In addition, under the directive of the Head of State, at the end of **2024** the implementation of **five programs** for the period 2024–2026 was launched [50], namely:

"Development of New Technologies for the Processing of Technogenic Waste with the Improvement of the Environmental Situation in the Western Region."
Implementing institution (based on competitive selection): K. Zhubanov Aktobe Regional University. Budget: **2.9 billion tenge.**

Program objective ↓
The goal of the program is to reduce the anthropogenic impact of industrial facilities on the natural environment through the application of new technological and technical solutions. A Scientific and Technological Center with elements of a Center of Academic Excellence (CAE) will be established in the Western region, incorporating three laboratories – in metallurgy, materials science, and chemistry – to provide research services to enterprises of the mining and metallurgical industry.

«Development of Integrated Energy-Saving Technologies for Enhancing Environmental Sustainability and Efficiency of Marine Operations in the Kazakhstani Sector of the Caspian Sea».
Implementing institution (based on competitive selection): Sh. Yessenov Caspian University of Technology and Engineering.
Budget: **4 billion tenge.**



Program objective ↓
The program aims to develop technologies for the efficient use of marine operations and to conduct research on the technological advancement of economic efficiency, maritime infrastructure, and management of marine operations in the Kazakhstani sector of the Caspian Sea. This will be achieved through energy-saving technologies, route optimization, and measures to prevent oil spills, thereby strengthening the ecological sustainability of the Caspian region. The program also provides for the establishment of a Scientific and Technological Center with elements of an Academic Center of Excellence, including a comprehensive laboratory for prototyping marine equipment and technologies, as well as the creation of three research laboratories in ecology, hydrogen energy, and digital modeling.

«Development of Innovative Technologies in Medicine, Biotechnology, and Ecology, and the Creation of Modern Infrastructure for the Sustainable Development of the Aral-Syrdarya Region».
Implementing institution (based on competitive selection): Khoja Akhmet Yassawi International Kazakh-Turkish University.
Budget: **3.9 billion tenge.**

Program objective ↓
The purpose of the program is to conduct comprehensive research in the fields of medicine, biotechnology, and ecology, as well as to develop scientific and practical approaches to the effective management of biological resources to ensure integrated and sustainable innovative development of the Aral-Syrdarya region. Within the **Yassawi Center of Academic Excellence**, 13 laboratories will be established (medicine: 8 laboratories, biotechnology: 2 laboratories, ecology: 3 laboratories).

«Development of Resource-Saving Technologies for the Advancement and Management of Water Resources and Kazakhstan's Processing Industry, and the Creation of an Innovative Engineering Center».
Implementing institution (based on competitive selection): M. Kh. Dulaty Taraz University.
Budget: **2.8 billion tenge.**

Program objective ↓
The program aims to develop innovative technologies to ensure water security, improve the efficiency of water and land resource use, and provide scientific justification for projects in the development and management of water resources, agriculture, and Kazakhstan's food and light industries. It envisions the creation of new materials and food products, as well as the establishment of a **Scientific, Technological, and Engineering Cente**r to provide a full cycle of accredited services in the field of water resources and the processing industry. The center will include at least seven laboratories and a knowledge transfer center for specialists in water management, agriculture, and the processing industry.

«Development and Implementation of Competitive, Science-Based Technologies to Ensure the Sustainable Development of the Mining and Metallurgical Industry in East Kazakhstan Region».
Implementing institution (based on competitive selection): D. Serikbayev East Kazakhstan Technical University.
Budget: **4 billion tenge.**

Program objective ↓
The purpose of the program is the development and implementation of competitive, science-based technologies

to ensure the sustainable development of the mining and metallurgical industry in the East Kazakhstan region.

Currently, universities and enterprises are implementing a number of new projects, funded through both their own and attracted resources, aimed at establishing and equipping technology parks, engineering centers, and other elements of scientific and technological infrastructure (testing grounds, workshops, fab labs, incubators, technoparks, etc.) in cooperation with large enterprises and international partners ▼:

° **Yessenov Technopark" at the Caspian University of Technology and Engineering in Aktau.**

The construction of Yessenov Technopark is being completed with the university's own funds and is scheduled to be commissioned at the end of 2024. The two-story complex will be equipped with more than 80 types of modern machinery, diverse equipment, and computers with the latest software.

° **MIT-standard Laboratory** (Workshop) **at KazNRTU in Almaty, established in partnership with Kazakhmys Corporation.**

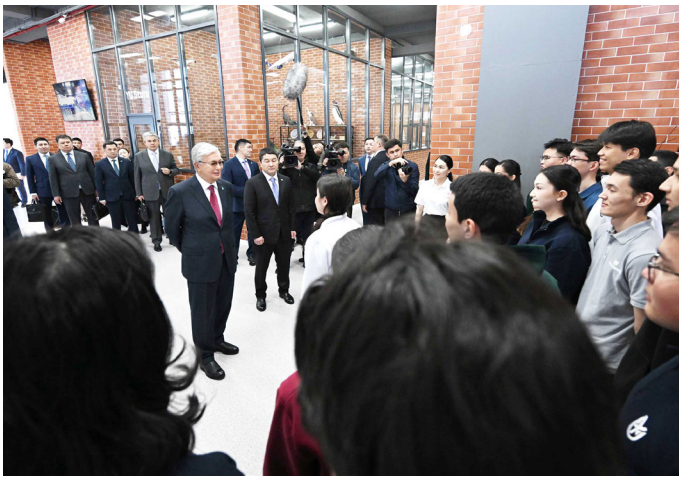
The laboratory was opened in November 2024. It is equipped with modern facilities for digital manufacturing. Students are able to implement their projects using 3D printers, laser cutters, milling machines, and other innovative equipment.

° **Innovation Training Center "Luban Workshop" and "SMART Automotive Technology Laboratory" at D. Serikbayev East Kazakhstan Technical University in Ust-Kamenogorsk, created jointly with Tianjin Vocational Institute (PRC).**

The Luban Workshop is an authorized center for training engineers and technicians in the diagnostics, maintenance, and repair of electric vehicles and internal combustion engines of Chinese production. It serves as a platform that integrates advanced technologies, education, and science to create new opportunities in the electric vehicle industry and related fields. Future plans include the opening of a Smart Engineering Driving Center.

° **Hi-Tech Campus: Industrial Testing Ground at Atyrau University of Oil and Gas in partnership with Embamunaigas JSC** (a subsidiary of NC KazMunayGas).

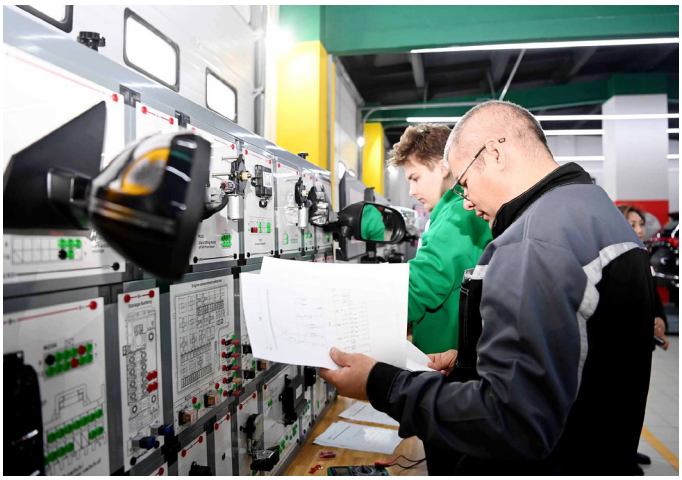
This large-scale project, covering 4 hectares in the Atyrau region, is aimed at training specialists for the oil and gas industry, supporting the commercialization of research, and developing practical skills. The testing ground includes zones for well workover and geophysical surveys, oil production and storage, as well as training facilities for electricians, welders, and machinists.



° **Akylbayev Research Center at Buketov Karaganda University is a new 2,000 sq. m research facility.** The complex will host a commercialization project park, a business incubator, scientific laboratories, a startup zone, and other research units.

In addition to the ongoing projects, the following technological and scientific-engineering parks are currently operating in Kazakhstan:

1. **Alatau Technopark** (Almaty) – managed by SEZ PIT Management Company LLP, is a leading innovation center providing infrastructure and support for high-tech companies and startups
2. **Nuclear Testing Park** (Kurchatov, Abai Region) – Specializes in supporting projects in the field of nuclear energy and radiation safety. The park promotes research and development aimed at the safe use of atomic energy.



3. **Scientific and Technological Park of Al-Farabi Kazakh National University** (Almaty) – Established at Al-Farabi Kazakh National University, this technopark focuses on advancing scientific and research initiatives in partnership with the university.
4. **NURIS** (Nazarbayev University Research and Innovation System) (Astana) – The Nazarbayev University technopark, providing a platform for startups and research projects related to high-risk technologies and innovations.
5. **Astana Hub** (Astana) – An international IT startup technopark, known as the largest center for supporting IT entrepreneurship in Kazakhstan. It offers opportunities for technology startups, ranging from financial support to business strategy consulting.
6. **Innovative Technological Park "Yertis"** (Pavlodar) – Managed by Toraighyrov University LLP, this park serves as a hub for promoting innovations and technologies in northern Kazakhstan.
7. **Abai IT Valley** (Semey, Abai Region) – A technopark under Alikhan Bokeikhan University, focused on IT education and supporting digital technology startups.
8. **Sary-Arka Technopark** (Karaganda) – Provides a platform for startups and tech enterprises, supporting the development of innovation in Central Kazakhstan.
9. **AgriTech Hub KazNARU** (Almaty) – Established at Kazakh National Agrarian Research University, this agro-technological hub promotes agricultural technologies, attracting scientific and technological partners to enhance agriculture in the country.
10. **Shygys-BASTAU Innovation and Technology Park** (Ust-Kamenogorsk) – Aimed at developing high-tech projects and supporting innovative startups in the East Kazakhstan region.

7.2. Successful Examples of Science, Education, and Business Integration: Best Practices of Kazakhstani Universities

The Ministry of Science and Higher Education of the Republic of Kazakhstan actively supports partnerships between Kazakhstani science and the priorities of major industries. A vivid example of successful collaboration is the organization of science and technology sessions.

In 2024, seven such sessions (hackathons) were held across different cities of Kazakhstan. Each session focused on addressing scientific and industrial challenges, developing solution prototypes, and drafting technical specifications for program-targeted funding. The number of participants ranged from 50 to 100, including scientists and industry experts. The sessions were organized in cooperation with the country's leading enterprises, which ensured the relevance and practical value of the problems being solved.

The main areas of tasks addressed during the science and technology sessions included:

- extraction and processing of valuable metals,
- ecology and waste management,
- digitalization and process automation,
- improving production efficiency,
- soil treatment and irrigation in the agro-industrial sector,
- ensuring technical safety and protecting employee health.

As a result, more than 400 scientists and experts participated in the sessions, and over 100 scientific and technical solutions were formulated in response to company needs. At the meeting of the National Scientific and Technical Council (NSTC), 11 technical specifications were presented based on the outcomes of science and technology sessions with Kazakhmys, ERG, and Kazatomprom.

Thus, **10% of the total volume of scientific and technical assignments were based on the results of direct collaboration with major enterprises.**

Within the framework of the 2023–2026 scientific and technical programs, stable and result-oriented cooperation has been established with the private sector, industry associations, specialized research institutes, government bodies, and national companies.

The formats of interaction vary from joint implementation of programs and creation of consortia to investment agreements, applied research contracts, and engagement of specialists as consultants and researchers. A number of projects are carried out under confidentiality agreements with business partners.

KazATU Program:

Participants include the Shchuchinsk District Akimat, Akkayin District Akimat, the Union of Organic Producers of Kazakhstan (NGO), LLP Enbek, LLP A.I. Baraev Grain Farming Research and Production Center, and LLP North Kazakhstan Agricultural Experimental Station.

Scholars from Nazarbayev University are also involved in the project as individual participants.

ENU Program:

Consortium participants: L.N. Gumilyov Eurasian National University, Astana City Akimat, RSE National Center for Quality of Automobile Roads, JSC KazNIISA, D. Serikbayev East Kazakhstan Technical University, and LLP KazConstraction.

Cooperation agreements and memoranda signed with:

- LLP ERG Recycling (ERG Group) – Cooperation Agreement (October 9, 2024)
- LLP Kazakhstan Petrochemical Industries Inc. (JV of NC KazMunayGas) – Memorandum of Cooperation (July 26, 2024)
- LLP Standard Cement – Cooperation Agreement (March 26, 2024)
- JSC KazdorNII (Committee of Automobile Roads) – Memorandum of Cooperation (June 18, 2024)
- JSC Passenger Transportation (NC Kazakhstan Temir Zholy) – Memorandum of Cooperation (February 28, 2024)
- LLP KAZ CERAMICS – Memorandum of Cooperation (October 16, 2024)
- LLP TEN Cert Pro – Cooperation Agreement (April 25, 2024)

Research and testing contracts were concluded with:

- Kazakhstan Association of Autoclaved Aerated Concrete Producers (NGO), LLP Senim NC, LLP Ekoton+, LLP Solid Research Group, LLP Jol Science Technology Institute, LLP Astana Capital.

KazNITU Programs:

Co-executors include:

- D. Serikbayev East Kazakhstan Technical University, M. Auezov South Kazakhstan University, JSC Institute of Metallurgy and Ore Beneficiation, Department of Entrepreneurship and Investment of Almaty City.
- Al-Farabi Kazakh National University, branch of the National Center for Complex Processing of Mineral Raw Materials (under the Industrial Development Committee of the Ministry of Industry and Infrastructure Development), and the D.A. Kunaev Institute of Mining.

Contracts were signed with LLP Astana MM-Group, LLP Bapy Metals, LLP AltynMinerals, and LLP Fe Mn Technology.

In addition, the Engineering Center signed a co-financing agreement with ERG and a contract for contractual R&D with LLP KazakhGold.

It should be noted that the selection of topics and scientific-technical assignments for the implementation of programs funded from the state budget, in accordance with the legislation, is approved by the Higher Scientific and Technical Commission under the Prime Minister.

In addition to government agencies, the Commission includes the top leaders of the National Academy of Sciences, research institutes, the National Chamber of Entrepreneurs "**Atameken**," JSC "**Samruk-Kazyna**" **Sovereign Wealth Fund, national companies** (subsidiaries of Samruk-Kazyna: NAC Kazatomprom, NC KazMunayGas, NC QazaqGas, KEGOC), as well as major private enterprises (Kazakhmys Corporation, Eurasian Group, QarMet, and KAZ Minerals Management). A number of these companies were included in the Commission in 2024 specifically to foster cooperation and implement joint projects aimed at developing scientific and technological infrastructure (technology parks, engineering centers, testing sites, etc.).

Thus, with the signing of the Law of the Republic of Kazakhstan "On Science and Technology Policy" by the President of Kazakhstan on July 1, 2024, a systemic implementation of the Head of State's directive on the development of science and technology has become possible, including the successful realization of the following measures:

- A legally established mechanism for the implementation and financing of projects has been introduced, providing for the processes stipulated by law: selection of priority areas, approval of technical specifications, competitive procedures for state procurement, monitoring, and reporting.
- The implementation of the directive is carried out jointly with private enterprises, national companies, industry associations, government agencies, and others.
- Project approval and oversight are ensured at the government level, chaired by the Prime Minister and involving the National Chamber of Entrepreneurs "Atameken," JSC "Samruk-Kazyna" Sovereign Wealth Fund, and major corporations.
- The launch and implementation of projects are envisaged throughout the entire term of the directive (until December 2026).
- Regional specifics of the programs are taken into account, with a focus on addressing technological challenges as well as the socio-economic and environmental priorities of the regions. Coverage extends to all geographic areas of Kazakhstan.

- All selected and planned projects align with the approved priority areas of Kazakhstan's scientific and technological development, ensuring coverage across all such priority fields.
- All projects are aimed at the comprehensive establishment and equipping of laboratory, testing, and engineering infrastructure to create centers of technological competence, certification, and academic excellence.
- A key requirement for project implementation is commercial efficiency and economic feasibility. Expected final outcomes outlined in the scientific and technical assignments and contracts include pilot production of high-tech products, private co-financing and investments, commercialization of research developments, and cooperation with the business community.
- A wide range of national and regional universities and research institutes are engaged in the implementation of the directive, both as lead organizations and as co-executors and partners. Given that the two highest-ranking universities in the country (Nazarbayev University and Al-Farabi Kazakh National University) are the most equipped with research and innovation infrastructure (NURIS Technopark, Al-Farabi KazNU Science and Technology Park), funding priority has been given to less materially equipped universities. However, the academic staff, researchers, scientific potential, and infrastructure of these leading universities are actively involved in project implementation.

Project: Development of Technology for Producing Vanadium Mixed Oxides for Vanadium Redox Flow Batteries

The applicant for the project is LLP 'Physical-Technical Institute,' and the grant recipient is LLP 'Balausa Company.' The aim of the project is to develop and refine the technology for producing vanadium mixed oxides for the subsequent production of vanadium electrolyte, required for vanadium redox flow batteries. Dry vanadium electrolyte is a new material for use in vanadium redox flow batteries, addressing the main issue of battery charging, as it allows the electrolyte to be prepared on-site, eliminating the need to transport liquid electrolyte. To date, project sales have amounted to

280 826 225,70 tenge,

including the export of vanadium pentoxide to Austria and the Russian Federation

Project: Implementation of the Method for Intensifying Mining Operations Using Steeply Inclined Ore Layers in the Open-Pit Development of Deep-Seated Ore Deposits

The applicant and grant recipient for this project is JSC 'Kazakh National Research Technical University named after K.I. Satpayev.' The aim of the project is the implementation and commercialization of the method for intensifying mining operations using steeply inclined ore layers in the open-pit development of deep-seated ore deposits.

The proposed mining intensification technology allows mining companies to reduce construction time and achieve the designed production capacity of the quarry by 25–40%, mitigate overburden lag by up to 30%, achieve high-rate mining operations in practice by enabling independent production of extraction operations relative to overburden, and increase the productivity of excavator-truck complexes by 25–40%.

Total project sales to date amount to

293 303 654,42 tenge.

Project: Organization of Production of Original and Elite Seeds of the New Spring Soft Wheat Variety 'Semenovna

The applicant and grant recipient for this project is LLP 'North Kazakhstan Agricultural Experimental Station.' The project introduces a new spring soft wheat variety, 'Semenovna,' to the market, adapted to adverse environmental conditions. It has passed the State Variety Testing of the Republic of Kazakhstan and is approved for sowing in the North Kazakhstan region.

The variety belongs to the mid-maturing group, is tall (plant height – 82 cm), and resistant to drought, high temperatures, and lodging.

The 1000-grain weight is 37.4 g, protein content – 14.86%, and gluten – 28.4%. The average yield in state variety testing on a fallow predecessor was 32.6 c/ha, exceeding the standard by 4 c/ha. In production trials, the average yield was 42.4 c/ha, exceeding the standard by 9.4 c/ha or 28%.

Project sales to date amount to

195 290 000,00 tenge.

Project: Commercialization of the BioLyp Bioproduct with Adhesive Properties to Enhance the Effectiveness of Plant Protection Products and Fertilizers

The applicant and grant recipient is LLP 'EcoSave.' The project introduces a new domestic bioproduct with adhesive properties, 'BioLyp,' for commercialization – a safe adjuvant based on natural polymers that helps plant protection products and fertilizers adhere to plant surfaces and penetrate into them.

This product increases the contact area of plant protection products and foliar fertilizers with the leaf surface, significantly enhancing the effectiveness of the active components in working solutions. It allows the use of minimum recommended doses of agrochemicals without losing treatment efficiency, thereby reducing procurement costs. For example, the savings for a farmer per hectare amount to 2,850 tenge, or 17%.

To date, sales of the new BioLyp product have exceeded the grant amount and totaled

703 942 350,00 tenge.

Project: Organization of Industrial Production of BRUVAC® and BRUCON® Vaccines Against Brucellosis in Farm Animals According to GMP Standards

The applicant and grant recipient is LLP 'Scientific and Production Enterprise "Antigen".' The project introduces for commercialization the BRUVAC® vaccine against brucellosis in sheep and goats for conjunctival application, and the BRUCON® vaccine against brucellosis in cattle for conjunctival application, both produced at an industrial scale.

For the first time, technologies for deep cultivation of Brucella abortus biovar Abortus (strain S19) and Brucella melitensis Rev-1 strains were developed, with improved nutrient media composition and the implementation of effective biomass concentration methods. The conjunctival vaccination method significantly reduces the intensity and duration of serological reactions post-vaccination, making the use of this vaccine compatible with brucellosis control programs recommended by international epizootic bureaus. Project sales to date amount to

20 353 602,50 тенге.

CONCLUSIONS

The development of university science and innovation infrastructure in Kazakhstan has taken on a systemic and multifaceted character in recent years. The state has been consistently strengthening the scientific potential of universities, stimulating technology transfer, integration with business, and international cooperation.

The data and examples presented in this chapter allow for the following key conclusions:

First, a solid legislative and institutional framework has been established: the Law "On Science and Technology Policy" has been adopted, procurement rules for research institutes and universities have been updated, the status of the National Academy of Sciences has been strengthened, and the National Council for Science and Technology has been created. These measures have created favorable conditions for research and for the strategic management of the scientific sphere.

Second, human capital has been significantly strengthened through salary increases (by 18% in 2024 and by 17% in 2025), higher allowances for academic degrees, the launch of a preferential housing program for young researchers, as well as increased doctoral grants and international mobility opportunities.

Third, research and innovation infrastructure is expanding: a network of research universities, 2,297 projects and 162 scientific and technical programs in 2024, the establishment of technology parks, engineering centers, and laboratories across the country, all of which ensure the applied nature of research and balanced regional development.

Fourth, the integration of science, education, and business is being reinforced: the startup ecosystem has grown to 357 new projects in six months, accelerators and venture funds are operating, and scientific and technological sessions are being held with the participation of ERG, KazMunayGas, Kazakhmys, and others. This enhances the commercialization of research and aligns scientific activity with industry needs.

Fifth, the key challenge remains the imbalance in funding sources: about 70% of science expenditures are covered by the state. For sustainable growth, it is essential to significantly increase the share of private investment through tax incentives, subsoil user obligations, and public-private partnership mechanisms.

Chapter 8.

The Social Mission of the University: Identity, Civic Education, and Equal Access (Akmaral)

8.1. The University as a Center for Shaping the National Identity of Youth

The modern understanding of the university goes far beyond the traditional role of an exclusively educational institution. According to the Concept for the Development of Higher Education and Science in the Republic of Kazakhstan for 2023–2029 [ ], the university represents a multifaceted center whose mission includes not only academic instruction but also personality development, the cultivation of civic responsibility, and the fulfillment of the so-called **"third mission."**

The Concept emphasizes that universities are key players in shaping social capital, fostering an innovative environment, and, most importantly, building the **national identity of youth.**

In the context of a rapidly changing and globalized world, where young people are confronted with an abundance of information and diverse cultural influences, the university's role as a cornerstone that unites the educational process with the tasks of strengthening self-awareness, cultural values, and civic engagement becomes critically important.

To work effectively with students, the Ministry of Science and Higher Education, together with universities, continues to

actively pursue comprehensive ideological and educational initiatives. These measures are aimed at instilling in students key values such as social responsibility, patriotism, and the foundations of religious education. Special attention is given to promoting the concepts of the "working person," tolyk adam (the holistic individual), adal azamat (the conscientious citizen), as well as the principles of "**law** and **order**.".

In general, the promotion of the values of the

«Working Person»

aligns with the life goals of every individual. It is of utmost importance to convey the understanding that only through the **accumulation of knowledge and commitment to labor** can financial independence and self-reliance be achieved.

Comprehensive measures are being implemented to promote among students the concept of

«Adal adam – Adal enbek – Adal tabys»

(Conscientious Person – Honest Work – Decent Income). Each year, on the last Sunday of September, the country celebrates **Labor Day.** Universities organize thematic competitions such as **"Honest Work – The Value of Life"** and **"Only Through Labor Does One Become Truly Great!"** In 2024, more than 140 events were organized dedicated to topics including **"The Working Person in Modern Society."**

The preservation and enhancement of the moral, spiritual, and cultural values of the younger generation are carried out through a number of significant projects:

«Ұлы дала мұрагерлері»,

(Heirs of the Great Steppe), which includes the nationwide expedition **"Туған елге тағзым"** (Homage to the Motherland). Other important social projects include **"Тарих тағылымы"** (Lessons of History), "Қазақ мәдениетінің антологиясы" (Anthology of Kazakh Culture), **"Туған жер"** (Native Land), "Sacred Geography of Kazakhstan," and "Modern Kazakh Culture in the Global World." Equally significant are projects integrated into the course "Service to Society."

In 2023, in order to systematize and increase the effectiveness of this work, **Methodological Recommendations on the Organization of Educational Work in Higher and/or Postgraduate Education Institutions** [52] were approved. These Recommendations are aimed at improving and building an effective system of educational activities within universities. They are focused on creating favorable conditions for the spiritual development of students based on universal values, supporting them in their life choices, and fostering their moral, civic, and professional formation, thereby ensuring broad opportunities for personal self-realization.

To widely promote the ideology of the great thinker Abai among students and faculty, **Abai Centers** have been established in higher education institutions across Kazakhstan.

Abai Kunanbayuly's teaching on the

Tolyk Adam

(Perfect or Complete Person) is intended to serve as the foundation for shaping a spiritually mature younger generation. According to this teaching, a person progresses from the state of a "**half person**" to a "**person**," and ultimately to a "**complete person**." This highest stage represents the goal of spiritual renewal, a state to which many aspire, but which can only be achieved by a select few endowed with special qualities. Thus, on the path to spiritual perfection, the great thinker

places the concept of "Tolyk Adam" at the pinnacle of human development.

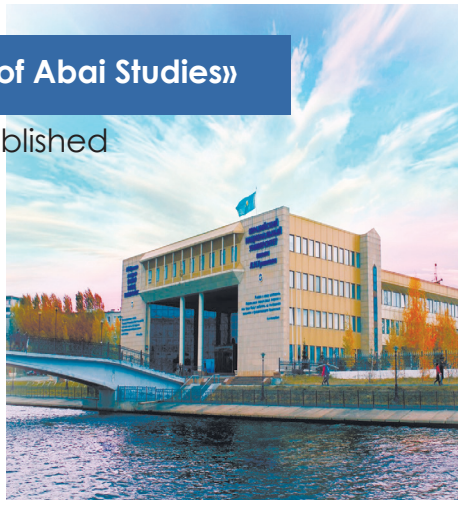
The concept of "**Tolyk Adam**" is aimed at fostering spiritually accomplished citizens. Therefore, it must become the key guiding principle in preparing specialists imbued with a patriotic spirit.

To achieve these goals, specialized centers and institutes have been opened and are now functioning at leading universities across the country.

For example,
at L. N. Gumilyov Eurasian National University, the Scientific Institute

«Academy of Abai Studies»

has been established



Abai Kazakh National Pedagogical University has

«Abai Cente»

Institutes have been established at Al-Farabi Kazakh National University and Shakarim University of Semey

«Abai »,

The centers are engaged in conducting scientific research, promoting Abai's teachings in the field of social sciences, developing methodological materials on Abai Studies for students, as well as studying and disseminating Abai's creative heritage

Educational initiatives are being carried out to promote and popularize the practice of wearing national clothing as an essential component of ethnic identity.

Throughout the academic year, in accordance with planned schedules, curatorial sessions are held in student groups on topics such as "What Does Traditional Clothing Mean?", "Kazakh National Dress: Origins and Future," and others. Faculty members teaching

the Kazakh language and the history of Kazakhstan play a significant role in promoting national dress.

On the occasions of "**National Costume Day**" and the Nauryz national holiday, student curatorial teams and activist groups organize various events and mutual challenges such as "**National Clothing – Reflection of the Nation**", "**Ethno Kun**", competitions like "**Bayan Sulu and Kozy Korpesh**", "**Best National Attire**", exhibitions under the theme "**National Clothing – Reflection of the Nation**", and festivals such as "**Nauryz Fest,**" all aimed at fostering in students an appreciation of Kazakh traditions and values.

In addition, to further popularize national clothing among students, staff, and faculty, certain universities–such as Toraighyrov University, O. Zhanibekov South Kazakhstan Pedagogical University, Utemisov West Kazakhstan University, I. Altynsarin Arkalyk Pedagogical Institute, and the Academy of Logistics and Transport–have designated Thursdays and Wednesdays as National Clothing Days.

Fashion shows, ethno-defiles, competitions for creating the most original costumes in ethno-style ("**Ulttyq Sezim**" – National Spirit), exhibitions by student clubs ("**Defile**"), flash mobs, and poetry contests among young akyns ("**Rukh Sardary**") are also organized.

To promote the national code, at O. Zhanibekov South Kazakhstan Pedagogical University, academic buildings have been given names such as "**Tumar**," "**Qazyna**," "**Shanyrak**," etc.–an experience recommended for other universities as well.

Furthermore, during class breaks in university halls and corridors, traditional kuis are played, including "**Adai**," "**Akku**," "**Alqissa**," "**Balbyrauyn**," "**Saryarka**," and "**Ake Tolgauy**" by renowned composers such as Kurmangazy, Dina, N. Tlendiyev, Assylbek Ensepov, and others.

In the context of working with youth, it is essential to define the key directions of modernizing public consciousness, including the formation of patriotism, the development of a culture of knowledge, the enhancement of competitiveness, legal education, the promotion of a healthy lifestyle, and the strengthening of spiritual and moral values. It is precisely the younger generation that should become the driver of these transformations, since the future of society depends on their level of awareness, education, and value orientations.

Kazakhstani patriotism

The formation of this quality among students should be associated with the ability to love their homeland, take pride in its successes and achievements, honor the great names of outstanding historical figures, remain devoted to their village, city, or region, as well as its culture, customs, and traditions. It also involves respecting the history of the country, working for its prosperity and well-being, fulfilling constitutional duties, and being a socially responsible member of society.

Implemented projects: "Open interactive lessons on the living history, art, everyday life, and crafts of the Great Steppe"

(BAYARD project); the Republican essay contest "Kazakhstan of My Dream"; the patriotic forum "Men zhastarga senemin"; the plans of the Assembly of the People of Kazakhstan, and others.

Culture of knowledge

The development of this need among students should be linked to their ability and readiness for spiritual and intellectual self-improvement, giving priority to education and the culture of learning. At its core lies the understanding that in public morality, the pursuit of spiritual growth must prevail over the pursuit of material well-being.

Implemented projects:
"**My Profession – My Future**" project; Digital University; Life-long learning; the recitation contest "**Menin Otanym – Kazakhstan**"; the "**Mentor KZ**" project, and others.

Competitiveness

Among students, this quality should manifest itself in the awareness that in modern conditions, a sought-after individual is one who is intellectually developed, competitive, creative, and healthy, with a high level of national self-awareness and critical thinking. Such a person demonstrates a strong need for self-improvement, self-development, self-assertion, and self-realization of their essential capacities. They are proficient in three or more languages, possess leadership qualities, are communicative, able to work in a team, and prepared for continuous acquisition of new knowledge, its critical evaluation, and its skillful application in non-standard situations (functional literacy) to solve arising problems. In addition, they should have both computer and digital literacy.

Implemented projects:
Creative Student League (Zhaidarman, debates, intellectual games); Student self-governance; "**100 Leaders**" project; "**Mentor KZ**" project; "**Mastercard**" project; development of soft skills and emotional intelligence (EQ); Social GPA; digital literacy programs; hackathons; regional forums of student youth, and others.

Legal education

This represents purposeful activity aimed at transmitting legal culture, legal experience, and mechanisms for conflict resolution in society from one generation to another. The main goal of legal education is to develop an individual's legal consciousness and, more broadly, the overall legal culture of society.

Implemented projects:
Concept of Anti-Corruption Policy; Academic Integrity League; Legal literacy programs (lectures, seminars, consultations); Student Ombudsman Institute; creation of conditions for students with special educational needs; crime prevention initiatives, and others.

Healthy lifestyle

For every Kazakhstani citizen, health is considered the highest value. It is intrinsically connected with sports activities, healthy nutrition, and the rejection of harmful habits, while also being associated with the cultivation of positive emotions, an optimistic worldview, and the promotion of physical activity.

Implemented projects:
Organization of the Student Sports League; Universiades and Spartakiads; meetings with specialists from Healthy Lifestyle Centers, drug rehabilitation centers, AIDS centers, and others; implementation of the Anti-Drug Action Plan; sports festivals, sports days, and others.

Spiritual and moral education

is a key priority of modern state policy in the Republic of Kazakhstan. It ensures the spiritual unity of the people and the moral values that bind them together, as well as political and economic stability. For this reason, the issues of spiritual and moral upbringing are particularly relevant to the contemporary educational system.

Implemented projects:
Annual Presidential Addresses to the Nation; the Republican Essay Contest "Kazakhstan of My Dream"; the patriotic forum "Men zhastarga senemin"; implementation of the plans of the Assembly of the People of Kazakhstan (ANK), the Concepts of Family and Gender Policy of the Republic of Kazakhstan; Psychological Service Centers, and others.

At the same time, for universities to fully fulfill their role as centers for shaping the national identity of youth, there is a need for systematic solutions to a number of pressing issues:

- In practice, there is demand for mechanisms of joint work and interaction between youth public organizations, student self-government, and the volunteer movement.
- In the context of a new quality of education, it is important to integrate the younger generation into the research and industrial-technological environment.
- Equally relevant are issues related to the need to improve educational efforts in shaping a healthy lifestyle among students, as there is a systemic decline in health in all its aspects (moral, physical, psychological, and social): substitution of life values; rising juvenile delinquency; abuse of alcohol, tobacco, and drugs; cases of suicide; and early sexual activity.

8.2. Development of Inclusive Education and Support for Socially Vulnerable Groups

Inclusive education is one of the priority areas in the development of higher education in Kazakhstan, aimed at ensuring equal access to learning for all categories of students, including persons with disabilities, orphans, students from low-income families, and other socially vulnerable groups.

In the context of the modernization of the national education system, special attention is given to creating a barrier-free learning environment, adapting academic programs and infrastructure, as well as introducing digital technologies that enhance the accessibility and quality of higher education for all segments of the population.

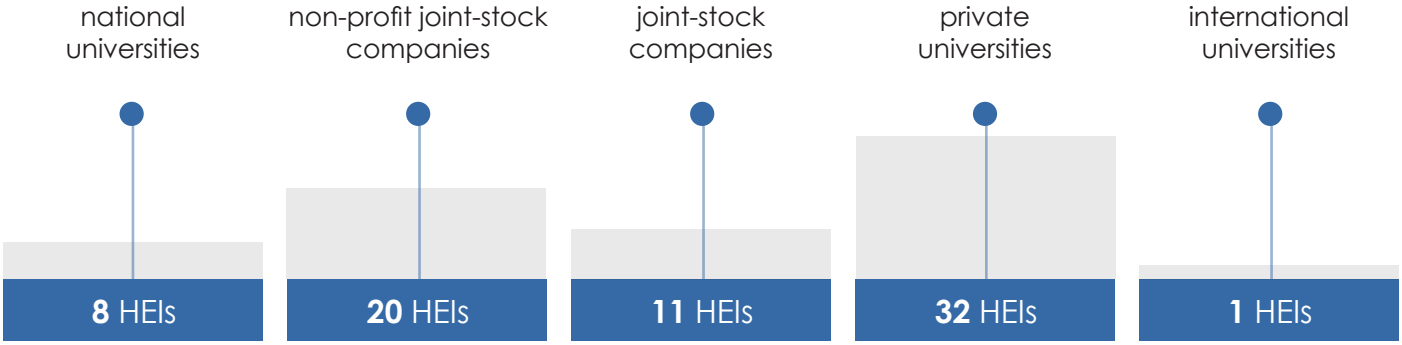
In 2024, the number of higher and/or postgraduate education institutions (HEIs) that created conditions for inclusive education reached 72 out of 103 (compared to 66 in the 2023–2024 academic year), which demonstrates positive progress in ensuring equal opportunities for students with special educational needs (SEN). ↓

As a result, the share of HEIs providing equal learning conditions for students with SEN increased to 70% (compared to 64.7% in the 2023–2024 academic year), while the share of created conditions reached 61%.

AMANZHOLOV UNIVERSITY

Discussion of Innovative Approaches in Inclusive Education

The greatest contributions to the development of an inclusive environment were made by↓



ZHETYSU UNIVERSITY

Center for Research on Special Education Issues

ABAI UNIVERSITY

Educational Laboratory for Inclusive Education

Monitoring of inclusiveness in the educational environment of Kazakhstani universities was carried out across a number of key parameters reflecting the accessibility of infrastructure and educational resources [53].

- **37** HEIs — 36% — have specialized textbooks
- **91** HEIs — 88% — Psychological and pedagogical support has been organized, including inclusion support offices and the work of teaching assistants
- **65** HEIs — 63% — Specialized teachers are employed (the total number is 4,372)
- **77** HEIs — 75% — 5,389 teachers have undergone professional development (training teachers to work with students with special educational needs)

The development of inclusive education also involves the adaptation of academic programs:

- Curricula have been developed taking into account the special educational needs of students — 40,7% — **42** HEIs
- Individual development programs have been implemented — 12% — **12** HEIs

Improving the physical accessibility of academic buildings remains an important priority

- 93% — **96** HEIs — Ramps have been installed
- 75% — **77** HEIs — Elevators and lifts have been installed
- 82% — **85** HEIs — Doorways have been widened

In addition, 86 universities (83%) have adapted sanitary facilities, and 43 HEIs (42%) provide support for students with musculoskeletal disorders.

Housing conditions also play a significant role in ensuring a comfortable learning environment. In 2024, 568 students with SEN lived in dormitories, representing a significant share of the total number of students in this category. The accessibility of dormitories and their adaptation to the needs of students with disabilities remains a priority for universities, requiring continuous monitoring and modernization of infrastructure.

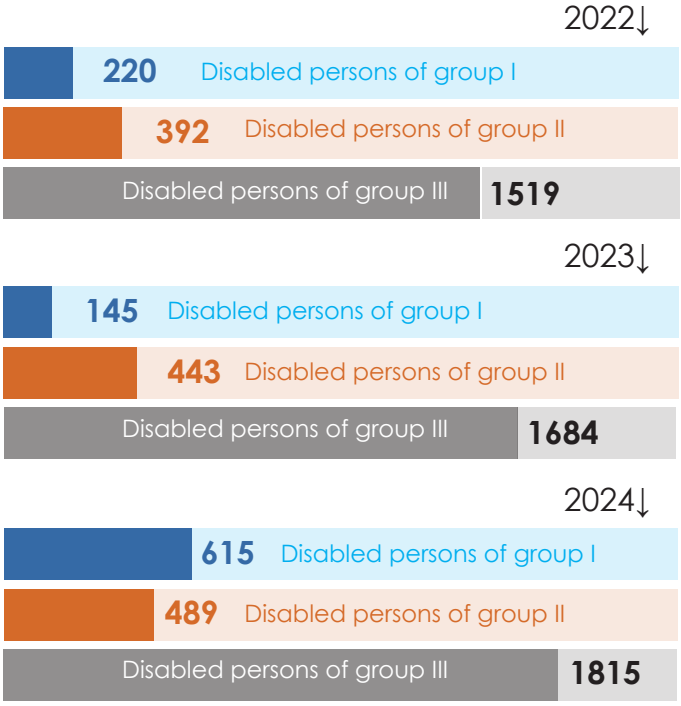
In 2024, a total of 2,919 students with SEN were enrolled in Kazakhstani HEIs, representing 0.46% of the total student population (625,990).

1,458 men
1 461 women

indicates an even gender distribution among this category of students.

The structure of students with special educational needs (SEN) by disability groups shows that the majority (1,815 students) belong to the third disability group, 615 students are classified under the first group, and 489 under the second group (Diagram 8.2.1.). Chart 8.2.1 demonstrates a steady trend of increasing numbers of students with disabilities in the education system from 2022 to 2024. The growth is particularly notable among students with Group III disabilities, as well as a significant

Diagram 8.2.1.
Number of Students with Disabilities in 2022–2024, persons.



rise in the number of Group I students in 2024, which may indicate improved accessibility of education. These data highlight the need for a differentiated approach in organizing the educational process and creating conditions that meet the individual needs of students with various health limitations.

The largest number of students with SEN are enrolled in the field of Education (792 students), which may indicate a high level of program adaptation and accessibility. At the same time, the lowest number of students is recorded in Veterinary Science (16 students), which is likely due to insufficient adaptation of curricula and infrastructure. In addition, a significant number of students with SEN study in the fields of Information and Communication Technologies (544 students) and Business, Management, and Law (280 students), reflecting both their demand and relative accessibility. In contrast, the fields of Agriculture and Veterinary Science may require additional measures to improve inclusion and program adaptation.

Table 8.2.1.
Number of Students with SEN by Level of Education.

Education level	Number of studentswith special educational needs	Share, %
Bachelor's degree	2841	97,3%
Master's degree	28	1,0%
Doctoral degree	5	0,1%
Internship	26	0,9%
Residency	19	0,6%
Total	**2919**	

Table 8.2.2.
Number of SEN students participating in scientific activities by field of education

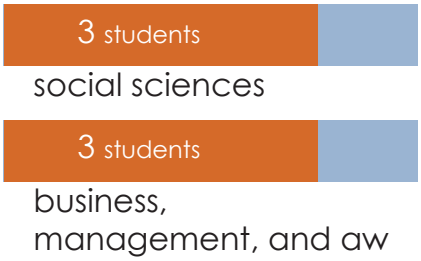
Field of education	Number of SEN students
Educational Sciences	27
Humanities and Arts	19
Social Sciences and Journalism	14
Business, Management and Law	27
Natural Sciences	26
Information and communication technologies	28
Engineering, education and construction industries	29
Agricultural sciences	1
Veterinary science	1
Health and social security (medicine)	10
Services	27
Total	**209**

The distribution of students with SEN by year of study shows that the largest share is concentrated in the 1st year (945 students), which may be associated with the expansion of support measures and accessibility of higher education.

The majority of students with SEN are enrolled in bachelor's programs – 97.3% (2,841 students) (Таблица 8.2.1.).In master's programs, there are 28 students; in doctoral programs, 5 students; in internships, 26 students; in residencies, 19 students; and in second higher education (full-time), only 2 students (Table 8.2.2). This highlights the need for further measures to expand access to master's and doctoral programs for students with SEN.

A crucial dimension of inclusive education is the subsequent employment of graduates with special educational needs (SEN). In 2023–2024, the employment rate of such graduates ranged from **30%** to **40%**, which corresponds to approximately **1,400–2,800** individuals. This figure highlights the need to strengthen support measures that facilitate the transition of students with SEN from education to professional activity. Such measures include aligning curricula with labor market requirements, expanding practice-oriented training, and fostering closer partnerships with employers.

Expanding educational opportunities for students with SEN also involves their participation in academic mobility programs. In 2024, 23 students with SEN took part in academic mobility across various fields of study. The largest number of participants were enrolled in programs in social sciences



4 students
healthcare
3 students
services

Additional areas included education, arts and humanities, natural sciences, information and communication technologies, and engineering. Nevertheless, the overall participation of students with SEN in academic mobility remains relatively low, underscoring the necessity of developing additional support mechanisms and removing barriers to their engagement in international and inter-university educational programs. ↓

One of the key factors influencing the participation of students with SEN in academic mobility is their level of foreign language proficiency.

Of the total number of students with SEN,

A1 **664** people English language	A2 **817** people English language
B1 **167** people English language	B2 **125** people English language
C1/C2 **13** people English language	**2** people German language

These figures point to the urgent need to strengthen language training for students with SEN, which could significantly enhance their participation in academic mobility programs and contribute to the broadening of their educational opportunities.

As part of monitoring the integration of students with SEN into the scientific and academic environment, their active participation in various activities has been identified.

In 2024, a total of 209 SEN students took part in educational and scientific initiatives, which contributed not only to their academic development but also to the formation of an inclusive educational environment (Table 8.2.2).

Formats of participation of SEN students: ↓

1 ↘ Olympiads and hackathons

intra-university and international **olympiads** (Smart Brain, Scope Game, the XV Republican Subject Olympiad); the Republican Hackathon **"KUICKACK '2024"**; participation in **startup projects.**

2 ↘ Scientific conferences and forums

International **Conference IACSIT** (Malaysia); International Scientific and Practical **Conference "Topical Issues of Rhetoric"**; International Student Scientific and Practical **Conference "Youth Digital Forum"**; international conferences dedicated to the 100th **anniversary of Amen Khairov**.

3

Competitions and creative initiatives

competitions organized by the Department of Education of Almaty Region; **contest "Best Web Portfolio"**; intellectual games and projects, including **StartUp Project and robotics initiatives** (3D printing of components).

Universities play a key role in ensuring accessibility and equity in education, serving not only as centers of knowledge but also as examples of social responsibility. Supporting students from socially vulnerable groups is an important task aimed at creating an inclusive educational environment and expanding opportunities for all segments of the population.

Currently, in higher and postgraduate education institutions in Kazakhstan, there are

51,641 people, 8.2% of the total number of students in the country (625,990 people)

(Table 8.2.3.).

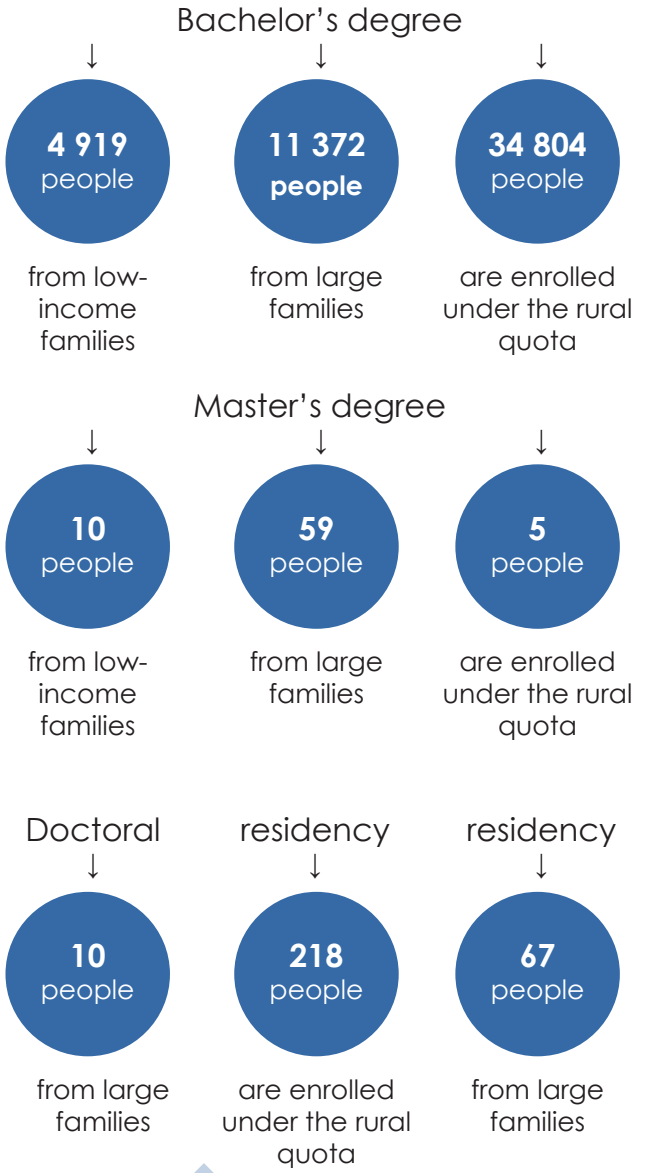
In 2024, as part of ensuring access to higher education for representatives of socially vulnerable groups, the following numbers of students are enrolled in higher and postgraduate programs:

- **51 095** people — Bachelor's degree
- **74** people — Master's degree
- **10** people — Doctoral program
- **395** people — Medical residency
- **67** people — Residency

Table 8.2.3.

Students from socially vulnerable groups in HEIs of Kazakhstan.

Категория	Количество обуч-ся	%
Students from low-income families	4956	9,6
Students under the rural quota	11593	22,4
Students from large families	35095	68
Total	**51641**	



Thus, students from large families constitute the largest share across all levels of higher and postgraduate education, including doctoral studies.

The most popular fields of study among students from socially vulnerable groups are those related to engineering, manufacturing, and construction, with **12,022** students enrolled in 2024 (23.3% of the total). A significant proportion is also represented in the following fields of education:

12 135 students 23,5% Education	
4 944 students 9,6% Health and welfare	**5 481** students 10,6% Information and communication technologies
2 923 students 5,7% Natural sciences	**3 145** students 6,0% Business, administration, and law
5 934 students 11,5% Arts and humanities	**2 678** students 5,2% Services
1 135 students 2,2% Social sciences and journalism	**827** students 1,6% Agriculture
327 students 0,6% Veterinary	**90** students 0,1% National security

In 2024, a total of 564 students from socially vulnerable groups participated in academic mobility programs. The largest numbers of participants were observed in the following fields of education:

149 students
engineering

118 students
healthcare

103 students
education

57 students
business and administration

41 students
information and communication technologies

37 students
0,1%
services

The less numerous fields are

30 students
arts and humanities

17 students
natural sciences

5 students
social sciences

5 students
veterinary

2 students
agriculture

Among all students from socially vulnerable groups,

12 179 students → are provided with places in student dormitorie

Overall, in the higher education system in 2024, 79,073 students reside in dormitories, which represents 12.6% of the total student population (625,990 students enrolled across 103 higher and postgraduate education institutions).

12 747 students → Число студентов, относящихся к социально уязвимым слоям населения, а также студентов с инвалидностью,

проживающих в общежитиях 16,12% от общего числа проживающих.

В том числе, в студенческих общежитиях проживают

568 students → с особыми образовательными потребностями

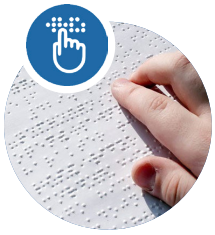
Provision of students with SEN with special learning materials.

According to data provided by higher and postgraduate education institutions, the following resources are currently available for students with SEN:

Total number of textbooks – approximately 305,903 copies, including:

electronic textbooks – more than **110,078** copies

printed textbooks – more than **194,341** copies



textbooks published in Braille – about **57** copies

textbooks in large print – about **28** copies

Taking into account linguistic diversity, the following learning resources are available:

ОКОЛО **100** about 500 books and textbooks in Russian (in both printed and electronic formats), covering a wide range of disciplines and specializations

ОКОЛО **500** approximately 300 titles in Kazakh, distributed across various institutions and also targeted at students with SEN

ОКОЛО **300** around 100 educational and scientific materials in English and other foreign languages, primarily of a specialized nature, accessible through library collections and electronic resources

Particular attention is given to the infrastructural support of inclusive education. Within the framework of the **"Modernization of Secondary Education"** project, implemented by the Ministry of Education and Science of the Republic of Kazakhstan jointly with the World Bank, a number of initiatives were launched to develop an accessible educational and methodological base. In particular, a publishing center was established to provide textbooks in Braille.In addition, several universities, including Kozybayev University and the Kazakh National Pedagogical University named after Abai, have opened centers for inclusive education.

Their primary goal is to ensure equal opportunities for students requiring additional academic support.

The creation of such structures is driven by the need to provide a comfortable and accessible educational environment for all categories of students.Inclusive education is a priority of state policy, aimed at building a fair, tolerant, and inclusive educational system.

8.3. Civic Engagement of Students and Their Role in the Public Life of the Country

Fostering an active civic stance and a high level of social responsibility among young people is one of the key priorities of modern higher education in Kazakhstan. The C**oncept for the Development of Higher Education and Science in the Republic of Kazakhstan for 2023–2029** defines the role of universities as not only centers of knowledge generation but also as platforms where students become active participants in public life, capable of contributing to the country's development. To achieve these goals, a set of measures is being implemented to involve students in various spheres of activity, develop their leadership qualities, and cultivate conscious citizenship [51].

Universities are actively working to strengthen the role of student self-governance by engaging students in collegial governing bodies of higher and postgraduate education institutions. Today, students participate in academic councils, expert groups, ethics commissions, and other working bodies, which allows them to directly influence the academic and organizational life of universities. The debate movement is actively supported as a tool for developing leadership and public speaking skills. Notably, the share of students involved in organized public activities and volunteering has already reached 40%, and by 2029 this figure is expected to rise to 65% [51]. An important step toward creating a fair and favorable environment has been the introduction of the student ombudsman institution in all 20 regions, which serves as clear evidence of the commitment to protecting students' rights and interests [54].

Each university also establishes student leagues and intellectual clubs in various

fields (arts, sports, tourism, environmental protection, etc.). Mandatory encouragement from university leadership and the awarding of incentive bonuses are foreseen. To support this, the Ministry has developed and approved the Rules for Rewarding Student Youth Enrolled in Institutions of Higher and/or Postgraduate Education for Demonstrated Patriotism and Active Civic Engagement (Order of the Ministry of Science and Higher Education of the Republic of Kazakhstan No. 437 of August 23, 2023) [55].

Strengthening the activities of student self-governance bodies has become a key priority. Such bodies have been established in nearly 90 universities, including 75 student parliaments, more than 100 debate clubs, and 120 clubs across various areas (environmental, patriotic, etc.).

One of the most important innovations has been the introduction of the integrated social GPA (Order of the Ministry of Science and Higher Education of the Republic of Kazakhstan No. 437 of August 23, 2023). This system is designed to comprehensively assess the level of student participation in university public life and volunteer activities. The developed Methodological Guidelines for the Implementation of the Integrated Social GPA take into account not only academic performance but also social engagement, research skills, and athletic achievements. This measure serves as a strong incentive for students to actively participate in community life.

Universities also play a crucial role in implementing socially significant projects, expanding types of volunteer work, and developing acceleration and mentoring programs for youth startups. Within this framework, universities actively support youth labor brigades such as Zhasyl El, compliance clubs Sanaly Urpaq, the public organization Kazakhstan Volunteer League, Enactus, and the police support squad Sert. These activities vividly demonstrate the commitment to the practical implementation of the "third mission of the university," focused on serving society and fostering the innovative potential of young people.

The development of students' civic engagement and their full inclusion in the

public life of the country are inextricably linked to the creation of a safe and supportive environment that fosters the growth of a healthy and socially responsible individual. In this context, special attention is given to preventing deviant behavior and developing a comprehensive system of psychological support in universities, which is an integral part of shaping an active and well-rounded citizen.

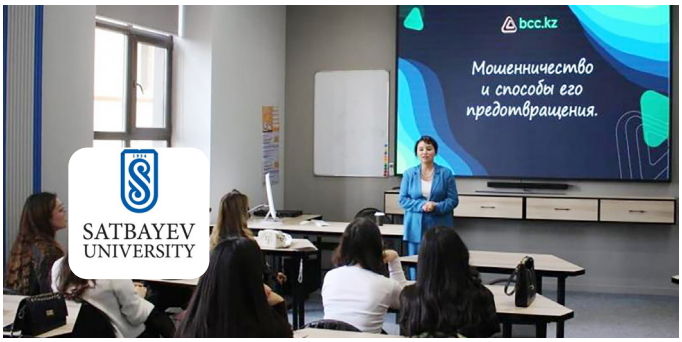
In order to prevent potential risks, manifestations of deviant behavior, and destructive situations among young people, educational institutions, including universities, are actively implementing measures to strengthen the work of psychological services. These services include qualified specialists, as well as the organization of seminars, discussion platforms, and individual consultations.

As of today, 70 universities have established fully functioning psychological services, which include 10 centers, 9 psychological assistance offices, as well as psychological support offices and clubs. In other universities, psychologists are staffed in the departments for social and educational work, ensuring universal access to qualified assistance. Call centers are also operating in universities to provide prompt responses to emerging issues. Special attention is given to strict adherence to discipline and daily routines in student dormitories, contributing to a safe and orderly environment.

To support this work, Methodological Guidelines for Organizing the Activities of Psychological Services in Higher and (or) Postgraduate Education Institutions were developed and approved (Order of the Minister of Science and Higher Education of September 29, 2023, No. 502) [57]. The guidelines outline measures aimed at supporting the personal and intellectual development of students, fostering self-education and self-development skills, and providing psychological assistance to ensure successful socialization in a rapidly evolving information society. According to the guidelines, universities are recommended to employ at least four psychologists within their services, and currently around **200 specialists** work in universities.

One of the important areas of university work is the prevention of such negative phenomena as gambling addiction, financial fraud, involvement in pyramid schemes, and uncollectible loans. Special emphasis is placed on improving students' financial literacy:

Implementation of educational courses:



The Ministry of Education has decided to introduce the mandatory course Financial Literacy into all university programs.

Development of specialized disciplines:

Within the framework of the project Qaryzsiz Qogam (Debt-Free Society), universities have developed and implemented disciplines such as Credit Risk Management, Personal Finance Management, Financial Planning and Budgeting, Financial Risk Management, and Social Entrepreneurship. These courses are designed to provide students with practical skills for responsible financial behavior. The fight against corruption and the promotion of academic integrity remain priority tasks in higher education.

Implementation of international standards:

Five universities have already introduced international anti-corruption standards, and other institutions are planning to obtain international certificat яion under the Anti-Corruption Management System.

Activities of the Academic Integrity League:

Seventeen leading universities of the country are united under the Academic Integrity League, which actively works to improve the quality of education through the promotion and implementation of the fundamental principles of honesty and integrity.

Operation of compliance services and student clubs:

All universities have established compliance services and ethics officers responsible for preventing corruption risks. Universities host anti-corruption student clubs Sanaly Urpaq, and during examination periods, the Clean Session campaign is regularly conducted to promote students' active civic engagement in combating corruption.

The Anti-Corruption Volunteering Project:

Students actively participate in the Anti-Corruption Volunteering Project, making a personal contribution to reducing corruption through public oversight.

Significant work is being carried out to prevent offenses among students, which is particularly relevant given the statistics of the Ministry of Internal Affairs (MIA), according to which 83% of young

offenders (21,735 out of 26,124) belong to the NEET category (not in education, employment, or training).

- **Comprehensive educational programs:** Within the framework of educational initiatives, universities regularly organize activities aimed at preventing offenses, drug abuse, and promoting a healthy lifestyle.
- **Interagency cooperation with the MIA:** A Memorandum of Cooperation has been signed with the Ministry of Internal Affairs of the Republic of Kazakhstan to jointly work on crime prevention, including drug abuse. Over the past three years, about 40 cases related to drug trafficking have been registered among students (Articles 296 and 297 of the Criminal Code of the Republic of Kazakhstan).
- **"EsBol" project and student cells:** Joint work is underway with the MIA and the public foundation Future Without Drugs ("EsBol") to establish student cells for addiction prevention among youth. To date, such cells have been opened in 8 regions, engaging more than 2,000 students, with plans to expand coverage to all regions.
- **Information campaigns:** Messages on criminal liability for drug trafficking are posted in students' personal accounts, on official university websites, and on social media. In addition, explanatory events are conducted with the participation of law enforcement representatives to raise awareness about responsibility for spreading prohibited content on social networks and messengers.
- **Large-scale preventive measures:** Over the past two years, universities have conducted more than 800 events dedicated to drug use prevention and the promotion of a healthy lifestyle.
- **Pilot youth survey project:** As part of the Comprehensive Plan to Combat Drug Addiction and Drug Trafficking for 2023–2025, a pilot project has been launched to conduct anonymous youth surveys regarding the use of psychoactive substances. At four universities (Al-Farabi Kazakh National University, Abai Kazakh National Pedagogical University, L.N. Gumilyov Eurasian National University, and Satbayev University), 100 students have already been surveyed, and the results have been submitted to the Ministry of Health of the Republic of Kazakhstan.
- **Access to the Coursera educational platform:** 95 universities have been granted access to the Coursera platform for 59,000 students. The platform offers courses on crime, violence, suicide, drug, and alcohol prevention, including topics such as The Addicted Brain, Drugs, Drug Use, Drug Policy and Health, Types of Conflict, and Suicide Prevention.
- **CADAP 7 joint project:** Within the framework of the CADAP 7 program funded by the European Union, a joint project on preventing drug distribution among students has been launched. The project's working group includes nine psychologists from eight universities.

The systemic implementation of all these measures at the university level contributes to the formation of a harmoniously developed and socially active youth, fully aligned with the strategic goals set out in the Concept for the Development of Higher Education and Science in the Republic of Kazakhstan. Active civic engagement of students, their participation in crime prevention projects, the fight against corruption, and the promotion of a healthy lifestyle are key factors ensuring the sustainable development of society.

8.4. Student Sports and a Healthy Lifestyle

The development of any society is inextricably linked to the health of its population; therefore, the formation of a harmoniously developed and active individual is a key condition for successfully addressing social, economic, cultural, scientific, and educational challenges. In this context, a healthy lifestyle is not merely a set of physical practices but a comprehensive worldview capable of building immunity not only against diseases but also against unlawful behavior and harmful addictions. For this reason, one of the central tasks of educational work within this program is the promotion of a culture of healthy living among students.

In line with this, the Ministry of Science and Higher Education of the Republic of Kazakhstan carries out comprehensive measures aimed at involving students in sports and promoting healthy lifestyles. These efforts extend to both national and international levels, including the organization and participation in major events such as the World Winter and Summer Universiades, the Universiades of the Republic of Kazakhstan, and the Student Sports League.

National competitions play an important role in popularizing sports among young people and identifying talented athletes. For example, from April to June 2023, the XII Summer Universiade of the Republic of Kazakhstan was held in Aktau, with 62 universities and more than 2,000 students taking part. The competitions featured 17 sports, including popular team games (basketball, volleyball, futsal) as well as individual disciplines (boxing, judo, athletics, chess) [58].

The Kazakhstani student team regularly represents the country at the global level, demonstrating a high level of preparation. At the 31st World Winter Universiade in Lake Placid (USA) in 2023, a delegation of 107 people, including 79 athletes, competed in 10 sports. The Kazakhstani team ranked 11th overall among 43 countries, winning 11 medals (3 gold, 4 silver, 4 bronze).

Similarly, at the 31st World Summer Universiade in Chengdu (China) in 2023, the Kazakhstani delegation included 116 participants, 90 of whom were athletes competing in 11 sports. The team ranked

20th out of 119 countries, earning 20 medals (2 gold, 7 silver, 11 bronze).

Since 1993, the Kazakhstani student team has actively participated in the World Summer and Winter Universiades, winning a total of 231 medals (56 gold, 79 silver, 96 bronze), which highlights its significant contribution to the international student sports movement.

Reference:
The International University Sports Federation (FISU) holds the World University Games – the Universiades – every two years, with university students aged 17 to 25 eligible to participate.университетов в возрасте от 17 до 25 лет.

In addition to world championships, Kazakhstan is actively developing regional sports cooperation. From November 5 to 10, 2023, the II Turkic Universiade was held in Turkistan. The competitions featured 7 sports and brought together 445 delegates from 6 member states of the Organization of Turkic States (Kazakhstan, Azerbaijan, Kyrgyzstan, Tьrkiye, Uzbekistan) as well as Hungary (as an observer).

The event contributed to strengthening sports and cultural ties among Turkic nations and expanded opportunities for students to gain competitive experience.

The systematic development of student sports within the country is reflected in a large-scale project – the Student Sports League, which has been held since 2021 across 7 sports (table tennis, kazakh kuresi, chess, toğızqumalaq, basketball, volleyball, futsal), covering a wide range of students.

This three-stage competition (intra-university, regional, and national stages) is a key element of the strategy to engage students in regular sports activities and identify talented athletes at all levels.

For instance, from May 26 to 31, 2024, Nazarbayev University hosted the final stage of this major sporting event, which brought together more than 750 students from 52 universities across 8 sports: table tennis, kazakh kuresi, chess, toğızqumalaq, basketball (men's and women's), swimming, kickboxing, and taekwondo.[62].

The regional stages of the League, held from March to May 2024, covered **6 divisions**:

- **Astana** (14 universities),
- **Almaty** (37 universities, including Almaty Region and Jetisu Region),
- **North-Central** (16 universities from Akmola, Karaganda, North Kazakhstan, and Kostanay regions),
- **Western** (12 universities from West Kazakhstan, Atyrau, Aktobe, and Mangystau regions),
- **Eastern** (11 universities from East Kazakhstan, Abai, Pavlodar, and

Ulytau regions),

- **Southern** (15 universities from Shymkent, Kyzylorda, Zhambyl, and Turkistan regions).

Winners of these regional stages qualified for the national finals, ensuring a high level of competition and fostering athletic growth.

The final stage of the Student Sports League showcased significant sporting achievements:

Swimming: 61 students from 14 universities competed across various styles and distances. The leaders were Nazarbayev University, M. Kozybayev North Kazakhstan University, and Al-Farabi Kazakh National University.

Kickboxing: 135 students from 25 teams took part, with Sh. Murtaza International Taraz Innovative Institute, Astana International University, and B. Beisenov Karaganda Academy of the Ministry of Internal Affairs of the Republic of Kazakhstan winning prizes.

Kazakh kuresi: Students from 26 universities competed across 10 weight categories, with winners including Khoja Akhmet Yassawi International Kazakh-Turkish University, Kazakh Academy of Sport and Tourism, and Kh. Dosmukhamedov Atyrau University.

Table tennis: 93 athletes participated. Among men's teams, the leaders were Academician A. Kuatbekov People's Friendship University, M. Utemisov West Kazakhstan University, and SDU. Among women, Shymkent University,

Kazakh National Women's Pedagogical University, and Shakarim University of Semey took the lead.

B Toğızqumalaq: Among men, the top places went to Abai Kazakh National Pedagogical University, L.N. Gumilyov Eurasian National University, and K. Zhubanov Aktobe Regional University. Among women, the winners were Al-Farabi Kazakh National University, Abai Kazakh National Pedagogical University, and A. Margulan Pavlodar Pedagogical University.

Chess: 83 students from 15 universities competed. Nazarbayev University won the men's category, while Al-Farabi Kazakh National University led among women. The Kazakhstan Chess Federation awarded cash prizes to the winners.

Basketball: 180 students participated, with the International Educational Corporation winning among men and Al-Farabi Kazakh National University among women.

Overall, creating favorable conditions for sports activities is a priority: in 104 civilian universities, there are 101 sports clubs and 721 sports sections (boxing, wrestling, volleyball, basketball, football, and others), engaging more than 177,263 students.

All civilian universities are equipped with the required sports facilities in line with regulations, which has made it possible to achieve a student participation rate in sports of over 50%. To further promote sports at universities, a wide range of events are regularly organized for both students and faculty, including Health Days, "Freshman" and faculty spartakiads, championships in mini-football, basketball, volleyball,

football, eco-cross races, sports festivals, track races dedicated to Victory Day, ski races, "Health Festival" and "Sports Day" campaigns, "Golden Autumn" and "Spring Cross" athletics events, "Presidential Mile" competitions, as well as various other tournaments and contests. These initiatives are aimed at strengthening youth health and developing sustainable habits of a healthy lifestyle, which is strategically important for the country's future development.

Commitment to the strategic vision of social development through strengthening the nation's health is embodied in the active development of student sports and the promotion of a healthy lifestyle in higher education institutions of Kazakhstan. The organization of multi-level competitions such as the Student Sports League, as well as participation in international Universiades, not only identifies and supports athletic talents but also lays the foundation for instilling lasting habits of physical activity among future generations. These initiatives, fully aligned with the objectives set out in conceptual documents on the development of education and physical culture in the Republic of Kazakhstan, are strategically vital for ensuring the harmonious development of individuals, their civic maturity, and their ability to contribute productively to the nation.

Further strengthening measures to promote sports and a healthy lifestyle among students will contribute not only to improving the quality of life of citizens but also to enhancing the overall social and economic potential of Kazakhstan.

CONCLUSIONS

The modern university in Kazakhstan plays a multifaceted role that goes beyond traditional academic education and includes civic education, the development of national identity, and social responsibility. The social mission of the university is implemented in several key areas:

Formation of national identity. Universities play a central role in strengthening the national consciousness of young people through comprehensive ideological and educational activities. The concept of the "working person" is being promoted, along with projects aimed at preserving cultural values, such as "Ұлы дала мұрагерлері" (Heirs of the Great Steppe), "Туған жер" (Native Land), and "The Sacred Geography of Kazakhstan". Special attention is given to the teachings of Abai Kunanbayuly on the concept of the "Perfect Human" (Толық адам), which serves as a foundation for nurturing a spiritually mature generation. Leading universities have established "Abai Centers" and the "Academy of Abai Studies," which conduct scientific research, develop methodological materials, and promote his legacy.

Civic engagement. A priority is the development of an active civic position and social responsibility among students. Universities actively involve students in self-governance bodies, academic councils, and other working groups, allowing them to directly influence academic life. To encourage such participation, an integrated social GPA system has been introduced to comprehensively assess students' involvement in community life and volunteer activities. The proportion of students engaged in civic activities and volunteering has reached 40%, with a target of 65% by 2029. Furthermore, a Student Ombudsman Institute has been established in all 20 regions to protect the rights and interests of students.

Inclusion and support for vulnerable groups. National education policy is aimed at ensuring equal access to learning. Positive dynamics are observed in the development of inclusive education: 72 out of 103 universities (70%) have created the necessary conditions. A total of 2,919 students with special educational needs (SEN) and 51,641 students from socially vulnerable groups are enrolled, accounting for 8.2% of the total student population, with the largest share represented by students from large families. Progress has been made in infrastructure adaptation, provision of psychological and pedagogical support, and the development of adapted programs. However, data show the need for further measures to expand access to master's and doctoral programs for students with SEN, to strengthen their employment opportunities (currently 30–40%), and to increase their participation in academic mobility programs.

Promotion of healthy lifestyles and prevention of destructive behavior. Universities are actively working to prevent such negative phenomena as gambling addiction, financial fraud, and drug abuse. Measures include strengthening psychological services (around 200 specialists across 70 universities), introducing a mandatory course on

"Financial Literacy," and collaborating with the Ministry of Internal Affairs (MIA) on crime and drug prevention. The promotion of a healthy lifestyle is one of the central goals of educational work, achieved through the organization and participation in Universiades and the Student Sports League. Participation of Kazakhstani students in international and national competitions, such as the Universiades, brings medals to the country and highlights the commitment to student sports and healthy living. More than 50% of students are engaged in sports activities, with 101 sports clubs and 721 sports sections operating across universities. These initiatives contribute to the holistic development of individuals and the strengthening of the nation's health.

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Авторы выражают искреннюю благодарность всем организациям, участвовавшим в подготовке данного доклада, а также сотрудникам Министерства науки и высшего образования Республики Казахстан за предоставленные материалы, поддержку и содействие в проведении аналитической работы.

Мы выражаем глубокую признательность каждому эксперту, сотрудникам вузов и исследовательских центров за их ценные комментарии, участие в обсуждениях и предоставление расширенных аналитических материалов. Их вклад в подготовку доклада, внимание к деталям и профессионализм позволили представить объективную и всестороннюю картину состояния высшего образования. Мы надеемся, что результат нашей совместной работы станет достоверным источником информации для общества.

Этот доклад стал возможным благодаря коллективному труду и стремлению к совершенствованию системы высшего образования и науки в Казахстане. Благодарим всех, кто внес свой вклад в его подготовку, и надеемся, что представленный материал будет способствовать дальнейшему развитию.