

**GUIDELINES ON THE
METHODOLOGY OF THE DUAL
TRAINING SYSTEM** in the context of designing
educational programs of higher education for
industrial automation and robotics in the Republic
of Kazakhstan 2020 - 2023



With the support of the
Erasmus+ Programme
of the European Union



КННЭУ

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1 About project

This project is implemented by partner institutions - EU partners (4), 4 state universities (4) and a private institution from Serbia (1).

In the Republic of Kazakhstan, with the organizational support of the National Office of the Erasmus+ program, the following educational institutions are implementing the project “Dual education for industrial automation and robotics in Kazakhstan”:

- Innovative University of Eurasia;
- West Kazakhstan Agrarian and Technical University named after Zhangir Khan;
- Kostanay University of Engineering and Economics named after M. Dulatov.

The interim results of the project, obtained by the results of 2020-2021, allowed us to formulate this guide on the methodology of the dual training system in the context of designing educational programs of higher education for industrial automation and robotics in the Republic of Kazakhstan.

Personnel policy is one of the key priorities of public administration. The level of professional training of personnel determines the effectiveness of programs for structural adjustment of the economy, expansion of production of goods and services, ensuring their competitiveness in domestic and foreign markets.

In the context of an ambitious state policy for the development of Kazakhstan's industry, the shortage of highly qualified engineering and technical personnel turned out to be one of the key difficulties preventing modern Kazakh industry from developing dynamically, and the territories of the Republic of Kazakhstan from systematically increasing their investment attractiveness.



The current system of training engineering and technical personnel in many regions was characterized as weakly reacting to the transformations taking place in the economy, having a high inertia of educational organizations in the field of introducing new production and educational technologies and not ensuring the adaptation of graduates in real production conditions.

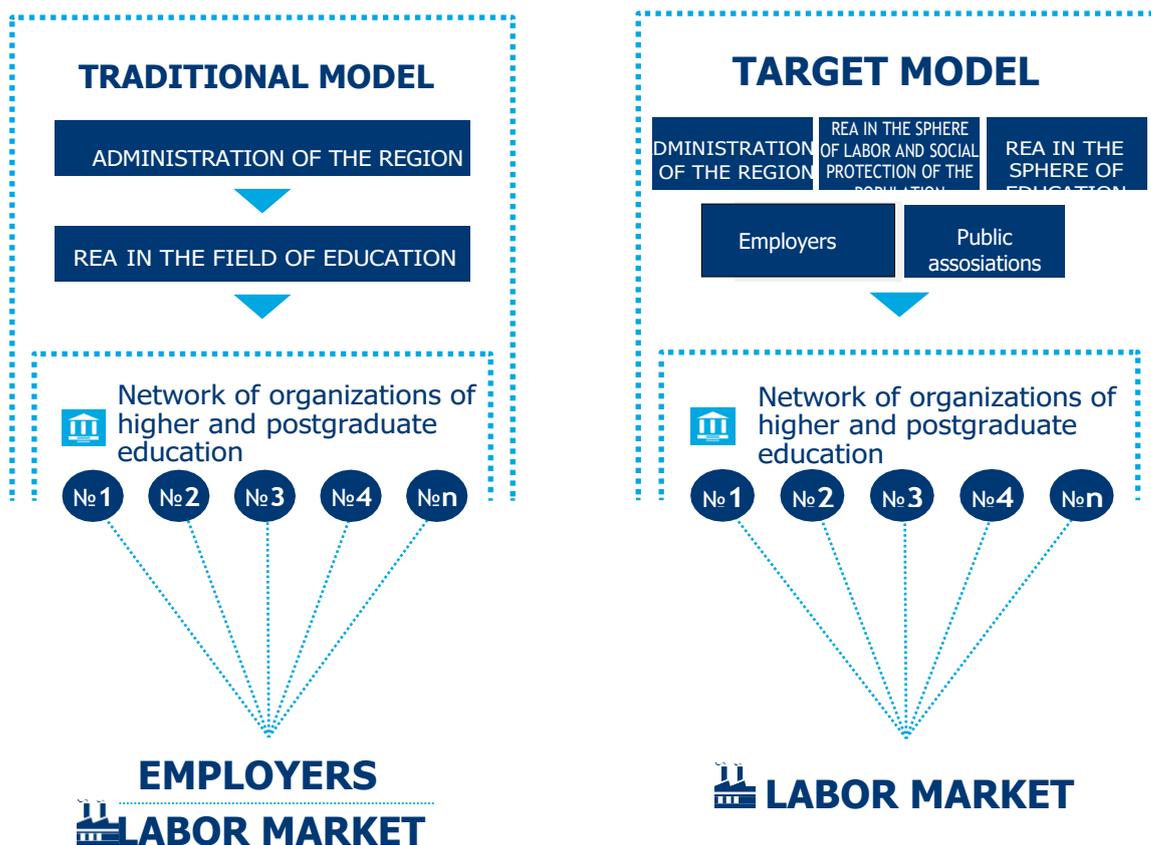
The interim results of the project have shown that the solution of these problems is in the sphere of public-private partnership of public authorities, employers, organizations of higher and postgraduate education in the field of systemic transformations, building a practice-oriented system of training highly qualified personnel from career guidance to the procedure for assessing professional competencies.

The main objective of the project: development, implementation, testing and validation of the bachelor's degree program in the field of industrial automation and robotics with the introduction of a dual training system at 3 universities in Kazakhstan: Kostanay University of Engineering and Economics named after M. Dulatov, Innovative University of Eurasia (Pavlodar) and West Kazakhstan Agrarian and Technical University named after Zhangir Khan.

Project objectives:

1. To promote the development and adjustment of curricula in accordance with the needs of industrial companies in the educational process of the dual training system.
2. Involve industry specialists to identify specific training needs and develop the content of practical classes within the framework of the dual training system.
3. Transfer and implement the best practices from EU countries that have many years of experience in dual education programs at universities, by creating the capacity for periodic and practical trainings by teachers and employees of the company.
4. Create tools and templates to facilitate the phased implementation of practical training in enterprises.
5. Demonstrate the advantages of the dual education system in the field of higher education for all interested parties by testing and evaluating adapted curricula, necessary tools and teaching materials.
6. Develop a methodology for the modification and reorganization of existing bachelor's degree curricula for implementation into a dual paradigm integrated in practice (in the context of Kazakhstan).
7. To ensure the continuous use of the results by offering a dual training system to other educational institutions and enterprises.
8. Disseminate the results of the project and encourage the creation of dual training programs for higher education in Kazakhstan.

The introduction of the dual training system will contribute to the creation of regional conditions to ensure the transition from the traditional to the target model of providing the region's economy with highly qualified engineering and technical personnel.



CHAPTER 1 METHODOLOGICAL FOUNDATIONS OF THE DUAL TRAINING SYSTEM

1.1 Goals and objectives of the implementation of the dual training system

THE MAIN PURPOSE OF THE DUAL TRAINING SYSTEM:

Ensuring compliance of professional competencies of students with the needs of the labor market, improving the quality of vocational training of students and strengthening the links of vocational training with production.

THE PURPOSE OF THE PROJECT:

Improving the system of dual training in the field of industrial automation and robotics in Kazakhstan, taking into account the real needs of the economy in qualified personnel to increase the investment attractiveness of the regions.

THE MAIN OBJECTIVES OF THE DUAL TRAINING SYSTEM:

- training of personnel in accordance with the needs of the labor market, dynamics and prospects of development of economic sectors;
- improving social partnership;
- changing and qualitative updating of the content and structure of educational programs taking into account the demands of industrial and innovative development of economic sectors;
- ensuring the participation of social partners in the organization of the educational process at the enterprise (organization), quality control and assessment of professional readiness;
- improving the level of personnel training through the dual training system;
- ensuring the interconnection, interpenetration and mutual influence of various systems (science and education, education and production), aimed at a qualitative change in the system of higher and postgraduate education;
- creating conditions for the transfer of professional experience to students in real production conditions with the possible acquisition of professional qualifications;
- assistance in the employment of university graduates at enterprises of various sectors of the economy.

EXPECTED RESULTS FROM THE IMPLEMENTATION OF THE DUAL TRAINING SYSTEM:

- Professional education focused on real production;
- Development of the personnel demand forecasting system;
- Increase in the level of education financing by enterprises;
- Variability of educational programs of higher education;
- Development of a system of independent assessment of the level of quality of training of engineering and technical personnel;
- Improving the level of professional training of engineering and technical personnel.

1.2 Main aspects of the dual training system

Essential characteristics of practice-oriented education that distinguish it from all other types of education:

- the source of goal-setting is the request of the economic sphere (which is considered as the core of "social practice", understood in a broad sense) in highly qualified personnel of a certain level;
- developed mechanisms of social partnership (involvement in the activities of higher and postgraduate education of representatives of the economic sphere - direct customers, consumers and beneficiaries of the results of practice-oriented education);
- the primacy in the educational process of practical forms of learning, focused primarily on the formation of specific, standard and standardized skills and abilities (within the framework of the implementation of specified professional functions);
- preferential use of standard and technological forms, methods and means of teaching in the educational process.

The dual education system implies the involvement of employers' organizations in the system of higher and postgraduate education as providers of educational services.

There are "narrow" and "wide" meanings of the concept of "dual education (training)" that have developed in the Republic of Kazakhstan.

In a narrow sense, **DUAL TRAINING** is a form of organization and implementation of the educational process, which implies theoretical training in an educational organization, and practical training in an employer's organization.

In addition to the dual training system, there are other forms of training used in the framework of practice-oriented vocational education both in Kazakhstan and abroad. This is the organization of practice at the workplace within the framework of an educational program; training at specially equipped workplaces in the structural units of higher and postgraduate education (in workshops, laboratories, training firms, landfills, resource centers, etc.).

Dual training in the narrow sense practically coincides with the form of organization of practice in the workplace within the framework of an educational program. This form, as a rule, implies the interaction of higher and postgraduate education with the employer, unaware of changes in the education system as a whole.

In a broad sense, **DUAL EDUCATION** is an infrastructural regional model that ensures the interaction of systems: forecasting personnel needs, professional self-determination, vocational education, assessment of professional competence, training and advanced training of teaching staff, including mentors at work. The relationship between the parties is regulated by a flexible, consensual and collegial management system. Each system influences the development of the other and one cannot exist without the other.

It is the integrity and at the same time the distribution of the functions of the participants that ensures the effectiveness of the dual training system.

Today, the system of dual training (education) is a promising direction in the training of specialists for the real sector of the economy with the participation of large businesses with high-tech production, focused on international quality standards, both products and personnel qualifications.

THE DUAL TRAINING SYSTEM IS EFFECTIVE WHEN PROVIDING THE FOLLOWING FACTORS:

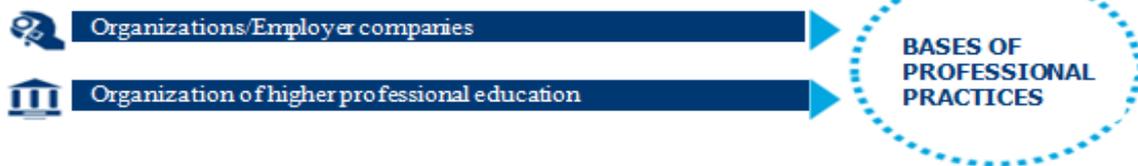
- **FIRSTLY**, the curricula are drawn up taking into account the proposals of employers. That is, students in classrooms study, first of all, what they will directly need at work, on the basis of which the degree they received during their studies at an educational institution will comply with the professional standards in force at the workplace. Employers, based on their needs for specialists who have not only a certain professional training, but also certain social and psychological qualities, form a specific order for the organization of higher and postgraduate education. Thus, the gap between theory and practice is bridged, and the company receives a specialist who is actually ready to perform his production functions and tasks.

- **SECONDLY**, the future specialist receives real professional knowledge, skills and competencies at the workplace based on effective technologies; gets the opportunity to practice at the workplace and perform work assignments. Thus, the future specialist is prepared to perform professional functions and is maximally motivated for production activities in the team.

- **THIRDLY**, being a part of the production team, the future specialist learns the norms of the corporate culture of the enterprise at which they will work.
- **FOURTH**, errors of personnel services in the selection of personnel are significantly reduced, since the long-term work of interns at the enterprise makes it possible to identify their strengths and weaknesses.
- **FIFTHLY**, the costs of the enterprise for personnel recruitment are significantly reduced, due to the fact that the vast majority of graduates of higher education institutions remain at the enterprise and there is no need to apply to recruitment agencies, employment services with applications for certain specialists.
- **SIXTH**, cooperation with the HPE organization within the framework of dual training makes it possible to organize a system of in-house training of the company's personnel within the framework of advanced training programs with the invitation of the most trained teachers from organizations of higher and postgraduate education.

DUAL TRAINING

The form of organization of the educational process
(practice at the enterprise, training at the university)



DUAL EDUCATION

Infrastructural and regional model that ensures the interaction of systems: personnel forecast, career guidance, planning and organization of the educational process and assessment of competencies.



1.3 Benefits for project participants



FOR BUSINESS

- Training of personnel for specific technological processes that exactly meet the requirements of the enterprise;
- Improving productivity, quality of services and products;
- Reduction of the terms of adaptation of graduates at enterprises;
- Achieving a greater return on invested capital in the medium term as a result of their educational efforts;
- Reducing the cost of additional teaching;
- Participation in the development of the EP.



FOR THE HIGHER AND POSTGRADUATE EDUCATION SYSTEM

- Improving the quality of higher education;
- Improving the competitiveness of the educational organization of HPE, increasing the number of applicants;
- Development of the material and technical base;
- High percentage of graduates' employment.



FOR FUTURE SPECIALISTS

- Mastering professional skills and competencies for work activity;
- Remuneration during the period of professional practice;
- Training in real production conditions;
- Identification with the training company and the chosen specialty;
- Guaranteed employment;
- Competitiveness in the labor market.

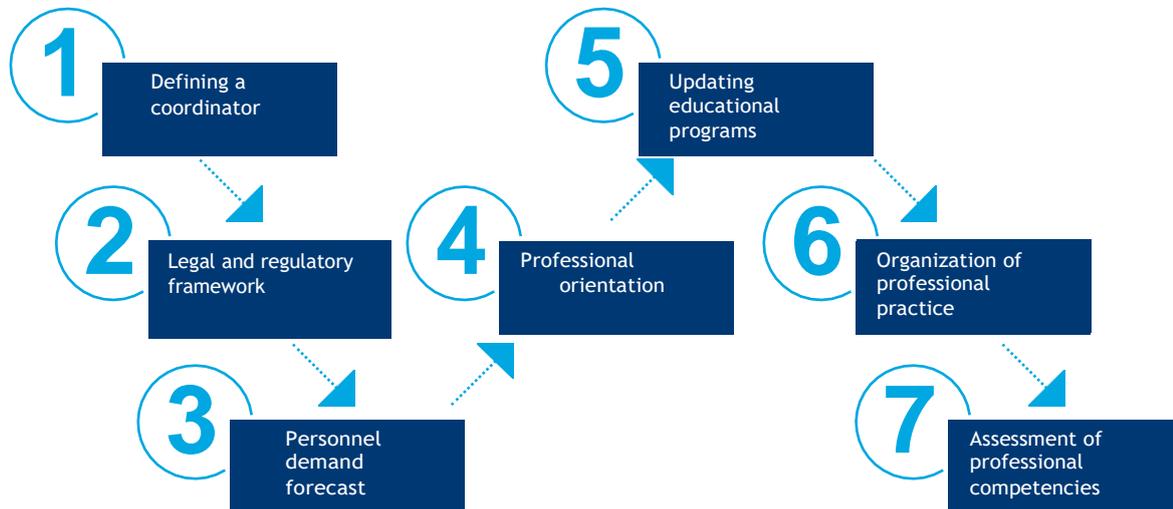


FOR THE REGION

- Ensuring a balance of supply and demand in the labor market;
- Increasing the investment attractiveness of the region;
- Effective management of the system of higher and postgraduate education and ensuring its quality.

1.4 Algorithm of implementation of the dual training system

GENERAL SCHEME OF THE IMPLEMENTATION OF THE DUAL TRAINING SYSTEM



STAGE 1

CHOOSING A COORDINATOR (OPERATOR)

The choice of the coordinator of the process of implementation of the dual training system in the region is a priority and one of the key tasks, since the coordinator ensures the successful implementation of the process as a whole in an operational mode and is responsible for the execution of its individual stages.

Based on the experience of implementing pilot projects in the regions, it can be concluded that the choice of the coordinator was carried out in 2 ways:

1. Determination of the coordinator by a directive appointment by the Head of the region or another authorized representative of the regional executive authorities.
2. Determination of the coordinator of the region based on the initiative of one of the organizations of the RK, an association of employers or a business association. An agreement is signed between the organization and the Head of the region of the RK, or another authorized representative of the regional executive authority. As a rule, in this case, the coordinator is appointed by an organization of the region of the RK, on its own initiative, promoting the dual education system in the region (for example, the Chamber of Commerce and Industry).

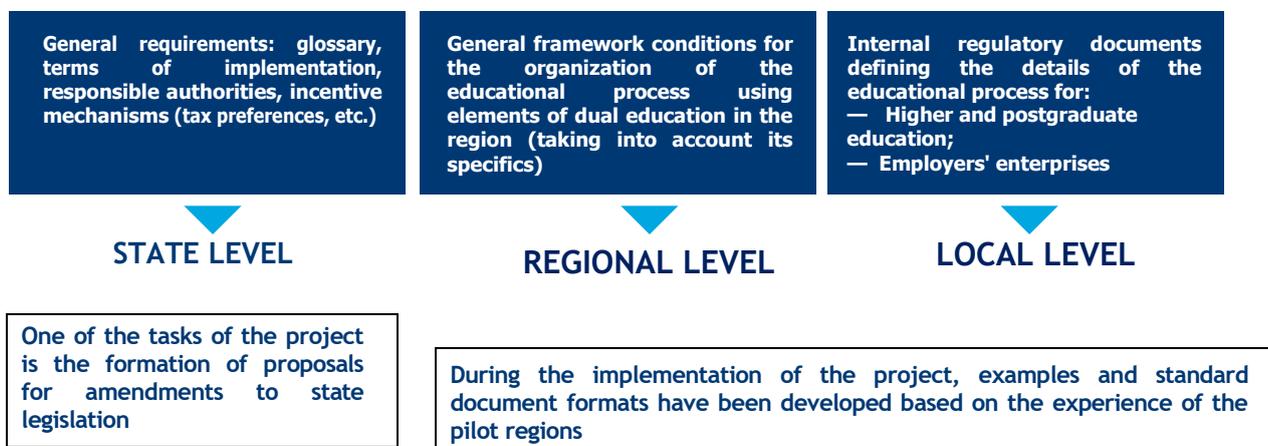
STAGE 2

REGULATORY AND LEGAL FORMALIZATION OF THE INTRODUCTION OF THE DUAL TRAINING SYSTEM

The regulatory and legal formalization of the introduction of the dual training system requires the preparation of an appropriate regulatory framework at all levels of management:

- STATE
- REGIONAL
- LOCAL

REGULATORY FRAMEWORK



In the Law of the RK "On Education" according to Article 1, paragraph 19-1: "(19-1) dual training is a form of training that combines training in an educational organization with mandatory periods of industrial training and professional practice at an enterprise (organization) with the provision of jobs and compensation to students with equal responsibility of the enterprise (organization), educational institution and student".

The consolidation of the terms "dual education (training)", the system of dual education, etc. at the state level leads to significant changes in the system of higher and postgraduate education, first of all, the principles of financing and infrastructure formation, changes in the degree of responsibility and rights of employers' organizations in the implementation of the educational process.

The experience of the pilot regions shows that the general conditions for the organization of the educational process using elements of dual training are determined by the regulatory legal acts of the RK.

STAGE 3

FORECAST OF INDUSTRY AND REGIONAL NEEDS

Qualitative forecasting of sectoral and regional needs is one of the key aspects of the successful functioning of the dual training (education) system, as it allows you to determine the focus of the training of specialists, coordinated with regional authorities, employers and the educational community, and subsequently correctly build appropriate training programs.

To ensure the effectiveness of the process of forecasting and planning the needs for the training of highly qualified personnel for the economy of the region, the following rules can be distinguished:

- Analysis of the current needs of key sectors of the economy in accordance with the technological model of forecasting the needs of the regional economy in personnel; taking into account data received from executive authorities, employers' associations, enterprises; taking into account the strategy of socio-economic development of the region, regional government programs.
- Orientation to strategic targets set at the state level, such as, for example, the development of science and technology in the RK; import substitution policy and food security; extensive use of the potential of existing technological platforms.
- The use of the data obtained to form a forecast of the development of the need for personnel in the medium and long term.

The main processes of forecasting industry and regional needs are:

- Analysis of the professional and qualification structure of personnel training in the region: analysis of the structure and composition of trained personnel, as well as the needs for qualifications in accordance with the development of the region's economy (benchmarks of industrial and economic development, promising investment projects, etc.).
- Analysis of employers' proposals for the formation of the forecast composition and structure

of the need for personnel.

- Development of a consolidated plan of admission control figures in the areas of training.



The names of the documents are formed based on the practices of the regions*

STAGE 4

PROFESSIONAL ORIENTATION

The career guidance system is aimed at creating the ground for the intersection of the interests of the individual, the higher education system, the employer, and the state. Career guidance is an effective tool for the timely professional self-determination of a person, in accordance with which it should be carried out as early as possible (for example, in Germany, active work on vocational guidance starts from grade 5)

Work on professional orientation is the most important factor providing a meaningful choice of specialties that are most promising from the point of view of the development of the region and ensuring a balance between the results of forecasting the need for personnel and the demand for training. In accordance with this, the vocational guidance system should be based on the results of the forecast of sectoral and regional needs, and the focus of career guidance activities should take into account the results of the forecast.

Career guidance activity involves the introduction of all the main participants into the process, including regional authorities, organizations of HPE, employers' organizations. The main tools of the vocational guidance system are:

- creation of a network of specialized consulting services;
- professional training;
- conducting mass career guidance events;
- conducting specialized competitions for students;
- informing about the state and prospects of the labor market.

STAGE 5

UPDATING EDUCATIONAL PROGRAMS

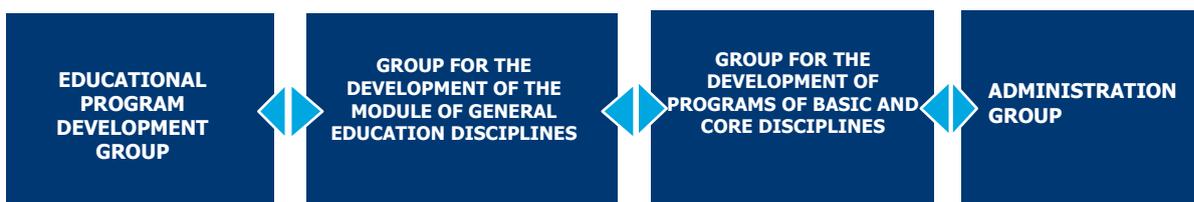
The educational programs of HE are based on the following principles:

- modular program construction;
- synchronization of theory and practice, interdisciplinary nature of building the content of modules;
- the team and iterative nature of the development of an educational program.

The updating of the educational program should be carried out jointly by representatives of employers' organizations and the organization of HPE. This form of cooperation between business and educational institutions is provided for in the RLA, according to which up to 30% of the content of the training program can be adapted to the requirements of employers. This approach allows you to build the training process of a potential employee taking into account the production specifics and business processes of a particular customer enterprise.

The development or updating of educational programs requires the creation of separate working groups that closely interact with each other.

AN IDEAL MODEL FOR ORGANIZING THE DEVELOPMENT OF AN EDUCATIONAL PROGRAM OF HIGHER EDUCATION



IMPLEMENTATION OF THE TEAM PRINCIPLE OF INTERACTION IN THE DEVELOPMENT OF THE EDUCATIONAL PROGRAM OF HIGHER EDUCATION

It is important to follow the sequence of steps of the algorithm: from determining the results of the development of the educational program to the evaluation procedures and evaluation tools, only then - to the formation of the actual content and structure of the program. Understanding the goals (results) and ways to check them makes it possible to build a program in the most optimal way. At the same time, the formation of the program structure (composition of basic and core disciplines) and its content is carried out on the principle of "from the reverse": first, the types of work (practices) that are part of the modules are determined, then the composition and content of the modules, and then the composition and content of the disciplines. The content of the professional module should ensure the principle of synchronization of theory and practice, and the content of BD and MD should "support", prepare for the development of modules. In the process of forming the content of the programs of professional modules and disciplines, there is a redistribution of educational material: special and professionally significant is included in the modules; general professional issues are covered in the content of the disciplines. It is important to understand that the content of the EP should be aimed at achieving the learning goals - the development of professional and general competencies that determine the level of competencies of graduates.

Compliance with the algorithm makes it possible, in the process of developing an educational program, together with the working group, to discuss the conditions for the implementation of the program, to allocate areas of responsibility for the implementation of individual elements of the program, which leads to a reasonable and expedient construction of the curriculum and the educational process.

Priority in the construction of an educational program using elements of the dual training system is the achievement by graduates of the level of competence required by the employer.

This is the goal of interaction between the parties, for which, taking into account the specifics of production, the necessary teaching staff (including employees of enterprises), equipment, infrastructure for conducting practices are determined.

The general algorithm for updating the educational program consists of the following steps:

1. The schedule of the educational process, the curriculum and the content of its constituent disciplines and professional modules.

2. Creation of a joint working group consisting of representatives of employer enterprises and representatives of HPE organizations.

3. Comparative analysis of national and industry standards of enterprises - employers with EP OHPE, identification of differences, bringing EP into compliance.

4. Development of procedures and tools for evaluating learning outcomes in the educational program.

5. Development of the structure and content of the program that meets the requirements of the SMSE of the RK, professional standards and requirements of employers' organizations.

6. Development of a curriculum and schedule of the educational process synchronized with the activities of employers and their opportunities to organize the practice of students on their own site or with the involvement of their employees.

7. Examination of the educational program with the participation of all interested parties and the possibility of involving graduates of the organization in the examination, since they reflect the opinion of direct consumers of educational services.

Approaches to the conduct of the educational process are changing. It is based on the features of the business process of the employer's organization.

The business process includes all the activities necessary to complete training tasks. The business process involves accepting an order, planning, delegating tasks, performing your own scope of work, documenting the level of quality and consumption of materials, as well as transferring the finished product to the customer.

Conducting such a process is the ability to perform (plan, execute, control) a specific task typical for this specialty, taking into account organizational and economic conditions. A situation is created for the student in which knowledge, skills and abilities are used and developed in the new process of completing work assignments.

The role of a teacher, a master of industrial training, a mentor at work implies not only the transfer of information. They act as a "coach", consultant and contact person to discuss professional and personal issues. Their main task is structuring, preparation and analysis of the educational process. Tasks should be prepared for students, which are compiled taking into account the material they have passed, as well as the necessary equipment and consumables are provided. Since students will have to learn how to get information on their own, it is necessary to conduct conversations with them, in which the material covered and its use in practice are discussed.

If planning errors are detected, it is necessary to point them out with the help of leading questions. An important part of dual training is the demonstration of ways to perform operations that are new to the student, and then control and perform. After completing the task, it is necessary to conduct a conversation with students on the analysis of the results of the work done. Students are invited to report on the difficulties they had to face and what they will do differently in the future. In parallel, the "weak points" in the training of the student are revealed. In the future, during the continuous process of improving the student's skills and abilities, these points should be paid special attention to using the recommended methods.

Methods based on the integration of ideas and principles of labor science and professional pedagogy: the foundation of practical work is an intellectually (meaningfully) performed work that allows you to purposefully manage the structure of productive action plans (knowledge is the basis for skills).

The main purpose of the dual training system is the independent fulfillment of professional tasks after graduation. In this regard, the whole process of dual training is aimed at ensuring that graduates can plan, perform and evaluate their professional activities. The objectives of the dual training program and the selection of content are subordinated to the interests of the educational program and are closely related to it. Didactic principles constitute an employment-oriented learning

concept. It can be implemented by different methods, but the main principle is orientation to action in the conditions of professional activity (formation of the "competence of action"). Competence of action can be acquired only through activity.

STAGE 6

ORGANIZATION OF PROFESSIONAL PRACTICE

Before students get to the production sites (especially in areas of high-tech and hazardous production processes), preliminary training should be organized in a simulator classroom, where students on simulation simulators will receive appropriate training.

Professional practice is organized in the production units of the enterprise. The company, while students are in production, provides them with training tools and consumables.

A mentor is assigned to each student - the most qualified specialist of the enterprise, who has undergone pedagogical training and carries out:

- transfer of personal professional experience;
- formation of general and professional competencies, training in the most rational methods of work;
- mobile adjustment of students' professional competencies;
- ensuring optimal use of time and resources;
- increasing the motivation of students to establish long-term employment relationships with the company;
- Introducing students to the corporate culture of the enterprise.

The mentor is the direct organizer of industrial training and is personally responsible for the quality of the preparation of the program. When implementing dual training programs, the mentor uses forms and methods of training that are as close as possible to production activities. The result of dual training at the enterprise depends on the qualifications, professionalism and motivation of the mentor.

Mentoring, as one of the key elements of industrial practice, should be appropriately provided with mechanisms of motivation and stimulation of this activity.

On-the-job training is carried out in accordance with the curriculum, the schedule of the educational process and the academic calendar.

STAGE 7

ASSESSMENT OF PROFESSIONAL COMPETENCIES

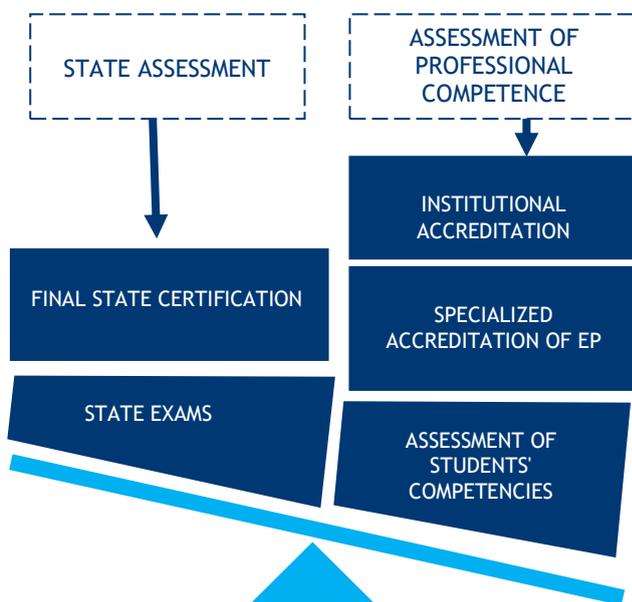
The process-outcome approach is the basis for ensuring the quality of design and implementation of educational programs implemented using dual training. At the same time, specialized accreditation of educational programs becomes a tool for ensuring the quality of the process (conditions of implementation), and the result is an assessment of professional competencies. The quality of the assessment is determined by the impartiality of experts and the objectivity of indicators and criteria for evaluating the result.

Assessment of professional competencies - confirmation of compliance of the applicant's competencies with the provisions of professional standards, with confirmation of the certificate of professional competence.



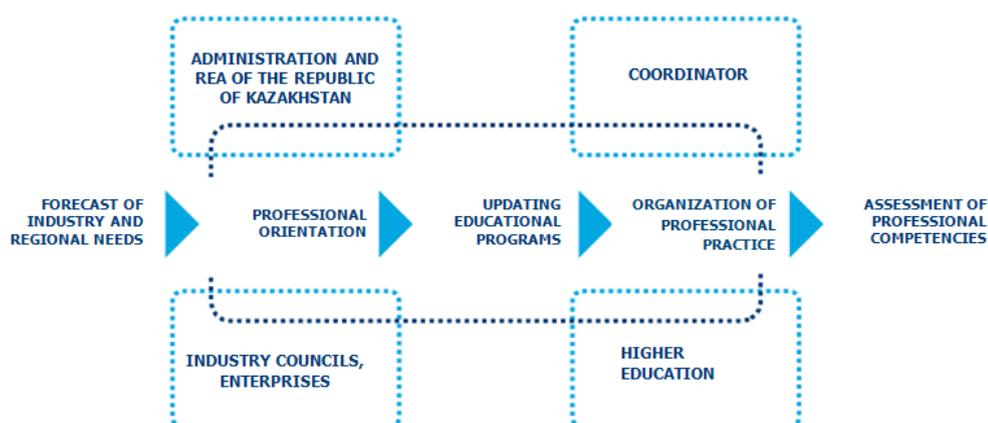
THE ASSESSMENT CAN BE CARRIED OUT BY:

- Development of centers and bodies for the accreditation of educational programs, assessment of professional competencies, including the qualifications of teachers and mentors.
- Development of the WorldSkills Kazakhstan Movement in the region and other best world practices of the professional competence assessment system.



Organizational model of the dual training system

Main participants of the project for the implementation of the dual training system



ADMINISTRATION OF THE REPUBLIC OF KAZAKHSTAN AND REGIONAL EXECUTIVE AUTHORITIES

The Administration of the Republic of Kazakhstan and regional executive authorities play a key role in the implementation of the dual training system, which consists in promoting the project, preparing the necessary regulatory and infrastructure base.

Areas of activity of the administration of regional executive authorities for the organization of the dual training system:

- Defining a process coordinator.
- Development and approval of the regulatory framework.
- Promoting the development of personnel training infrastructure.
- Planning and control of measures for the implementation of the dual education system in the region.

COORDINATOR

The project coordinator carries out operational planning and control of the implementation of the dual training system in the region, accompanies all key activities of the project. Based on the experience of implementing pilot projects, the role of coordinator, depending on the specifics of the region, can be assigned to various participants: regional executive authorities, the Chamber of Commerce and Industry of the region.

Areas of activity of the coordinator for the organization of dual training:

- Operational control of the progress of the implementation of the process and initiation of necessary changes and decisions (with their submission for joint discussions with the participants in the process).
- Formation of a consolidated order for training personnel for the economy of the region.
- Coordination of career guidance and updating of educational programs.
- Coordination of procedures for assessing the quality of education: assessment of professional competencies, accreditation of educational programs.

EMPLOYERS

Employers are customers for training in accordance with their own needs and in the medium term.

Areas of activity of employers for the organization of a dual training system:

- Determining the needs of the company at the moment and in the future (both near and far) employees.

- Participation in the development of a model of the educational process based on the principles of dual training, the specifics of the enterprise and the organization of HPE, including the development of practical recommendations for the inclusion in the syllabuses of the educational organization of sections that reveal the theoretical foundations of real production or technological processes.

- Development of social support measures for students, remuneration and incentives for students.

- Together with the employees of the organization, ensuring the development of the mentoring system at the enterprise, including the selection of candidates for mentors, the organization of their training.

- Together with staff and mentors of OHPE, determination of personal educational trajectories of trainee - trainees and development of criteria for assessing the level of quality of graduates' education, materials for the production exam.

INDUSTRY TIPS

An important role in the model of joint activity of the business community, educational organizations and authorities for the training of highly qualified personnel is played by employers' associations and business associations, including industry councils of employers, which consolidate the common interests of the entire business community.

Areas of activity of branch councils for the organization of dual training (education):

- Determination of the requirements for the qualification of personnel and the directions of their training.

- Formation of an agreed order for the training of specialists in the industry.

- Assessment of the quality of training of highly qualified personnel in the region.

ORGANIZATION OF HIGHER AND POSTGRADUATE EDUCATION

Organizations of HPE are the executors of the order for the training of personnel of higher education.

Areas of activity for the organization of dual training:

- Organizing and conducting career guidance events at the regional level, events jointly with employers.

- Design of a dual training system (creation of a joint material, technical and production base for the organization of dual training; development of educational programs together with representatives of the enterprise).

- Conclusion of an agreement on the joint implementation of educational programs with the enterprise; assignment of curators to the dual training group; development of criteria and selection of students in the dual training group; conclusion of an agreement.

- Organization of intermediate quality control procedures for the implementation of dual training programs, including jointly with mentors and masters of industrial training, development of mechanisms and tools for intermediate quality control of the implementation of dual training programs.

- Organization of the final state certification of students, including together with the management of the enterprise and mentors, development of criteria for assessing the level of quality of education of graduates, materials for the production exam.

- Informing graduates of the HPE organization about the possible passage of the professional competence assessment procedure.

- Ensuring monitoring of graduates' employment for 3 years.

CHAPTER 2 DESIGN OF EDUCATIONAL PROGRAMS OF HIGHER EDUCATION WITH CREDIT TRAINING TECHNOLOGY FOR INDUSTRIAL AUTOMATION AND ROBOTICS IN THE REPUBLIC OF KAZAKHSTAN

2.1 Theoretical aspects of designing educational programs of higher education with credit technology training for industrial automation and robotics in Kazakhstan

2.1.1 Analysis of theoretical aspects of designing educational programs of higher education with credit technology training

Designing the content of education refers to the field of educational design.

The range of subjects of designing the content of education is determined by the situation of interested persons (institutions), carriers of educational needs or a social order for a certain level of education. This circle should include specialists in the subject area of building of EP, researchers, methodologists, students, employers, administrative workers.

Designing educational programs of higher education in terms of its content (determining the competencies of specialists and learning outcomes necessary for the development of these competencies, the formation of program modules for the planned learning outcomes, the distribution of credits for all elements of the program) require true teamwork of all members of the teaching staff providing this educational program. When implementing educational programs focused on achieving the planned learning outcomes, teachers involved in the implementation of various modules and disciplines share responsibility for creating development opportunities stated in the program of general and professional competencies of specialists.

The interdisciplinary and modular nature of modern educational programs of higher education determines the need for a team approach to the design process. In other words, it is advisable that a specific educational program, subordinated to a common goal and focused on achieving common overall results, but at the same time consisting of separate modules, is designed by a development team.

The team of developers of the educational program of higher education solves the following tasks:

- carries out joint determination of the goals and expected results of the educational program, as well as the qualification characteristics of its graduate;
- defines the organizational and content structure of the modules of the educational program, including the "invariant" and "variable" parts;
- selects and designs the forms of performance certification common to the program;
- defines educational technologies and programs, as well as types of independent work of students;
- develops a general logic for the construction of educational and methodological material (both for classroom and extracurricular work).

2.1.2 Analysis of the level-based construction of educational programs of higher education with credit technology of training

The educational program of higher education is a complex of the main characteristics of education (volume, content, planned results), organizational and pedagogical conditions, forms of certification, which is presented in the form of a general characteristic of the educational program, curriculum, schedule of the educational process, work programs of disciplines, modules, practice programs, evaluation tools, methodological materials, other components included in the educational program by the decision of the organization.

In relation to educational programs of higher education, a model of design levels consisting of conceptual, substantive, technological and procedural levels is used as a structure.

Each level has different goals and objectives, the combination of which will make it possible to design EP of higher education in accordance with socio-economic goals, objectives, and needs of the

region and the area of implementation of EP.

The conceptual level ("program apparatus") involves the creation of a concept of an educational program of higher education or its predictive model representation. The EP creates a methodological basis for the development and implementation of professional training of specialists.

The content level ("program content") involves the development of content that defines the features of the educational program of higher education and the conditions for its implementation.

The technological level ("program conditions") allows us to present an algorithmic description of the method of action in a given context, that is, the choice of technologies that most effectively form the key competencies of a particular EP of higher education.

Procedural level ("program implementation") brings EP of higher education into a real process involving the receipt of final results (formed competencies of specialists or learning outcomes) and involving the definition of didactic tools, software products, etc.

In the context of the implementation of the competence approach, the structure of the educational program of higher education in OHPE should be uniform for the EP of various specialists; it should be based on the procedural and holistic principle of construction.

2.1.3 Analysis of the modular construction of educational programs of higher education with credit technology training

Due to the shift in emphasis towards training specialists in the direction of practical orientation, the design of curricula has become relevant, as well as the organization of the educational process based on the introduction of modular construction.

The new paradigm of the educational process in the OHPE leads to a radical change in the structure of the educational process. The most popular "change" was the development of modular curricula.

While studying the practice of preparing modular curricula, we came across a different approach to their construction. In most existing curricula, cycles are simply "mechanically" replaced with modules, while the essence of the educational process does not change.

To date, the concept of "module in education" has different meanings and different interpretations (discipline, complex of disciplines, part of discipline, complex of information material on the subject area).

At the same time, the key properties (or features) of the module are defined, which include:

- logical completeness and, as a consequence, relative isolation and clear focus of the module content on the result of training specialists;
- interchangeability: according to the modular principle, it is advisable to make up an academic discipline and an educational program from an invariant part (modules for compulsory study) and variable, replaceable modules. They can vary the depth and focus of training specialists, promptly responding to the needs of employers and the labor market.
- flexibility and freedom of choice: the module should be built in such a way as to provide the student with "maximum" opportunities to build their individual learning trajectory.

The module in the ECTS system is a relatively independent (completed in terms of goals and results) structural element of the program, which has clearly formulated the results of training specialists and adequate evaluation criteria.

The labor intensity of the module, expressed in credits, should be equal to the specified number of credits. Ideally, when designing educational programs of higher education, it is necessary to strive to build educational programs consisting of equal modules.

The modular system of the educational process organization is aimed at optimizing the workload of specialists, increasing the time for independent work in order to develop self-learning skills, maintaining the student in an "active state" during the entire period of studying the discipline by introducing current and intermediate forms of control.

Advantages of modular organization of the educational process:

- creating conditions for inviting external specialists;
- ensuring the mobility of students;
- freeing up "extra-modular" time for teachers;
- freeing up the time allotted in the traditional system for the session period;
- reducing the number of reporting forms;
- updating the content of education;
- optimization of the ratio of classroom and extracurricular work of students;
- optimization of educational and methodological support;

- strengthening interdisciplinary integration between disciplines/courses;
- using the developed modules in the professional development system.

The modular system of building the educational process is carried out in order to:

- exceptions to the "small-scale" curriculum, fragmentation of disciplines;
- combining disciplines working on one competence or on a group of related competencies into

large educational modules;

- improving the competence-based approach to the organization of the educational process;
- conducting modules within large disciplines by different teachers;
- activating the work of the teaching staff and students to update and improve the content, methods and technologies of teaching.

The basic principles of the modular organization of the educational process are the following:

- compactness (formation of a meaningful block of several disciplines for a certain period);
- intensification of the educational process, including the independent work of students due to a more rational organization and constant monitoring of learning outcomes;
- regularity and objectivity of evaluation of the results of the work of students and teachers;
- formation of the content of the educational material as a complete block, in order to construct an educational program from individual modules.

The «Tuning» methodology offers the following typology of educational modules:

- the main modules defining the "core" of the educational program of higher education;
- supporting modules (mastering these modules is necessary for mastering the main modules);
- transferable modules (translating theory into practice);
- non-core (optional (minor), optional modules).

As a recommendation, we offer the following content of the training module:

- precisely formulated educational goal;
- formulated learning outcomes in the module (a set of competencies, knowledge, skills and abilities, the formation of which is aimed at the module);
- information section - structured theoretical material, teaching aids or simulators for practical training, training computer programs and databases;
- executive section - packages of typical, complex and situational tasks, exercises and tasks with decision algorithms;
- the controlling section is a bank of control tasks corresponding to the goals set by this module, containing input and output control theoretical tests, special tasks of varying degrees of complexity, as well as methodological instructions for conducting control.

Proceeding from the above, it should be noted that the modular construction of the educational program of higher education will allow expanding the "field" of educational services provided by OHPE not only in terms of the content of the EP, but also in the technology of organizing the educational process for the training of specialists.

2.2 Stages of designing educational programs of higher education with credit training technology for industrial automation and robotics in Kazakhstan.

2.2.1 Analysis of the diagnostic stage of the development of the educational program of higher education

The first stage of the development of the educational program of higher education consists of 2 levels:

- monitoring of educational services;
- determination of the profile orientation of the program.

Today, the implementation of the educational program (EP) of higher education is an educational service, therefore, the determining factor for the design of the educational program should be not only the requirements of the state mandatory standard of education (SMSE), but also certain "subject" knowledge and skills, formulated by the future employer, necessary for the effective implementation of the formed competencies for industrial automation and robotics in the RK.

Potential consumers are now choosing higher education programs more pragmatically. Today, the choice is made from the point of view of the price ratio, the level of quality and the range of

knowledge, the applicability of the acquired competencies in practice and, thereby, increasing the competitiveness of the graduate in the labor market. The knowledge, skills and abilities demanded by practice and the innovative economy should be transformed into a new quality of education, supplemented by the development of students' abilities, the formation of a modern structure of values and readiness for various changes in the situation in professional activity.

The employer is an equal member of the team implementing the educational program of higher education. Employers, along with professional knowledge and skills, today appreciate new abilities related to oral and written communication, communication and teamwork, creativity, the ability to anticipate and put events in a broader context, resourcefulness, the ability to constantly learn and adapt to changes, be responsible and organized. At the same time, the skills of a systematic approach, high legal literacy, innovative type of thinking, knowledge of modern information technologies, and, of course, thorough training in the subject area is most in demand.

According to the "Tuning" methodology, a prerequisite for designing an educational program of higher education is to determine the demand for the program by students and society.

Determining demand requires careful and objective consideration of factors such as labor market dynamics, forecasts of the development of the subject area and the development of technology. In order to determine the relevance of the educational program of higher education, it is necessary to consult with all interested parties. These consultations should be extended to professionals in this subject area: professional associations and specific employers. To obtain the necessary information, "Tuning" has developed tools (questionnaires, special programs for processing and analyzing the information received), which allows conducting research on the importance of general and professional competencies. As a result of the surveys, national and international key guidelines are formed for the design of educational programs of higher education in the subject areas.

Based on these positions, when designing an EP of higher education at this diagnostic stage, such a level as determining the profile orientation of the program becomes "system-forming" in the conceptual context. When analyzing the existing requirements of the SMSE and the customer, a difficult situation arises in which it is necessary to systematize, generalize and interpret the information obtained in relation to the conditions for the implementation of the future EP and the educational process as a whole.

The profile orientation is provided by the "specifics" of the EP of higher education in terms of designing the results of its development, content and activity model.

The orientation of the educational program of higher education is established by the OHPE as follows:

- the orientation of the EP of higher education concretizes the orientation of the program on the fields of knowledge and (or) activities within the training area or corresponds to the training area as a whole;
- the orientation of the EP of higher education is determined by the specialization chosen by the OHPE;
- the orientation of the EP of the OHPE is specified by the orientation of the program on the fields of knowledge and (or) activities within the specialty or corresponds to the specialty as a whole.

Thus, the first stage of designing an educational program of higher education is crucial not only for building the content of the educational program, its structuring, but also for building an individual trajectory of each student, taking into account their capabilities, personality orientation and interest.

2.2.2 Analysis of the technological (content) stage of designing the educational program of higher education.

The next stage in the design of the educational program of higher education is distinguished as technological or content, including the following levels:

- definition of the purpose, mission of the educational program of higher education;
- determination of the conditions for the implementation of the educational program of higher education;

- formation of the final results of mastering the educational program of higher education (competencies and learning outcomes);
- development of the content of the educational program of higher education according to the chosen structure.

2.2.2.1 Definition of the purpose and mission of the educational program

The goals of the educational program of higher education are consciously defined, expected results. The goal can be interpreted as a description of a set of intellectual, moral, personal qualities and behavioral skills, as well as professional training and experience that should be acquired as a result of education.

The purpose of the EP of higher education is a specific description of the program for the development of the student by educational means, a description of the system of knowledge, skills and competencies that the student should master according to the results of mastering the EP as a future specialist.

At the same time, a well-developed and well-formed mission of the educational program of higher education is an important element of effective management of the educational process.

The mission includes common values and principles of building the educational process; the definition of activities that serve to meet specific needs, service selected market segments; requirements and interests of stakeholders (employers). The mission of the EP should be conceptual, at the same time be aimed at the implementation of the regional functions of the "consumers" of the region, being the most important and main part of the activities of all participants in the educational process in the organization of higher and postgraduate education.

In the course of designing an EP of higher education, the goals should be formulated in a language that allows predicting the content and level of education (professional competence) of specialists. In accordance with this, the procedure for designing goals should include categorical analysis and work with such concepts as "education", "training", "education", and "competence". Depending on their interpretation, the content of educational goals is carried out.

For a more visual representation of the design of the goals and objectives of the educational program of higher education, the researchers designate the following scheme, reflecting the principle of integrity of the construction of the educational program:



The system of goals of the educational program of higher education

2.2.2.2 Determination of the conditions for the implementation of the educational program of higher education

One of the requirements of the state mandatory standard of education is the requirements for

the conditions for the implementation of basic educational programs of higher education, which establish positions that are strictly subject to implementation. These requirements include personnel, financial, logistical and other. Also, these requirements define:

- the maximum amount of training load of students;
- maximum volume of classroom training sessions;
- total amount of vacation time;
- rights and obligations of students;
- conditions for the organization and conduct of professional practices, as well as final certification.

The structure of the educational program of higher education determines the list of disciplines and types of educational work of students, combined into the following cycles of disciplines:

- general education disciplines (GED);
- basic disciplines (BD);
- core disciplines (CD);
- professional practice (PP);
- disciplines, determined by the educational organization, taking into account the requirements of employers;
- exams (E);
- consultations (C);

The content of educational curricula of higher education, depending on the level, provides:

- the study of integrated courses in general education disciplines, which are the basis for the successful development of core disciplines, as well as the passage of professional practice for the acquisition and consolidation of skills and abilities;
- core disciplines; implementation of practical classes in the core disciplines; passage of professional practice for the acquisition and consolidation of profiling skills and abilities;
- study of integrated educational programs of higher education with educational programs of first-second courses, including general education disciplines studied in accordance with the object of professional activity; core disciplines, that form the basis of professional competence; implementation of practical classes in basic and core disciplines with the passage of professional practice.

The content of educational programs should:

- reflect modern achievements in the field of technology and production by economic sectors;
- take into account the norms of the organization of the educational process according to the credit technology of education;
- include the necessary competencies of specialists of the appropriate level;
- provide for the possibility of using modular learning technology.

The content of the disciplines is determined in accordance with the educational curriculum for each OHPE.

When developing and implementing an educational program of higher education, organizations of higher and postgraduate education have the right to:

- change the amount of study time allocated to the development of educational material for cycles and for disciplines included in cycles while maintaining the total amount of study time;
- choose different learning technologies, forms, methods of organization and control of the educational process that involve practice-oriented learning; the main results of their development are the development of general and the formation of professional competencies.

Educational programs of higher education include, along with compulsory disciplines and elective disciplines. These disciplines are aimed at ensuring the individual abilities and requests of students.

Educational programs aimed at vocational training include:

- study of general education and core disciplines;
- implementation of practical classes in the core disciplines;

- passage of professional practice.

The content of PP programs is determined in accordance with EP and the SMSE of the RK.

This requirement can be provided only under the condition of an almost "radical" change in the educational process of training a modern specialist.

2.2.2.3 Formation of the final results of the development of the educational program of higher education.

One of the most complex and well-organized stages of designing an EP of higher education is the formulation of the final results of its development, including the learning outcomes that make up the competencies formulated by the OHPE. The orientation of educational programs developed and implemented in the OHPE to the final practical result is due precisely to the introduction of a competency-based approach and the conditions for its implementation in the system of higher and postgraduate education.

Based on the analysis of the existing concepts of "competence", we can confidently say that there is no unambiguous definition. In the most general context of normative and methodological documents, competence is considered as the ability to integrate knowledge, skills, and their use in conditions of rapidly changing requirements of the external environment.

At the moment, research and projects in the field of higher education often do not represent a comprehensive methodology or tools for designing, developing, implementing and evaluating both the competencies themselves and educational programs based on a competence-based approach. However, such a comprehensive methodology should be the most important element necessary for decision-making.

The «Tuning» methodology recommends that, when designing educational programs of higher education, a team of teaching methodologists "work out" each competence of a specialist declared in the program from the point of view of possible mechanisms for its development in a student and monitoring (evaluating) the level of its achievement at different stages of the educational program implementation.

The forms of representation of each competence through the possible levels of its development in the student with the indication of indicators (learning outcomes) and descriptors corresponding to this level (indicators of success in achieving learning outcomes) can be very different (tables, passports, matrices, text descriptions).

It is important that the competence of the student, "worked out" at the design stage of the educational program and realized by the staff of teachers, forms the basis for the formation of working programs of modules (disciplines, practices) that make up the program for the selection and implementation of educational technologies and evaluation tools.

As a result of the implementation of the competence approach in the system of higher and postgraduate education, it became necessary to specify the content of the competencies stated in the educational program, since most had a broad and sometimes "blurred formulation", thereby leading to a discrepancy in the essence and meaning of the content of training. Therefore, the concepts of "learning outcomes" were introduced into practice.

The results of training specialists have become structural units of competencies, and the totality of "competencies" and "learning outcomes" represent, to date, the "results of mastering the EP".

The results of the training of specialists are the formulation of what the student will need to know, understand and/or be able to demonstrate at the end of the training process or part of it.

The results of the training of specialists are designed to:

- to help the student understand what is expected of them in the learning process, how and by what criteria the achieved result will be evaluated;
- to concentrate the attention and efforts of teachers on achieving the planned result and adequate assessment;
- to provide a clear idea to potential employers about the real possibilities of graduates of the educational program.

It is obvious that to develop an educational program of higher education, it is not enough just to describe it or define competencies. When defining each competence, it is important to identify all possible levels of its development, for each level of competence development - to identify descriptors (planned learning outcomes that can be measured and evaluated) and for each planned learning outcome to describe the indicators of its evaluation.

At the same time, it is very important to be extremely precise in the description of descriptors and indicators in order to ensure their compliance with teaching, learning and evaluation methods.

According to a number of authors, competencies are divided into 2 main blocks:

- knowledge (as information), assuming the ability to reproduce and explain information;
- know-how - the ability to do (act), while performing the functions of a mentor.

Knowledge signals the information acquired by the individual, which makes it possible to understand the world.

Know-how indicates the ability to act in a certain way in accordance with an established goal. At the same time, know-how, although it does not exclude knowledge, still does not always mean understanding why the practical skills used in action lead to results.

Thus, know-how is more related to empiricism, the inability to explain the technology and the result, and, therefore, is implicit (unformalized) knowledge.

The competence of specialists is the criterion of what needs to be done. The results of the training of specialists are a set of competencies (their elements) that signal that the student will know, understand and (or) be able to demonstrate upon completion of the training process for a specific educational program (module).

The models of competence of specialists reflecting the standards of effective behavior in the areas of training should be unified and accepted for management, both by employers and by the professional (pedagogical) community responsible for the quality of training.

To determine the results of training of engineering and technical personnel, the coordinating link is the types of activities specified in the EP that graduates can implement, depending on the competencies formed.

This list of activities can serve as a certain guideline for the personnel services of organizations, and for the relevant public administration bodies that develop the so-called qualification requirements.

One of the tools to ensure the integrity of the individual, according to the researchers, is the integration of the competencies of specialists; they also offer a clear scheme of such integration, which is carried out as follows:

- by comparison, they choose, first of all, the competence that has the greatest final relative importance. Further, a selection of competencies is made for it, which is less significant relative to the selected one, as well as equally significant. Thus, the expediency of choosing competencies that need to be integrated is ensured;
- reveal the KSA underlying the selected competencies;
- integrate KSA, using well-known pedagogical technologies.

The integrated competence of specialists is a component of "pedagogical integration", the process and result of combining differentiated sets of interrelated personality qualities (KSA, ways of activity, experience, motivation, etc.) necessary for productive activity in the field determined by the set of subjects and processes combined by these sets.

The most time-consuming and complex process is, of course, the last level of the technological stage - the design of the content of the educational program of higher education, according to the chosen structure.

2.2.3 Analysis of the final (corrective) stage of designing the educational program of higher education

The essence of the final (corrective) stage of designing an educational program of higher education is to develop procedures for assessing the level of quality of its development for specialists.

2.2.3.1 Systems for assessing the level of development of the educational program of higher equipment

The formation of a system for assessing the level of development of the educational program of higher education includes:

- selection of control points and determination of control and measuring materials;
- definition of evaluation criteria;
- formation of the rating scale.

For each educational program of higher education, funds of evaluation tools, forms of current control, intermediate and final attestations are formed, with the help of which the student will be able to demonstrate the achieved level of formation of this competence of specialists.

Diagnostics of specialists' competencies is carried out using a variety of diagnostic and self-diagnosis tools, such as questionnaires, performance of competence-oriented tasks, solving professional tasks, self-presentation, assessment sheets, self-assessment, standard tasks, control papers, tests.

The core of such a systematic approach should be the methodology of pedagogical measurements, the leading principles of which should include:

- combination of quantitative and qualitative measurement levels;
- the use of psychodiagnostic techniques and special theory to measure changes in the quality of educational outcomes;
- taking into account the totality of factors influencing the formation of competencies;
- ensuring high reliability (objectivity) of measurement results;
- ensuring high constructive, meaningful and predictive validity of measurement results;
- application of methods for analyzing the dimension of the measurement space and the use of multidimensional scaling methods;
- the use of longitudinal (time-factor-based) measurements, the transition to a mode of monitoring the quality of educational results;
- application of various measuring instruments (tests of academic achievements, tests of practical skills, case studies, psychological tests);
- the use of factor, variance and matanalysis to study data on the level of quality of training of students.

2.2.3.2 Criteria for assessing the level of quality of educational programs of higher education

Assessment of the quality level of the designed EP of higher education is a necessary condition for its successful implementation, while the evaluation criteria become a kind of "guideline" for effective management of the development of an EP.

The criteria for selecting and structuring a set of quality level indicators can be very different. Models of the education system, structured goals of the educational system, criteria for its effective functioning, and current management problems are sometimes taken as the basis for the allocation of such a set. Regardless of the reasons for the choice, the set of quality level indicators should be:

- adequate to the interpretations of the level of quality of education adopted by the pedagogical community;
- representative, with sufficient completeness;
- operationalized at the quantitative and qualitative levels of measurement;
- recognized by users and useful at various levels of management;
- suitable for collecting information about educational activities in the areas necessary in the management of the process;
- aimed at information that has predictive capabilities and has been significant for several years;
- reliable, simple and economically feasible.

The criterion apparatus for assessing the quality of the educational program of higher education, in turn, includes indicators that reflect their essential characteristics.

To characterize the level of quality of education of specialists, researchers identify generalized

groups of indicators that cover:

- data on educational systems;
- characteristics of the quality level of the educational process;
- characteristics of the quality level of learning outcomes;
- data on the intensity of scientific and innovative activity in the OHPE.

2.2.3.3 Groups of indicators for assessing the level of quality of educational programs of higher education

The indicators of the first group include:

- characteristics of the quality level of education content;
- structures and content of educational programs;
- forms of organization of the educational process;
- implementation of the goals of education and upbringing;
- the balance of the educational system, its stability, the ability to adapt when interacting with

the external environment;

- applied pedagogical technologies;
- systems of training and retraining of teaching staff;
- works to increase the motivation of educational and professional activities of teachers.

Indicators of the second group include characteristics:

- accessibility and individualization of training;
- organization of the educational process;
- humanistic and cultural-cognitive orientation of the educational process;
- standardization and variability of educational programs, the ratio of traditional and innovative teaching and control technologies;
- methods of organizing independent work of students in extracurricular time.

The third group consists of indicators based on the results of assessing the level of quality of educational achievements and requiring detailed additional information about the results of border control, information about further employment for correct interpretation.

The fourth group includes indicators of the intensity of innovative activity of the teaching staff.

Thus, the content of the indicators presented above is at the heart of the procedure for any type of examination of an educational program (national or international), as one of the most important components of assessing its level of quality.

CHAPTER 3 STRATEGIC DIRECTIONS OF HIGHER EDUCATION DEVELOPMENT IN THE REPUBLIC OF KAZAKHSTAN

According to the International Organization for Economic Cooperation and Development OECD, the economy of Kazakhstan over the past few decades has gone through a long period of steady growth with a steady increase in the value of gross domestic product per capita. This contributed to the improvement of the socio-economic living conditions of the country's citizens, reduced the level of poverty and increased market activity. The main engine of the country's development was the large-scale export of mineral and energy resources.

Such dependence of the country on external demand for oil, gas and natural resources is considered in the medium and long term as a potential threat and obstacle to the development of its scientific, technical and innovative potential. Due to the low level of economic diversification, a significant mass of the labor force in Kazakhstan is still employed in agriculture. One of the ways to achieve economic diversification is considered to be the switching of the national industry to the production of goods with high surplus value. As expected by the Government of the country, this will increase labor productivity and in the long term extend the period of uniform economic development.

One of the main goals of the system of higher and postgraduate education in Kazakhstan is to provide the industry with highly qualified personnel, modernize training and retraining programs for production, and increase labor productivity.

3.1 Priority direction "Ensuring high-quality training of competitive personnel"

3.1.1 Distribution and placement of the state educational order for the training of personnel with higher and postgraduate education.

3.1.2 Development of educational programs focused on learning outcomes and providing students with competencies that meet the expectations of employers, including in cooperation with foreign partner universities and research centers.

3.1.3 Strengthening and expanding ties with employers for the employment of graduates together with state and local executive bodies.

3.1.4 Conducting information campaigns on the training of competitive personnel.

3.1.5 Attracting foreign students to universities in the country.

3.2 Priority direction "Modernization of the content of higher and postgraduate education in the context of global trends"

3.2.1 Improving the rules of admission to higher education institutions.

3.2.2 Training in educational programs of higher and postgraduate education in 3 languages.

3.2.3 Internships, advanced training courses, distance learning technologies to improve the language competencies of teachers and students.

3.2.4 Activation of work on the passage of international accreditation by universities as a condition for granting academic independence.

3.2.5 Conducting information campaigns on the modernization of the content of higher and postgraduate education in the context of global trends at the expense of universities.

3.3 Priority direction "Improvement of management and monitoring of the development of higher and postgraduate education"

3.3.1 Step-by-step implementation of the experience of Nazarbayev University in matters of academic and managerial independence in civil universities.

3.3.2 Introduction of the practice of annual reporting of rectors of civil universities to the public.

3.3.3 Conducting information campaigns on the transition to a new organizational and legal form of universities.

3.4 Priority direction "Development of infrastructure of higher educational institutions"

3.4.1 Creation of innovative structures by universities, monitoring and evaluation of the effectiveness of their functioning.

3.4.2 Conclusion and implementation by the basic universities of the state program of industrial and innovative development-2 of tripartite agreements between the university, scientific organization and business.

3.4.3 Implementation of the World Bank project on modernization of the content of pedagogical education.

3.4.4 Provision of state universities with modern learning conditions, acquisition of the latest educational and laboratory equipment, improvement of the quality of education, construction of educational and laboratory buildings Republican State Enterprise on the Right of Economic Management "North Kazakhstan State University named after M. Kozybayev", applied development of training programs, involvement of students in the scientific environment and increasing the proportion of foreign students.

3.5 Key success factors of the project in the Republic of Kazakhstan

The following key factors contributed to the successful implementation of the project in the Republic of Kazakhstan:

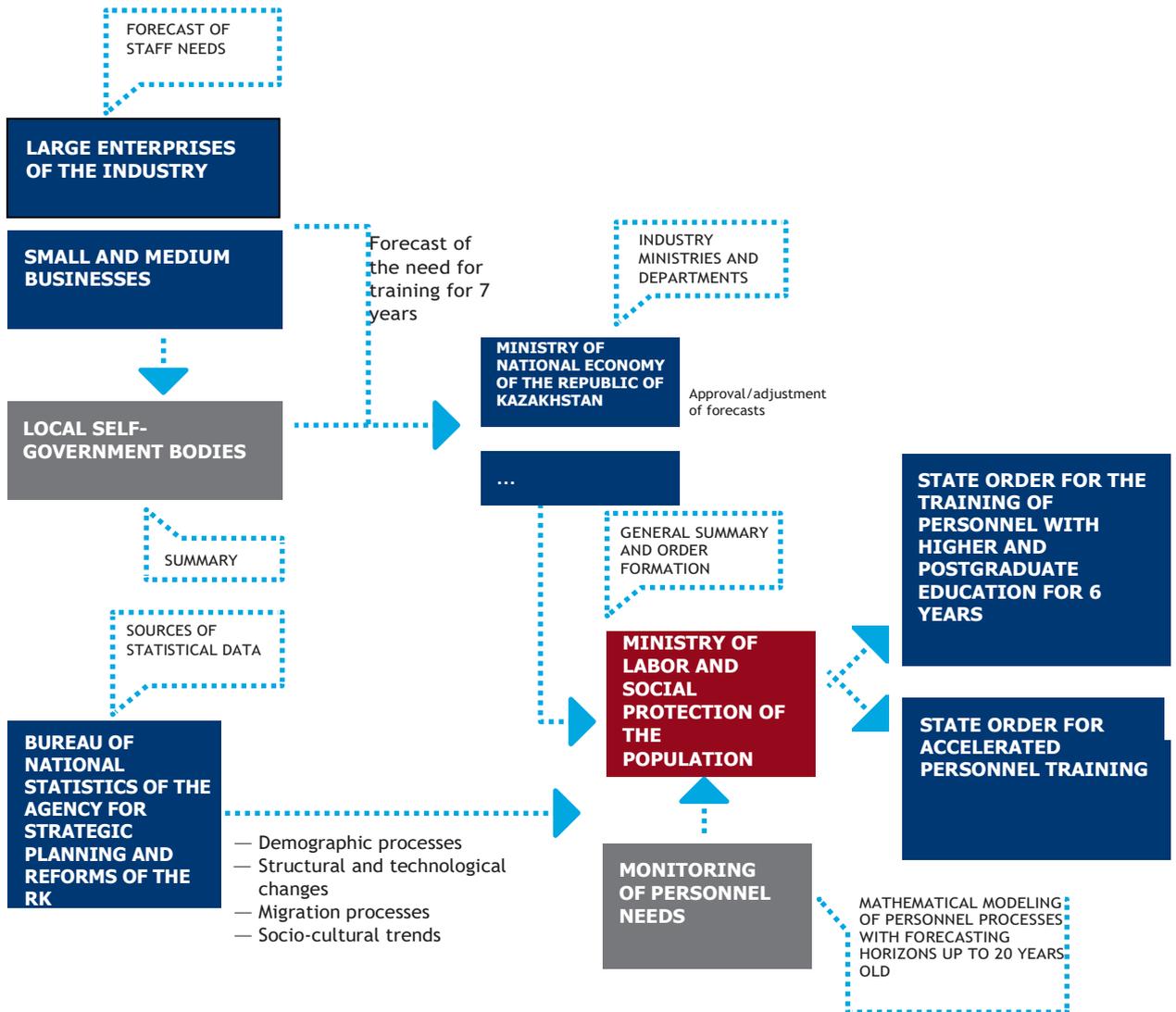
- Development of a comprehensive strategy for the development of education and science, taking into account individual goals and key performance indicators for the system of higher and postgraduate education.
- Involvement of representatives of the business community in the system of higher and postgraduate education at various levels and the creation of scientific and educational production clusters.
 - Identification of priority areas of training for each OHPE.
 - Creation of a unified system of standards in the Republic of Kazakhstan in terms of requirements for knowledge, skills, skills and competencies; unification of educational programs.
 - Building a single platform for interaction between employers, as well as active promotion of higher and postgraduate education in the region.

3.6 Algorithm of implementation of the project of the Republic of Kazakhstan

3.6.1 Choosing a coordinator

The coordinator of the process of implementing the dual training (education) system is the Coordinating Council.

The forecast of industry and regional needs is carried out in accordance with the established algorithm.



When forming the forecast, the prospects for the development of enterprises, the creation of new jobs, the availability of labor resources and vacant jobs, the retirement of employees due to natural attrition and a reduction in the number of staff, work on the replacement of foreign labor are taken into account.

The system of personnel needs monitoring is used by the Ministry of Education and Science of the Republic of Kazakhstan as one of the tools for forming and adjusting control figures for admission to training programs for highly qualified specialists at the expense of the republican budget.

3.6.2 Updating educational programs

The development and updating of educational programs is the following sequence of steps:

1	DEVELOPMENT OF A GRADUATE COMPETENCE MODEL	THE DEVELOPMENT IS CARRIED OUT JOINTLY WITH REPRESENTATIVES OF THE EMPLOYER COMPANY ON THE BASIS OF THE PROFESSIONAL STANDARD OF THE ENTERPRISE, THE QUALIFICATION CHARACTERISTICS OF THE POSITIONS OF WORKERS/EMPLOYEES AND THE SMSE OF THE RK
2	CONDUCTING A COMPARATIVE ANALYSIS OF THE GRADUATE'S COMPETENCY MODEL	COMPARISON OF THE COMPETENCE MODEL FORMED ON THE BASIS OF THE PROFESSIONAL STANDARD OF THE ENTERPRISE AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE EP. IDENTIFICATION OF KNOWLEDGE, SKILLS AND COMPETENCIES, THE PRESENCE OF WHICH IS NECESSARY FOR THE EMPLOYER, BUT IS NOT FORMED IN ACCORDANCE WITH THE EP.
3	INTRODUCTION OF ADDITIONS TO THE EDUCATIONAL PROGRAM OF HE	INTRODUCTION OF ADDITIONAL DIDACTIC UNITS, NEW DISCIPLINES, TYPES OF WORK, PROFESSIONAL MODULES, THAT ALLOW IMPLEMENTING THE REQUIREMENTS OF THE EMPLOYER, AS A RULE, IN THE VARIABLE PART OF THE EP OF HPE.
4	DETAILED STUDY OF THE CONTENT OF PROFESSIONAL MODULES	DEFINITION OF THEORETICAL, LABORATORY AND PRACTICAL PART OF DISCIPLINES AND PROFESSIONAL MODULES
5	CURRICULUM DEVELOPMENT	FORMATION OF THE CURRICULUM, TAKING INTO ACCOUNT THE REQUIREMENTS OF EMPLOYERS TO DEEPEN THE STUDY OF INDIVIDUAL DISCIPLINES/PROFESSIONAL MODULES, AS WELL AS TAKING INTO ACCOUNT THE RESULTS OF COMPARATIVE ANALYSIS OF COMPETENCY MODELS
6	COORDINATION OF TRAINING CLASSES ON THE BASIS OF ENTERPRISES AND CORRECTION OF THE SCHEDULE OF THE EDUCATIONAL PROCESS	COORDINATION IS CARRIED OUT WITH REPRESENTATIVES OF THE EMPLOYER'S COMPANY, AFTER WHICH THE OBTAINED RESULTS ARE RECORDED IN THE SCHEDULE OF THE EDUCATIONAL PROCESS (IN ACCORDANCE WITH THE LOCATION OF THE TOPIC IN THE DISCIPLINE PROGRAM).
7	DEVELOPMENT OF THE EP OF HE	IT IS CARRIED OUT TAKING INTO ACCOUNT ALL NECESSARY ADDITIONS
8	PREPARATION OF THE CURRICULUM	IT IS CARRIED OUT TAKING INTO ACCOUNT THE PRIORITY OF STUDYING THE DISCIPLINES OF THE GENERAL EDUCATION CYCLE NECESSARY FOR THE SUCCESSFUL DEVELOPMENT OF THE MODULES OF THE PROFESSIONAL CYCLE

3.6.3 Organization of professional practice

For the organization and conduct of dual training organization of HPE:

- draws up a contract on network interaction in the implementation of dual training;
- together with the basic enterprise, it develops a dual training program in accordance with the requirements of employers, a working curriculum, an annual calendar schedule of the educational process, an action plan to ensure the educational process;
- coordinates with the base company the timing of the dual training and the list of students sent to the base company.

At the basic enterprise, each student during the implementation of the dual training program is assigned to a mentor - the most qualified specialist of the enterprise.

MENTORING GOALS:

- transfer of personal professional experience, training in the most rational techniques and methods of work.
- ensuring optimal use of time and resources, mobile adjustment of students' professional skills.
- comprehensive development of students of all types of professional activity, the formation of general and professional competencies.
- increasing the motivation of students to establish long-term labor relations with the enterprise and introducing students to the corporate culture of the enterprise.

ASSESSMENT OF THE QUALITY OF HIGHER EDUCATION

INDEPENDENT ASSESSMENT OF THE QUALITY OF HIGHER EDUCATION

PRODUCTION EXAM

SPECIALIZED ACCREDITATION OF EDUCATIONAL PROGRAMS

One of the key elements of the assessment is the conduct of an industrial exam.

The composition of the production exam includes theoretical questions and qualification work. The content of the production exam corresponds to the qualification characteristics of a particular profession.

Control and measuring materials for the production exam are developed jointly with the masters of industrial training of the organization of higher and postgraduate education and representatives of the enterprise (no later than 1 month before the exam).

The procedure for conducting the production exam:

- The basis for admission to the production exam is the decision of the expanded pedagogical council, to which mentors are invited.
- The result of the production exam is an assessment based on the results of theoretical and practical training.
- The assessment on the production exam is the final assessment of professional practice.
- The production exam is conducted by an expert commission, which is organized for each educational program.

Composition of the expert commission: 50% - representatives of the enterprise, 50% - experts from third-party educational organizations or partner enterprises.

In addition, one of the key tasks is the specialized accreditation of educational programs.

Subject to evaluation are:

- Objectives and purpose of educational programs: compliance of EP with the needs of employers;
- The content of the educational program: the validity of employers' requirements and the distribution of its variable part;
- Conditions for the implementation of the educational program: involvement of specialists from the real sector of the economy in the implementation of the educational program;
- Quality of training of students in the educational program: satisfaction of employers with the level of quality of training.

The examination of educational programs allows you to determine and measure whether the conditions and processes of training specialists meet the requirements of professional standards and educational programs. The results of the examination are the basis for recommendations to improve the efficiency and quality of the implementation of the educational process. An important effect is the identification of problem areas and resource areas for improving the quality of education through the involvement of all stakeholders in the assessment process: from business representatives to students.

3.7 Expected results on improving the design of educational programs of higher education in the Republic of Kazakhstan

Improving the design of educational programs in the higher education system with credit technology training will ensure:

- Increasing the availability of high-quality education that meets the requirements of innovative economic development, modern needs of society and every citizen;
- Orientation of higher education to meet the needs of the economy and the labor market;
- Expansion of employers' participation at all stages of the educational process, interaction of the higher education system and business;
- Openness of higher education to external demands;
- Ensuring accessibility of higher education for different segments of the population and the degree of compliance with their needs;
- Ensuring an appropriate level of quality of higher education;
- Modernization of management mechanisms of the system of higher and postgraduate education and its financing;
- Development of mechanisms of social partnership, networking and independent evaluation of the results of training specialists;
- Creating conditions for the self-realization of specialists throughout their lives on the basis of the development of the certification system of professional competencies.

Higher education is aimed at solving the problems of intellectual, cultural and professional development of a person and aims to train specialists in all major areas of socially useful activities in accordance with the needs of society and the state, as well as meeting the needs of the individual in deepening and expanding education.

In order to align the areas of training of highly qualified personnel and their placement in the regions with the educational needs of the population, the needs of the developing economy and labor market, prognostic indicators of regional development, ensuring access of the general population to higher professional education, it is necessary:

- The formation of the volume and profile structure of personnel and specialists training should be carried out in accordance with the needs of the population and the labor market;
- Expanding the training of specialists for knowledge-intensive and high-tech industries, for providing information technology, social services, service and service sectors, agriculture, construction and transport;
- Development of higher educational institutions, including rare specialties of national importance;
- Development of multidisciplinary and multifunctional educational institutions to provide a wide range of educational services;
- Creation of regional intersectoral centers for training, retraining and advanced training of personnel.

The design of educational programs in the system of higher and postgraduate education with the credit technology of training specialists will ensure:

- Improving the competitiveness of the level of higher education, both in terms of the content of educational programs and the quality of educational services;
- Personal and socially-oriented choice and access to any level of higher education;
- Creation of a national system for providing economic sectors with highly qualified personnel who possess modern production technologies obtained with the help of new information and pedagogical training tools;
- Integration of the national system of higher and postgraduate education and training into the global educational space, increasing the competitiveness of Kazakhstani specialists in the global labor market;
- Improving the rationality of the placement of organizations of higher and postgraduate education in territorial and profile aspects;
- Balance of regional and sectoral interests;

- Increasing the accessibility of higher education aimed at improving the satisfaction of the needs of the population in education of various profiles;
- Development of autonomy of organizations of higher and postgraduate education, democratization of management at the level of educational institutions; creation of an effective system of public administration of higher education;
- Development of multidisciplinary and multifunctional organizations of higher and postgraduate education as the basis for expanding the range of educational services;
- Strengthening the connection of the system of higher and postgraduate education with employers, increasing the effectiveness of cooperation between subjects of social partnership;
- Expanding the possibilities of multi-channel financing of educational institutions of higher and postgraduate education to ensure the educational process, economic and social support for students and employees, the development of the material and technical base of organizations of higher and postgraduate education;
- Development of the system of training and professional retraining of personnel for higher education; professional development of teachers and managers of organizations of higher and postgraduate education; renewal of teaching staff;
- Creation of new textbooks, educational and methodical complexes, teaching aids in accordance with the requirements of the state mandatory standard of education; development of the use of information systems and technologies, telecommunications networks in the educational process;
- Development of scientific and innovative activities in the system of higher and postgraduate education;
- Reduction of unemployment among the population, including youth;
- Development of international cooperation in the field of higher education;
- Expansion of academic mobility of students and graduates in the international market of educational services.

List of abbreviations used and their designations

ECTS	European Credit Transfer and Accumulation System
GPA	Grade Point Average
BD	Basic Disciplines
HE	Higher Education
SMSE	State mandatory standart of education
SPIID	State Program of Industrial and Innovative Development
KSA	Knowledge, skills and abilities
InEU	Innovative University of Eurasia
MES	Ministry of Education and Science
RLA	Regulatory legal acts
OHPE	Organization of higher and postgraduate education
GED	General education disciplines
EP	Educational program
MD	Major disciplines
PP	Professional practice
RSE on the right of EM	Republican state enterprise on the right of economic management
RK	Republic of Kazakhstan
REA	Regional executive authorities
DTS	Dual training system
AA	Academic achievements

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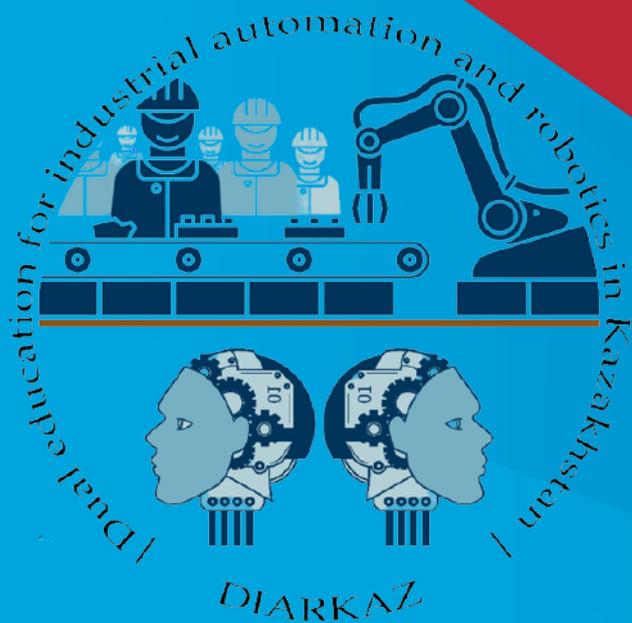
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