THE SELF-CERTIFICATION REPORT ON COMPATIBILITY OF THE KAZAKHSTAN NATIONAL QUALIFICATIONS FRAMEWORKS FOR THE HIGHER EDUCATION WITH THE FRAMEWORK FOR QUALIFICATIONS OF THE EUROPEAN HIGHER EDUCATION AREA

Nur-Sultan, 2020

Contents

LIST OF ABBREVIATIONS

RK	The Republic of Kazakhstan
ISCED	International standard classification of education
QF-EHEA	Framework for Qualifications of the European Higher Education Area
EQF	European Qualifications Framework
SCES	State compulsory educational standard
HEREs	National Team of Higher education reform experts
MLSPP	The Ministry of Labor and Social protection of population
EQAR	The European quality assurance register
ENQA	The European Association for Quality Assurance in Higher Eduction
ECTS	The European Credit Transfer and Accumulation System
ESG	The European Standards and Guidelines for Quality Assurance
EHEA	The European Higher Education Area
ENIC-NARIC	Network of Information Centers on academic recognition
BFUG	The Bologna Follow-Up Group
NQS	The National Qualifications system
NQF	The National Qualifications framework
HE-NQF	The National Qualifications framework for Higher education
SQF	The Sectoral qualifications framework
PS	The Professional Standard
SPDEdS	The State Program for development of education and science
MES RK	The Ministry of education and science of the Republic of Kazakhstan
NCE “Atameken”	The National Chamber of entrepreneurs of the Republic of Kazakhstan «Atameken»
IQAA	The Independent Agency for Quality Assurance in Education
IAAR	The Independent Agency for Accreditation and Rating
KAZSEE	The Kazakhstan Association for engineering education
ARQA	The Independent Agency for accreditation and examination of the quality of education
ECAQA	The Eurasian Centre for Accreditation and Quality Assurance in Higher education and Health care
ACBSP	Accreditation Council for Business Schools and Programs
MusiQuE	Music Quality Enhancement
ASIIN	The Accreditation Agency for educational programs on engineering science, computer science, natural science
ACQUIN	Accreditation, Certification and Quality Assurance Institute
FIBAA	The Foundation for International Business Administration Accreditation
TPE	Technical and professional education

EP	Educational programs
PhD	Doctor of philosophy
BP	The Bologna process
UNT	Unified national test
BPAMC	The Bologna process and academic mobility Center
ICT	Information and communication technologies
GEC	General education courses
BC	Basic discipline
MOOC	Massive open online course
GCEA	The General Classification of Economic Activities
NCLA	The National Classification of Learning Activities
NQT	The National Qualification Test

Glossary

1) qualification – any degree, diploma or other certificate issued by a competent authority that confirms that certain learning outcomes have been achieved, usually after the successful completion of a recognized (licensed) educational program.

2) qualification level – a series of sequential steps (logical development) expressed as part of a range of general results against which typical qualifications can be established

3) descriptor – description of the main learning outcomes achieved by students upon completion of higher education programs at different levels of qualifications.

4) national qualifications system – a set of documents (NCLA (see page 20), NQF, SQF, PS), united by a single system of principles, mechanisms and criteria for assessment of the achieved qualifications, and allowing to regulate the supply and demand for qualifications of specialists in the labor market, as well as allowing to ensure interaction between education and the labor market;

5) national qualifications framework – a unified description of qualifications based on learning outcomes, defining level descriptors, and through which all qualifications and other achievements in higher education can be described and linked to each other in a consistent way, and which defines the connection between higher education qualifications;

6) international qualification – a qualification awarded by an officially established international body (association, organization, sector, or company), or by a national body acting on behalf of an international body, that is applied in more than one country, and that includes learning outcomes evaluated in accordance with standards set by an international body;

7) learning outcomes - description of what the learner knows, understands, and is able to do at the end of the learning process;

8) ability – a personality trait, which is a condition for the successful implementation of a certain type of activity;

9) knowledge – a result of processing of information as a set of facts, principles, theories and practices related to the field of work or learning;

10) skill - ability to apply knowledge and use know-how to perform tasks and solve problems;

11) proficiency – established ability to effectively perform certain work in the course of repeated use of knowledge and skills;

12) responsibility and autonomy – a student's ability to apply knowledge and skills independently and responsibly;

13) competence – acquired ability to solve personal, social, and/or methodological problems in professional and personal communication situations based on knowledge, skills, and experience;

14) validation of non-formal and informal learning – process of recognition by the competent authority that a person through non-formal and informal learning has achieved learning outcomes that meet a certain educational standard. The recognition

process involves: 1) identifying specific learning outcomes during the interview; 2) documenting the results of the interview in order to visualize the individual experience of a student; 3) formally evaluating this experience; and 4) certifying the evaluation results. Based on the results of the recognition process, it is possible to award a partial or full qualification;

15) formal recognition of learning outcomes – process of granting official status by the competent authority to the received learning outcomes for further learning or employment by (i) awarding qualifications (certificates, diplomas or titles); (ii) validating non-formal and informal learning; (iii) confirming compliance, allocating credits or granting exemptions;

16) academic credit – unified unit of measurement of the volume of scientific and (or) educational workload of a student and (or) teacher;

17) transfer of credits – a process that allows individuals who have accumulated credits in one context to evaluate and recognize them in another context;

18) sectoral qualifications framework – structured description of the qualification levels recognized in a particular industry;

19) Bachelor’s degree – a level of higher education aimed at training personnel with the award of a bachelor's degree in the corresponding educational program with the mandatory development of at least 240 academic credits;

20) Higher special education (specialist degree) – a level of higher education aimed at training personnel with the qualification of a specialist in the corresponding educational program with the mandatory development of at least 300 academic credits;

21) Master’s degree – a level of postgraduate education aimed at training personnel with the award of the Master's degree in the corresponding educational program with the mandatory development of at least 60-120 academic credits;

22) PhD – postgraduate education, whose educational programs are aimed at training personnel for scientific, pedagogical and (or) professional activities, with the award of the degree of doctor of philosophy (PhD) or specialized doctor with the mandatory development of at least 180 academic credits.

23) residency – a level of postgraduate medical education, the purpose of which is to acquire or change the professional qualification of a doctor in the relevant specialty to get access to an independent clinical practice with the mandatory development of at least 140 academic credits.

Synopsys

The Self-certification of the National Qualifications Framework for Higher education (hereinafter referred to as HE-NQF) contains the results of two interdepartmental Working groups on self-certification established by the Ministry of education *(Order No. 111 dated 28.03.2013, Order No. 152 dated 17.04.2019).*

The last working group included the representatives of the Ministry of education and science, the Ministry of labor and social protection of the population, the National chamber of entrepreneurs "Atameken", industry associations and higher education institutions.

This working group has developed a separate National qualifications framework for higher education, compatiable with the overarching Framework for Qualifications of the European Higher Education Area (QF-EHEA).

Self-certification is carried out in order to ensure recognition of the qualifications of Kazakhstan's higher education institutions graduates and increase their competitiveness both within the country and abroad.

The purpose of this report is to demonstrate to the Bologna process country-members and other stakeholders that the system of higher and postgraduate education of the Republic of Kazakhstan in the process of directed reforming is built in accordance with the key principles and program documents of the Bologna declaration that define its educational policy. Compatibility and comparability of RK HE-NQF and QF-EHEA indicates the successful harmonization of the national system of higher and postgraduate education of Kazakhstan with the Bologna process.

The HE-NQF was developed in accordance with the General strategies, frameworks and toolkits for the development of higher education in the European higher education system. It is designed to ensure active cooperation and partnership between ministries and the higher education system of the Republic of Kazakhstan, between employers and universities, between universities and citizens.

The implementation of HE-NQF is aimed at:

- internationalization of higher and postgraduate education in Kazakhstan;
- to ensure the possibility of social integration based on the principles of development of the social dimension and lifelong learning;
- to achieve international compatibility of Kazakhstan's academic programs and qualifications through the description of learning outcomes in the system of knowledge, skills and competencies that meet the needs of the modern labor market;
- formation of a unified national area for educational services and labour market through the creation of a common methodological ground for sectoral qualifications frameworks, professional and educational standards and educational programs of the Republic of Kazakhstan, which will ensure the objectivity of the State order for training and quality certification;

- to improve the quality of educational services for all categories of citizens based on university and civic values, which will allow everyone to become successful in the future;

- to improve the quality parameters of academically flexible educational programs based on modern generally recognized scientific and theoretical knowledge, provided with advanced educational technologies, including digital ones, implemented by universities, mainly together with potential customers, employers, and foreign partners.

The report consists of a synopsis and 4 parts.

Introduction

The increasing labor and academic mobility of citizens is a global trend in the 21st century

The Bologna process was initiated in 1999 by the Ministers of education of 29 countries in order to promote the mobility of citizens at the labor market and strengthen the competitiveness of European higher education, and to harmonize national higher education systems.

In order to ensure compatibility of qualifications obtained in different countries, the overarching Qualifications framework for the European Higher Education Area (QF-EHEA) was developed and approved in 2005 at the conference of Ministers of education of the Bologna process countries.

This framework was created to link the various national qualifications frameworks with the Bologna framework in order to strengthen international transparency and recognition of qualifications.

All higher education cycles of QF-EHEA are based on Dublin descriptors that describe the main learning outcomes achieved by students upon completion of higher education programs at different levels of qualifications.

In 2007 at the meeting of Ministers of higher education in London, it was determined that the link between the national qualifications framework and QF-EHEA will be implemented through a self-certification procedure, when responsible authorities of countries provide reports confirming that the national framework corresponds to QF-EHEA.

In 2012 Kazakhstan developed and approved the National qualifications framework (NQF), which contains 8 levels and formally corresponds to the European qualifications framework adopted in 2008.

In order to prepare a self-certification report the Interdepartmental working group was established by the order of the Minister of education and science of the Republic of Kazakhstan *(Order No. 111 dated 28.03.2013).*

It was takenthe descriptors of 6-8 levels of NQF corresponding to higher and postgraduate education for the compatibility with QF-EHEA. The Draft report showed that these descriptors do not fully correlate with the descriptors of QF-EHEA.

The relevant comments made by the foreign experts: Eva Khmelecka (Poland) and Volker Gehmlich (Germany). Both experts drew attention to the lack of compatibility of descriptors. In particular, NQF descriptors focus on work, while the QF-EHEA also includes the learning process. In addition, attention is paid to the descriptors identity of level 5 and level 6.

At 2018 Ministerial conference in Paris, the issue of self-certification was re-actualized. One of the three key commitments was "a three-cycle system compatible with the overarching Qualifications framework of EHEA and first-and second-cycle degrees comparable to ECTS".

The Interdepartmental Working group was established by order of the Minister of education and science *(order No. 152 dated 17.04.2019)* to prepare a new Report on self-certification.

Having studied the weaknesses the Second working group, composed of the representatives of MES and MLSPP, "Atameken", industry associations and universities, decided to develop a separate Qualifications framework for Higher education, given its compatibility with QF-EHEA.

This group has re-developed descriptors for higher and postgraduate education levels: bachelor's, master's, and PhD. The short cycle was not considered, since in accordance with the Law of the Republic of Kazakhstan "About education" (dated June 7, 1999), it does not apply to higher education.

The compatibility procedure with QF-EHEA was carried out in accordance with the established criteria and procedures.

The results of the analysis allow us to conclude that the developed HE-NQF is correlated with the QF-EHEA. The conclusion was supported by all stakeholders who were included in the consultation process.

The aim and procedure of self-certification

The criteria and procedures of self-certification

Self-certification is based on the procedures and criteria developed by the Bologna process Working group on the qualifications framework presented at the meeting of Ministers of education in Bergen in 2005. The criteria and procedures were adopted at the meeting of Ministers of higher education in London in 2007. The list includes seven verification criteria to confirm the compatibility of the National qualifications framework and the Bologna framework, and six procedures to guide the self-certification process.

Criteria

- The national framework for higher education qualifications and the body or bodies responsible for its development are designated by the national ministry with responsibility for higher education
- There is a clear and demonstrable link between the qualifications in the national framework and the cycle qualification descriptors of the European framework
- The national framework and its qualifications are demonstrably based on learning outcomes and the qualifications are linked to ECTS credits
- The procedures for inclusion of qualifications in the national framework are transparent
- The national quality assurance system for higher education refer to the national framework for higher education qualifications and are consistent with the Berlin Communiqué and any subsequent Ministerial Communiqués in the Bologna Process
- The national framework, and any alignment with the European framework, is referenced in all Diploma Supplements

- The responsibilities of the domestic parties to the national framework are clearly determined and published.

The Self-certififcation procedures.

- The competent national body/bodies shall self-certify the compatibility of the national framework with the European framework.
- The self-certification process shall include the stated agreement of the quality assurance bodies of the country in question recognised through the Bologna Process.
- The self-certification process shall involve international experts.
- The self-certification and the evidence supporting it shall address separately each of the criteria established and shall be published
- The ENIC/NARIC network shall maintain a public listing of States that have completed the self-certification process [www.enic-naric.net].
- The completion of the self-certification process shall be noted on Diploma Supplements issued subsequently by showing the link between the national framework and the European framework.

1. The Kazakhstan Higher education system

1.1 The main stages of modern higher education development

The achievement of independence by the Republic of Kazakhstan in 1991 led to the most important task - entry into the world community, compatibility and gradual integration of the national education system into the international educational area. Therefore, the State policy in the field of education was carried out in the direction of reforming the legislative framework, management and financing in the context of the task, which initiated the formation of a new national model of education.

It should be noted that Kazakhstan made the transition to a two-level system of higher education somewhat earlier than the Bologna Declaration signed by the ministers of education of 31 European countries on June 19, 1999.

Thus, on June 7, 1999, the Law of the Republic of Kazakhstan "About education" was adopted, according to which, along with the previously existing higher special education, it was introduced into the structure of higher professional education: higher basic education (Bachelor's degree) and higher scientific and pedagogical education (Master's degree). The implementation of first cycle programs is carried out for four years and completed with the award of the appropriate qualification and "Bachelor" academic degree to persons who successfully passed the final certification. Higher scientific and pedagogical education is confirmed by awarding qualification and "Master" academic degree to a person who successfully passed the final certification At the same time, the term of study on the Master's program on the basis of higher basic education was two years; on the basis of higher special education - one year.

However, for 5 years after the adoption of the Law “About education”, higher special education remained the main and only level in Kazakhstan. Only certain universities with good international connections experimentally implemented Bachelor's and Master's degree programs. The full transition to two-level higher

education occurred in 2004, when most universities in Kazakhstan switched to training bachelors and masters for 4 and 2-year educational programs respectively, using the credit system.

At the same time, the Classifier of higher education specialties was adopted at the Bachelor's and Master's levels, by which the Kazakhstan universities could teach specialists.

It should be noted that initially, the American model of the credit system was taken as the basis of the Kazakh credit learning technology. At the same time, special transfer coefficients were introduced to transfer Kazakhstani credits to ECTS ones.

Since 2018, a Kazakhstan credit has been equated to ECTS credit.

The Ministry of education and science of the Republic of Kazakhstan approved the State compulsory educational standards for Bachelors and Masters for all specialties specified in the Classifier of higher education specialties. The standards for Bachelors training provided a list of qualifications and positions that could be held by graduates of this specialty. The qualification characteristic of a Bachelor was given, including the sphere of professional activity, objects, subjects and types of professional activity. For example, organizational and technological, production and management, design, research, educational (pedagogical) characteristics.

The standards specified the requirements for the key competencies of a Bachelor: what one should know and be able to do, what skills one should have, in what one should be competent and what one should have an idea about. The standards defined the main national goals of education and a hierarchy of goals (goals for cycles of disciplines), as well as requirements for the level of education of graduates. Among them there were requirements for general education, for social and ethical competence, for economic, organizational, managerial, and professional competencies; readiness to change social, economic, professional roles, geographical and social mobility.

Currently, the level of education of the Kazakhstan population is relatively high and close to the average level of the OECD countries. Among adults aged 25 and above, about 40% have secondary education as the highest level of the obtained education, 30% have a College degree, and 25% have higher education[1] .

The dynamics of the higher education institutions students number in Kazakhstan is presented in table 1.

Table 1. Kazakhstan: number of students

	Academic year				
The Level	**2014- 2015**	**2015 - 2016**	**2016 - 2017**	**2017-2018**	**2018-2019**
Bachelor’s degree	477 387	459 369	477 074	496 209	479 914
Master’s degree	32 527	29 882	32 893	34 609	36 720
PhD	2 063	2 288	2 710	3 603	4 937
Total	**511 977**	**491 539**	**512 677**	**534 421**	**521 571**

The Law of the Republic of Kazakhstan "About education", adopted in 2007, established a legal basis for the implementation of a three cycle learning model. The

[1] National report on the state and development of the education system of the Republic of Kazakhstan (for the years of independence), IAC, 2017.

three cycle system of higher and postgraduate education (Bachelor – Master – PhD) provides for the movement from general to specific, i.e. first of all, a person receives a general education on any direction, and then gradually moves to a specific learning through educational programs focused on specialization. From the point of view of the methodology and ideology of training, such system allows a student to develop the student's abilities and skills for lifelong learning, to acquire interpersonal communication skills. It provides a fairly clear implementation of knowledge acquisition, helps to diversify the methodology and learning methods at different cycles.

The three cycle system corresponds to the nature of university education, the main goal of which is to prepare well-educated people who are ready to work in conditions of increasing requirements for professional mobility, who are able to move away from stereotypes and offer new ideas and make decisions of strategic importance. Credit technology has been introduced at all these cycles which has a accumulative nature.

In order to improve the content of education, it is planned to improve and harmonize the state compulsory educational standards at all cycles, and to update curricula and programs taking into account the introduction of innovative educational technologies.

In July 2018, the Law of the Republic of Kazakhstan "About education" was amended to expand the academic and administrative freedom of universities. They regulate three main areas of university activity: academic, administrative, and financial.

In the content of educational programs, the academic freedom of higher education institutions has been expanded from 65% to 85%. To do this, universities are given the authority to independently develop educational programs that are oriented to the needs of the labor market. For accounting and information of these educational programs, the Unified Register of educational programs has been created through the education information system.

The transition to educational programs that respond flexibly to the needs of the labor market required that the Classifier of higher education specialties be abandoned. Instead, the Classifier of studying fields with higher and postgraduate education was introduced, within it universities can develop new educational programs in accordance with the requirements of the labor market.

The Classifier includes 55 directions and 12 fields of education:

1. Pedagogical sciences;
2. Art and humanities;
3. Social sciences, journalism and information;
4. Business, administration and law;
5. Natural Sciences, mathematics and statistics;
6. Information and communication technologies;
7. Engineering, manufacturing and construction industries;
8. Agriculture and bioresources;
9. Veterinary science;
10. Health and social security (medicine);
11. Services;

12. National security and military affairs.

1.2 The types of Higher education institutions

Nowadays, 131 Kazakhstan universities conduct educational and research activities in the field of higher and postgraduate education, including 11 national, 30 state, 14 non-citizen, 1 international, 18 corporatised, 56 private and 1 autonomous educational organization (Nazarbayev University).

Higher and (or) postgraduate education is provided by organizations of higher and (or) postgraduate education (hereinafter referred to as HEIs) of the following types: national research universities, national organizations of higher and (or) postgraduate education, research universities, universities, academies, institutes and equivalent to them (conservatory)[2].

The right on educational activity arises at higher education institutions from the date of issuance of the license.

The type of university is determined at the licensing stage and depends on the number of implemented educational programs, the number of students, research activities and is confirmed by accreditation.

1.3 The Kazakhtan three-cycle higher and postgraduate education

The introduction of a three-cycle education model (Bachelor – Master – PhD), the correlation of its cycle qualifications with the qualification descriptors of cycles in the European structure, contributed to the recognition of Kazakhstan academic degrees abroad, opened new opportunities for learning and employment. The compatibility of higher and postgraduate education systems makes it possible to expand the cooperation of higher education institutions to create joint and double-degree educational programs.

1.3.1 The First cycle programmes (Bachelor’s degree).

Bachelor’s degree - higher education, whose educational programs are aimed at training personnel with the degree award of Bachelor in the corresponding specialty[3].

To obtain a Bachelor's degree, a student must master at least 240 academic credits. In this case, 1 academic credit is equal to 30 academic hours. This parameter is the basis for determining the academic load of a student at a Kazakhstan university.

The Qualifications awarded at the Bachelor's degree. The specialization of the Bachelor's degree program, which represents its specific features, is determined in accordance with the Classifier of studying fields with higher and postgraduate education of the Republic of Kazakhstan (hereinafter referred as the Classifier) and is characterized by belonging to the relevant field of education, to the subject area of study, and the system of expected learning outcomes.

2 The Standard rules of activity of educational organizations that implement educational programs of higher and (or) postgraduate education. // Order No. 595 of the Minister of education and science of the Republic of Kazakhstan dated "30" October 2018

[3] Law of the Republic of Kazakhstan No. 319-III of July 27, 2007 "About education" / / Chapter I, article 1

A student, who has passed the final certification, is awarded a Bachelor's degree or qualification of a "specialist"[4]. HEI additionally issues to a graduate the European Diploma Supplement for free.

The transcript contains the General information about a graduate (personal data, entrance tests, previous education, etc.), information about the educational program, the title of the discipline, the number of mastered academic credits with equating to ECTS, and the final certification evaluation reflecting the quality of knowledge.

Among those who enter the Bachelor's program, a competition is held for UNT points to receive a state grant for studying in universities that implement educational programs of the first cycle and have passed specialized (program) accreditation. State grants are allocated at the Republican (Government) and local (regional) level.

1.3.2 The Second cycle programmes (Master, residency).

Master's degree - a cycle of postgraduate education aimed at training personnel with the degree award of a Master on the corresponding educational program with the mandatory development of at least 60-120 academic credits[5].

The criterion of completion of the educational process is the development of:

1) at least 120 academic credits for the entire period of study, including all types of educational and scientific activities for the scientific and pedagogical master's program;

2) 60 academic credits with a period of 1 year study and 90 academic credits with a period of 1.5 year study for the specialized master's program,.

Persons who have completed the Master's degree program and successfully passed the final certification are awarded the Master's degree and obtain a diploma of postgraduate education with a supplement (transcript).

HEI or scientific organization additionally issues to a graduate the European Diploma Supplement.

Residency is a form of postgraduate advanced medical education for clinical specialties.

The studying at residency is carried out in order to provide the healthcare industry with qualified personnel.

The criterion for completion of the residency educational process is the development of the curriculum in the amount of 140 credits.

The development of a residency educational program is a prerequisite for accession to clinical practice of citizens who have received higher medical education in clinical specialties, the list of which is approved by the Order of the Minister of healthcare of the Republic of Kazakhstan dated January 30, 2008 No. 27 "On approval of Lists of clinical specialties in internship and residency".

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[4] Law of the Republic of Kazakhstan No. 319-III of July 27, 2007 "About education" / / Article 35, paragraph 3 (as amended from 04.07.2018 No. 171-VI)

[5] About the approval of the State compulsory educational standards of all cycles of education. // Order No. 604 of the Minister of education and science of the Republic of Kazakhstan dated October 31, 2018. Registered with the Ministry of justice of the Republic of Kazakhstan on November 1, 2018, no. 17669.

Training in residency is carried out in accordance with state educational standards of the residency for medical specialties, the standard professional educational program for medical specialties and the residency standard curriculum for the medical specialties approved by the Order of the acting Minister of healthcare and social development of the Republic of Kazakhstan dated July 31, 2015 No. 647 (registered in the Register of state registration of normative legal acts of the Republic of Kazakhstan dated September, 2 2015, No. 12007).

The State educational order for training at Master's and residency is approved by the Decree of the Government of the Republic of Kazakhstan and is placed in the educational and scientific organizations that implement educational programs of postgraduate education and have passed specialized (program) accreditation.

1.3.3 The Third cycle programmes (PhD).

PhD is aimed at training personnel for scientific, pedagogical and (or) professional activities with the degree award of a doctor of philosophy (PhD) (specialized doctor) with the mandatory development of at least 180 academic credits[6].

Doctoral studies are carried out only full-time within the framework of the state order approved by the Ministry of education and science of the Republic of Kazakhstan and on a piad basis.

The full transition to PhD studying has been carried out since 2010 (in the experimental mode since 2005 - in some universities).

The PhD program replaced the previously existing "candidate-doctor of science" system.

It should be noted that the degree of doctor of philosophy (PhD)/specialized doctor is awarded by the decision of the Committee on control in education and science of MES RK on the basis of application of the HEI Dissertation Council.

Since 2019, within the framework of academic freedom, the degree of doctor of philosophy (PhD)/specialized doctor is independently awarded by Dissertation councils at national universities with a special status. The state Diploma with a supplement (transcript) is issued.

Those who have received a PhD degree can complete a postdoctoral program to deepen their scientific knowledge and solve scientific and applied problems on a specialized topic.

Duration of the PhD program, depending on the specialization and previous training, is at least 3 years[7].

1.4 The Kazakhstan quality assurance system

In the Republic of Kazakhstan, there is an integral multi-level National system for assessing the quality of education (NSAQE), created in accordance with State programs for the development of education[8].

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[6] About the approval of the state compulsory educational standards of all cycles of education.//Order No. 604 of the Minister of education and science of the Republic of Kazakhstan dated October 31, 2018. Registered with the Ministry of justice of the Republic of Kazakhstan dated November 1, 2018, no. 17669.

[7] About the approval of the state compulsory educational standards of education of all cycles of education. // Order No. 604 of the Minister of education and science of the Republic of Kazakhstan dated October 31, 2018. Registered with the Ministry of justice of the Republic of Kazakhstan dated November 1, 2018, no. 17669.

The main tasks set for the National system of education quality assurance are:

- institutional assessment of the quality of education;
- external assessment of students' academic achievements;
- system and comparative analysis of the quality of educational services;
- getting objective information about the state of the education system;
- monitoring of students' academic achievements;
- providing motivation for participants of the educational system to continue learning and improve the quality of education;
- development of indicators for the development of education in Kazakhstan;
- development of a strategy for the development of the education system in Kazakhstan.

The administrative body that performs the functions of state control over the quality of education is the authorized body in the field of education – the Ministry of education and science.

A national accreditation model has been formed, which is based on the principles of independence, voluntariness and payment. Types of accreditation: institutional accreditation - accreditation of educational organizations; specialized accreditation - accreditation of educational programs; national accreditation; international accreditation[9].

In Kazakhstan, as in many countries around the world, the quality assurance system includes three levels: internal quality assurance, external quality assurance, and standards for external quality assurance agencies.

In accordance with the Standard Rules of activities of educational institutions, implementing educational programs of higher and (or) postgraduate education, approved by order of Minister of education and science of the Republic of Kazakhstan dated October 30, 2018 No. 595 universities should establish a system of internal quality assurance based on international Standards and guidelines for quality assurance of higher and postgraduate education in the European Higher Education Area – ESG. At the same time, paragraph 36 of these Rules provides a complete list of the internal standards:

1) quality assurance policy;
2) development and approval of programs;
3) student-centered learning, teaching, and evaluation;
4) admission of students, academic performance, recognition and certification;
5) teaching staff;
6) learning resources and student support system;
7) information management;
8) public awareness;

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[8] Decree of the President of the Republic of Kazakhstan No. 1118 dated December 7, 2010. Expired by Decree of the President of the Republic of Kazakhstan dated March 1, 2016 No. 205 on approval of the State program for the development of education of the Republic of Kazakhstan for 2011-2020

[9] The Order of the Minister of education and science of the Republic of Kazakhstan dated November 1, 2016 No. 629 "On approval of Rules for recognition of accreditation bodies, including foreign ones, and formation of registers of recognized accreditation bodies, accredited educational organizations and educational programs" / Footnote. Title of the Rules in the wording of the Order of the Minister of education and science of the Republic of Kazakhstan dated 04.10.2018 No. 531

9) continuous monitoring and periodic evaluation of programs;

10) periodic external evaluation.

Internal quality assurance policies and standards are developed by universities themselves.

External quality assurance is carried out through the accreditation procedure of the educational organization and (or) educational programs. It is carried out by accreditation agencies that have the status of a legal entity in the organizational and legal form of a non-profit organization.

Accreditation agencies independently develop accreditation criteria and standards based on international requirements. Institutional and specialized accreditation standards must meet the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG)[10].

The Ministry of education and science of the Republic of Kazakhstan has developed requirements for the accreditation body, the main of which is to enter the registers and (or) associations of accreditation bodies of the OECD member states[11]. In other words, this is the third level of the quality assurance system. This level is at the initial stage of its formation, and requirements have been developed for accreditation bodies whose accreditation is officially recognized in the country.

However, the standards and guidelines for external quality assurance agencies are not yet available. This work will be carried out in the future by the transformed Committee for quality assurance in the field of education and science of the MES of Kazakhstan.

Three registers are being formed by the Ministry of education and science:

1.Register of agencies that have the right to conduct accreditation of educational organizations on the territory of the Republic of Kazakhstan

2. Register of accredited educational organizations

3. Register of accredited educational programs.

Currently, the Register 1 includes 11 accreditation agencies: 7 Kazakhstani (IAAR, IQAA, KAZSEE, ARQA, ECAQA, ACBSP, Independent Kazakhstani Center of Accreditation) and 4 foreign agencies from Europe (FIBAA, ASIIN, MusiQuE, ACQUIN).

Kazakhstan agencies - The Independent Agency for Accreditation and Rating (IAAR), The Independent Agency for Quality Assurance in Education (IQAA) have full membership in The European Association for Quality Assurance in Higher Eduction (ENQA).

[10] The Standards and guidelines for quality assurance in the European Higher Education Area (ECG) / Approved by the Cabinet of Ministers in Yerevan, 2015

[11] The Order of the Minister of education and science of the Republic of Kazakhstan dated November 1, 2016 No. 629 "On approval of Rules for recognition of accreditation bodies, including foreign ones, and formation of registers of recognized accreditation bodies, accredited educational organizations and educational programs" / Footnote. Title of the Rules in the wording of the Order of the Minister of education and science of the Republic of Kazakhstan dated 04.10.2018 No. 531

2 The National Qualifications Frameworks development

A lot of work has been done in Kazakhstan to implement the National qualifications system, which includes the The National Classification of Learning Activities, the National qualifications framework, the Sectoral qualifications framework, and professional standards (Fig.1). The educational programs are developed jointly with employers. One of the key components of the NQS implementation is the implementation of the National qualifications framework.

In general, the necessity to develop and implement national qualification systems is driven not only by the desire to streamline and structure the levels of qualifications, but more by the desire to reduce the qualitative gap between the demand of the labor market and the supply of education systems. In this regard, one of the main tools that ensure the practical orientation of the educational process and close interaction between the education sector and the labor market is "learning outcomes". Currently, learning outcomes are widely used by EHEA countries in the development of educational programs and for quality assurance. The learning outcomes allow you to form competencies and structure them in the qualifications framework.

The qualifications framework is understood in the international community as a systematic and level-structured description of qualifications. The qualifications framework measures and correlates learning outcomes and establishes the ratio of diplomas and certificates of education to the relevant qualification levels.

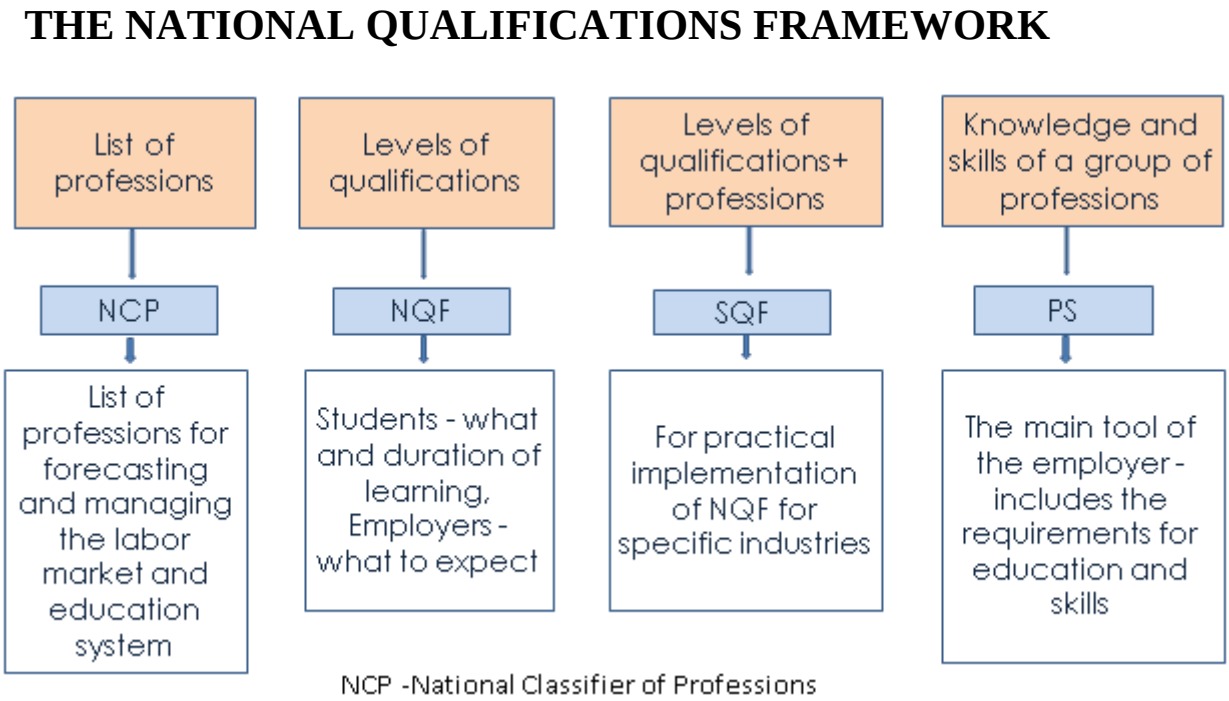

Figure 1. The Structure of the National qualifications system of the Republic of Kazakhstan

The mechanism of interaction between bodies and organizations is shown in Figure 2.

The qualifications framework allows you to compare qualifications and diplomas issued in different countries, which is relevant for labor and educational migration.

Kazakhstan was among the first post-Soviet countries to adopt the National qualifications framework in 2012. The National qualifications framework of Kazakhstan as well as the European Qualifications framework contains 8 levels, which creates the basic conditions for the integration of Kazakhstan's education and labor market into the European space. A key aspect of developing and improving the national qualifications framework and the qualifications system as a whole is the involvement of all stakeholders

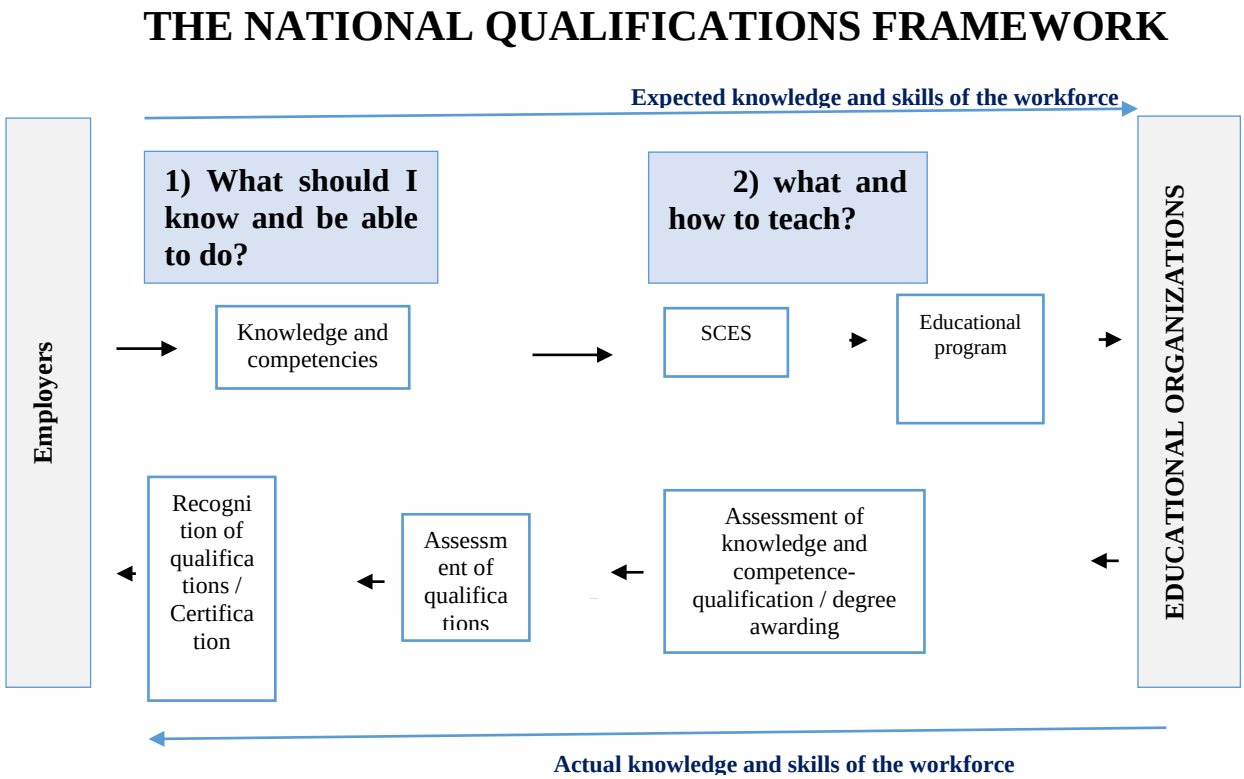

Figure 2. Interaction of the labor market and the education system through the NQF

The work on the development of the National qualification system of Kazakhstan is also underway in the framework of the partnership agreement between the Government of the Republic of Kazakhstan and the International Bank for Reconstruction and Development project "Development of labor skills and promoting job places"

To overcome the existing fragmentation in the certification system, the Labor code of the Republic of Kazakhstan provides for a new mechanism from January 1, 2021 by introducing the concept of a regulated profession as a professional activity that requires confirmation of compatibility and qualification. According to which the compatibility confirmation and qualifications awarding for regulated professions are carried out by organizations accredited in accordance with the legislation of the Republic of Kazakhstan. In this case, the procedure for confirming and awarding for regulated professions is determined by the authorized state bodies of the relevant fields of activity. The development and revision of the list (register) of regulated professions is carried out by the authorized state body for labor together with the authorized state

bodies of the relevant fields of activity and is approved by the Republican Tripartite Commission on social partnership and regulation of social and labor relations. One of the pilot projects in the field of education was National qualification test (NQT) for secondary school teachers on the basis of the professional standard "Teacher". As a result of passing the NQT, teachers receive salary allowances.

A further significant shift in the implementation of the principles of lifelong learning through the NQS is the introduction of a new mechanism for taking into account the results of non-formal education in the Law "About education" in 2018, through the approval of the Rules for recognizing learning results obtained by adults through non-formal education provided by organizations included in the list of recognized organizations providing non-formal education, as well as determining the procedure for recognizing organizations providing non-formal education and forming a list of recognized organizations, providing non-formal education, where the following concepts are disclosed and further defined:

- formal education - a type of education carried out by educational organizations that have a license to conduct educational activities on educational programs of technical and professional education, as well as higher and postgraduate education, and is accompanied by the issuance of a document confirming the learning outcomes;
- non-formal adult education - a type of education provided by organizations that provide educational services that do not take into account the place, time and form of learning, and is accompanied by the issuance of a document confirming the learning outcomes;
- recognition of organizations that provide non-formal education - procedure for confirming the authority of organizations that provide educational services for non-formal education;
- list of recognized organizations providing non-formal education - a list of national and foreign organizations providing non-formal education formed by the authorized body in the field of education;

It is expected that the full implementation of these two mechanisms will allow creating a system of qualifications that is focused on the needs of employers, ensuring appropriate monitoring of certification processes, development of professional standards and qualification categories, according to international experience (Germany, Japan, USA, etc.).

Main documents regulating the National Qualifications System:

- The Labor code of the Republic of Kazakhstan No. 414-V dated November 23, 2015
- The Law of the Republic of Kazakhstan No. 319-III of July 27, 2007 “About education”
- The Law of the Republic of Kazakhstan on the National chamber of entrepreneurs No. 129 – V dated July 4, 2013
- The Regulations on the Ministry of labor and social protection of the population of the Republic of Kazakhstan
- The Regulations on the Ministry of education and science of the Republic of Kazakhstan

- The Rules for the development, implementation, replacement and revision of professional standards (order No. 1035 of the Ministry of healthcare and social protection of the Republic of Kazakhstan dated December 28, 2018)
- The National qualifications framework of the Republic of Kazakhstan (NQF) (Protocol of the Republican Trilateral Commission No. 1 dated March 16, 2016)
- The Guidelines for the development and design of Sectoral qualifications frameworks (order No. 25 of the MLSPP of the Republic of Kazakhstan dated January 18, 2019)
- The Guidelines for the development and design of professional standards (order of the MLSPP of the Republic of Kazakhstan dated March 26, 2018)
- The National classification of LA (order No. 130-od of the Committee of technical regulation and metrology of the Ministry of industry and infrastructural development of the Republic of Kazakhstan dated May 11, 2017), entered into force on January 1, 2018
- The General Classification of economic activities (order of the Committee of technical regulation and metrology of the Ministry of industry and infrastructural development of the Republic of Kazakhstan No. 683-od dated December 14, 2007).

2.1. The progress on the National Qualifications Frameworks

The National Qualifications Framework is an integral part of the National qualification system. The Plan for the staged development of the National Qualifications System was approved by the Government of the Republic of Kazakhstan resolution No. 616 dated June 18, 2013[12]. The Plan was for 2013-2015 and included a set of measures to develop the system of qualifications, develop professional standards and assess professional readiness and confirm compatibility with the qualifications of specialists.

The aim of the Plan was to create conditions for the development of the National qualifications system.

The objectives of the Plan included:

1. Ordering and bringing into a single system the existing professions, positions, and qualifications in accordance with the requirements for the labor functions of modern production.
2. Increasing motivation and building optimal trajectories of learning and career growth of citizens.
3. Streamlining the wage system and encouraging career growth of employees.
4. Development of a lifelong learning system as the main mechanism for the formation of a knowledge-based society.
5. Development of a system of independent and objective assessment of professional readiness and confirmation of compatibility with the qualification of specialists.

[12] The Plan for the staged development of the National Qualifications System https://online.zakon.kz/Document/?doc_id=31408518&#pos=108;-57

2.2 The stages of the NQF development

The First stage

The National Qualifications framework was developed by an interdepartmental group and approved by Joint order No. 373 of the Minister of labor and social protection of population of the Republic of Kazakhstan dated September 24, 2012 and No. 444 of the Minister of education and science of the Republic of Kazakhstan dated September 28, 2012 .

The recommendations of the Working group on the Bologna process and the advice of foreign experts were used in the development of the National qualifications framework.

The first version of NQF was sent to Stephen Adam, an expert on the Bologna process from the UK. His report contained the first comments that influenced the modernization of NQF in the following years.

By order of the Minister of education and science of the Republic of Kazakhstan dated March 28, 2013, the composition of the interdepartmental working group on self-certification was approved. The group was instructed to develop an Action plan for self-certification by may 25, 2013.

The working group on self-certification included representatives of the Ministry and other state bodies, subordinate organizations and universities.

The preparing work on the Report on the self-certification of the National Qualifications Framework began in 2013. In total, more than 70 events were held to discuss NQF.

On September 19, 2013, the Department of higher and postgraduate education together with the the Bologna process and academic mobility Center held an international conference "Self-certification of the National Qualifications Framework of Kazakhstan in the context of social modernization" with the participation of international experts in the field of education.

The purpose of the conference was to exchange experience with the EHEA countries on the process of self-certification and strategic development of the qualifications framework, as well as to develop recommendations for the further development of the national qualifications framework in Kazakhstan.

The conference included:

- discussion of the main directions of implementation of the National qualifications framework in Kazakhstan
- defining priorities for the development of the national qualification system of Kazakhstan in the framework of the Bologna process
- coverage of the main provisions of verification and self-certification of the qualification framework in Kazakhstan
- development of recommendations for the implementation of a mechanism for assessing the quality of professional learning and confirming compatibility with the qualifications of specialists
- development of recommendations for the development of a lifelong learning system as the main mechanism for the formation of a knowledge-based society

- development of recommendations for the development of a system of independent assessment of professional readiness and confirmation of compatibility with the qualifications of specialists
- informing universities about the formation of the national qualification system and the implementation of the qualification framework.

Also, in order to bring the labor market and education closer together, the Republican seminar was held on June 8-9, 2015 on the theme "National qualifications framework: from architecture methodology to application practice" for higher education institutions. The organizers were the Ministry of education and science of the Republic of Kazakhstan together with the National office of the Erasmus+ program in Kazakhstan. Foreign expert Braun Maguire, Director of QA, QQI, Ireland, took part in the Republican seminar and acted as a key speaker.

As part of this event, master classes were held by members of National Team of Higher education reform experts (HEREs) in Kazakhstan.

During the Republican seminar, priority areas of higher education modernization, exchange of innovative approaches to providing educational activities, development of qualification frameworks and professional standards in accordance with modern European approaches were discussed.

The Ministry of education and science of the Republic of Kazakhstan with the support of the Bologna process and academic mobility Center conducted:

- Summer schools "Structural reforms in higher education and tools of the Bologna process" (2013), "Education Management: university management" (2015);
- Annual Republican training seminar "Academic mobility: application and development of tools" (2013-2015);
- Conference on quality assurance in higher education (2013);
- Conference on self-certification of NQF (2013);
- Conference on internationalization of higher education in Kazakhstan (2013);
- Conference within the framework of the co-chairmanship of the Republic of Kazakhstan in the Bologna process (2014);
- Seminars on learning outcomes and modular educational programs; on the social significance and accessibility of education in Kazakhstan; on the methodology for developing joint educational programs (2013-2014); "Mechanisms for the internationalization of higher education: academic mobility, joint educational programs and international cooperation" (2016), "Problems of implementing ECTS in the educational process" (2016).

In addition, Kazakhstan participated in the implementation of the EU project "Central Asian education platform". The aim of the project is to expand cooperation between the European Union and Central Asia, improve regional cooperation between Central Asian countries, and promote reforms in both higher education and technical and vocational education.

Within the framework of this project, a number of activities were also carried out to support the development of the National qualifications framework in the Republic of Kazakhstan. Experts from technical and professional education, higher and postgraduate education, representatives of employers and other stakeholders were invited to participate in seminars and conferences.

A workshop on the National qualifications framework was held on 5 December 2016. It was attended by foreign experts: Baiba Ramina, Director of the Academic Information Center of Latvia; Claudio Dondi, CAEP expert on education and training; Eva Khmelecka, Institute of Educational research, Poland; Christian Wagner, head of the Central Asian education platform.

It was discussed:

- Improvement of the National qualification system of Kazakhstan;
- International experience in developing national, sectoral qualifications frameworks and professional standards;
- Process of self-certification of the National Qualifications Framework of Kazakhstan with the European Qualifications Framework and the overarching EHEA Qualifications Framework.

Kazakhstan also took part in the following events within the framework of the project:

- Regional conference "Strengthening cooperation in higher education between Central Asian countries and the European Union", Krakow, 16-18 November 2016;
- first meeting of the Peer learning group on NQF in Istanbul, February 2017;
- second meeting of the group, Bishkek, April 2017;
- seminar on quality assurance and accreditation, Dushanbe, May 2017.

Kazakhstan, as a participant in the Bologna process, participates in meetings of BFUG, BFUG working groups, and Ministers' conferences of EHEA countries that are dedicated to NQF.

NQF issues were also discussed at various meetings of educational and methodological associations at universities.

For a number of objective reasons, the Self-certification Report was not prepared at this stage.

The Second stage

In 2017, the Department of higher and postgraduate education of MES commissioned BPAMC to study the materials of the carried-out work and prepare a draft report on the self-certification. As a result, a draft report using the descriptors of the 6,7,8 NQF levels was prepared and sent for examination to foreign experts: Eva Khmelecka from Poland and Volkler Gemlich from Germany. Foreign experts made a number of fundamental comments and drew attention to the discrepancy between the descriptors of the 6-8 levels and the Dublin descriptors. Main remarks:

1.Level descriptors are not formulated in the form of learning outcomes that the graduate has.

2.The progress of descriptors from level to level is not tracked, and is not designed accordingly.

3.The emphasis in the descriptors of professional activities.

It became obvious that a radical revision of the NQF descriptors was required.

The Third stage

An analysis conducted in 2018 by Ernst&Young also showed that the National qualifications framework needs to be revised. They developed a new concept and

roadmap for the modernization of NQF until 2025 and recommended the creation of a special state body for qualifications under the Government.

In July 2019, for the first time, the Government created the National Council for qualifications and, most importantly, a permanent working body - the Project office for the development of the social and labor sphere. A Roadmap for the implementation of the National qualifications system in Kazakhstan until 2025 has been developed. The main task of the Council is to develop proposals for the development of the main directions for the development of the National qualifications system to strengthen the link between the labor market and the training system, as well as the creation and development of a system of certification and recognition of qualifications.

The Ministry of education and science of Kazakhstan, taking into account the recommendations of the Paris conference for acceleration of implementation of self-certification of national qualifications frameworks and the disparity between the descriptors of levels 6-8 with descriptors of the Bologna framework, took the decision to develop a separate National qualifications framework for higher education – HE-NQF.

By order No. 152 dated 17.04.2019, a new interdepartmental working group was created, which included representatives of the Ministry of education and science, the Ministry of labor and social protection of the population, the National chamber of entrepreneurs "Atameken", industry associations and higher education institutions (Annex 3).

This working group has developed a separate National qualifications framework for higher education, which allows classify qualifications obtained in higher and postgraduate education, and is compatable to the Overarching Qualifications framework for the European Higher Education Area.

HE-NQF project was presented at the meeting of Working group A on self-certification in Prague (June 3, 2019). On 21 October 2019, HE-NQF was presented to an expert from Germany, Volkner Gemlich.

On November 27, 2019, NQF was reviewed and approved at the meeting of the industry commission of the MES RK on social partnership and regulation of social and labor relations in the field of education and science.

2.3 The Self-certification of the HE-NQF with QF-EHEA

The confirmation of compatibility of the National qualifications framework for higher education of the Republic of Kazakhstan with the EHEA qualifications Framework is presented in this report.

The accessibility of information

The implementation of the National qualifications framework involves the creation of a Register of qualifications and a portal to provide the most complete and accessible information about the qualifications system in the Republic of Kazakhstan.

At the moment, the tab with updates on the National qualifications system is available on the website of the National Chamber of entrepreneurs "Atameken": http://palata.kz/ru/services/16-professional-nye-standarty.

"Atameken" provides information support for other components of the NQS - sectoral qualifications framework and professional standards. The site contains guidelines for the development of SQF and professional standards, analytical materials, registers of approved SQF and professional standards.

3. The compatibility of descriptors of HE-NQF and QF-EHEA

The following documents were used in the development of NQF descriptors:

- Dublin descriptors developed as part of the Bologna process;
- Bloom taxonomy - a hierarchical system of six levels of knowledge based on the ideas of the American psychologist Benjamin Bloom and his colleagues;
- Recommendations of the Council of the European Union dated 22 may 2017 on the European qualifications framework for lifelong learning.

Higher and postgraduate education in Kazakhstan belongs to 6-8 levels of NQF.

The fifth level is not included in the higher education system, so this report does not considered it (Fig.3).

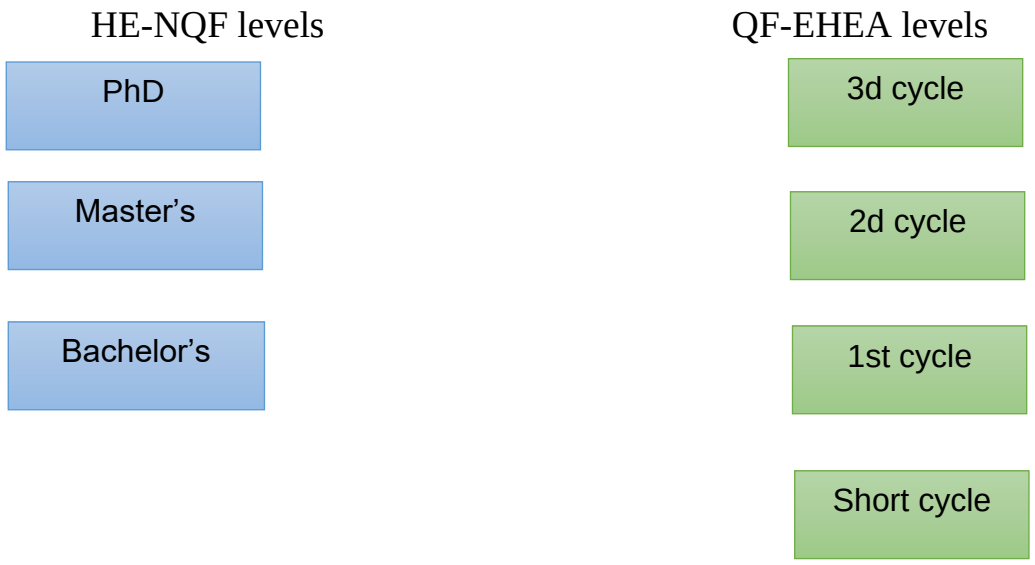

Figure 3. Compatibility of HE-NQF levels with QF-EHEA

HE-NQF descriptors are divided into categories (knowledge, skills, responsibility, and autonomy) and levels.

Tables 2,3,4 demonstrate how HE-NQF descriptors are compatible to those of QF-EHEA.

Table 2. Compatibility of descriptors HE-NQF with the QF-EHEA descriptors (the first cycle)

	HE-NQF descriptors Graduates completed the cycle	**QF-EHEA descriptors** Qualifications that signify completion of the first cycle are awarded to students who:	**Credits**
knowledge	demonstrated - knowledge and understanding of facts, phenomena, theories and complex dependences between them in the field of study; - knowledge and understanding of research methods in the field of study; - knowledge of legal, social and cultural norms at the interpersonal interaction and professional activity.	have demonstrated knowledge and understanding in a field of study that builds upon their general secondary education, and is typically at a level that, whilst supported by advanced textbooks, includes some aspects that will be informed by knowledge of the forefront of their field of study; can apply their knowledge and understanding in a manner that indicates a professional approach to their work or vocation, and have competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study; have the ability to gather and interpret relevant data (usually within their field of study) to inform judgments that include reflection on relevant social, scientific or ethical issues; can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences; have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy.	240
skills	are able to - apply theoretical and practical knowledge to address learning, practical and professional issues in the field of study; - carry out selection and interpretation of significant data to pass judgment on social, scientific and ethical issues; - create a product in the professional field on the basis of modern knowledge and best practices.		
responsibility and autonomy	are ready to - enter into interaction in social, academic and professional field to discuss current issues; - independently develop, agree, make decisions of professional and social issues and be responsible for them; - critically evaluate one's own knowledge and behavior for further personal and professional development; - form one's own social self-identification to value perception of society, country and international community; - be able to continue education with a significant level of autonomy.		

Table 3. Compatibility of descriptors HE-NQF with the QF-EHEA descriptors (the second cycle)

	HE-NQF descriptors Graduates completed the cycle	**QF-EHEA descriptors** Qualifications that signify completion of the second cycle are awarded to students who:	**Credits**
knowledge	demonstrated - knowledge of new and latest scientific concepts and theories to solve issues occurred in the field of study and interdisciplinary context; - knowledge of research methodology in the field of study; - design-thinking	• have demonstrated knowledge and understanding that is founded upon and extends and/or enhances that typically associated with the first cycle, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context; • can apply their knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study; • have the ability to integrate knowledge and handle complexity, and formulate judgments with incomplete or limited information, but that include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgments; • can communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences clearly and unambiguously; • have the learning skills to allow them to continue to study in a manner that may be largely self-directed or autonomous.	120/140 (60/90)
skills	are able to - apply theoretical and practical knowledge to address complex non-standard scientific, social and ethical issues in the interdisciplinary context; - critically evaluate the latest developments in the scientific and professional field of study, consider an opportunity of their application in the context of the conducted researches; - make decisions in new and unfamiliar contexts on the basis of synthesis and integration of scientific knowledge and methodology; - carry out own scientific researches in the context of the latest theories, methodology and technology for creation innovative product.		
responsibility and autonomy	are ready to - generate concepts and independently make effective decisions and optimal solutions in non-standard situation; - assume civil liability for the received scientific results and their social/economic effect; - inform on results to experts and non-experts, argue it at the scientific debates; - be able to work in team and perform corporate management; - critically evaluate own knowledge and actions, be able to continue education with high level of autonomy.		

Table 4. Compatibility of descriptors HE-NQF with the QF-EHEA descriptors (the third cycle)

	HE-NQF descriptors Graduates completed the cycle	**QF-EHEA descriptors** Qualifications that signify completion of the third cycle are awarded to students who:	**Credits**
knowledge	demonstrated - profound systemic knowledge, vision of current problems in the field of study and interdisciplinary context; - orientation in a variety of methodological and technological ways to address the essential tasks in the field of research and (or) innovations.	• have demonstrated a systematic understanding of a field of study and mastery of the skills and methods of research associated with that field; • have demonstrated the ability to conceive, design, implement and adapt a substantial process of research with scholarly integrity; • have made a contribution through original research that extends the frontier of knowledge by developing a substantial body of work, some of which merits national or international refereed publication; • are capable of critical analysis, evaluation and synthesis of new and complex ideas; • can communicate with their peers, the larger scholarly community and with society in general about their areas of expertise; • can be expected to be able to promote, within academic and professional contexts, technological, social or cultural advancement in a knowledge based society.	180
skills	are able to - carry out ingenious researches contributing to the scientific field and extending its boundaries; - substantiate the urgency of the problem, structure its research with a scientific integrity; - generate new knowledge in the form justified and reliable results of doctoral research; - develop innovative programs of sectorial and interdisciplinary researches on the basis of synthesis of new and the latest concepts, research approaches, challenges.		
responsibility and autonomy	are ready to - critically analyze, evaluate and synthesize new and complex scientific concepts and provide management of their realization; - represent own position with arguments in the scientific publications and discussions to the representatives of the scientific community; - facilitate within academic and professional contexts to the technological, social, cultural development of region and country; - find optimal solutions in complex, non-standard situations; - demonstrate autonomy, scientific and professional perfection and commitment to creation of new concepts.		

4. The Analysis of the National Qualifications Framework for higher education: compliance with criteria and self-certification procedures with QF-EHEA

4.1 The compatibility criteria of HE-NQF with QF-EHEA

Criterion 1. *The National qualifications framework for higher education and the body / bodies responsible for its development are determined by the national Ministry responsible for higher education.*

The National qualifications framework was developed by an interdepartmental group and approved at the meeting of the industry Commission of the MES of Kazakhstan on social partnership and regulation of social and labor relations in the field of education and science on November 27, 2019 No. 27.

The recommendations of the working group on the Bologna process and the advice of foreign experts were used in the development of the National qualifications framework.

Criterion 2. *There is a clear and obvious link between qualifications in the National framework and qualification descriptors in the European qualifications framework.*

The levels of the National qualifications framework for higher education and their descriptors correspond to 1-3 cycles of the EHEA qualifications framework. The analysis of level compatibility is presented in Chapter 3.

Criterion 3. *The national framework and qualifications are based on learning outcomes, qualifications are linked to ECTS credits or an ECTS-compatible system.*

The Rules for the organization of the educational process on credit technology of education dated April 20, 2011 No. 152 (as amended on October 12, 2018) provide that universities develop educational programs based on learning outcomes in all cycles. It is determined that the workload of 1 Kazakhstan academic credit (30 academic hours) corresponds to 1 ECTS credit.

As of 2019, all civil universities use the credit system of education for all 3 cycles - Bachelor's, Master's and PhD.

Criterion 4. *The procedures for including qualifications in the National framework are transparent.*

The qualifications of technical and professional, postsecondary education are included in the Classifier of specialties and qualifications for technical and vocational, post-secondary education, approved by order of the Minister of education and science of the Republic of Kazakhstan dated September 27, 2018 no. 500.

As for higher and postgraduate education, on March 20, 2009, it was approved and put into effect **the Classifier of specialties of higher and postgraduate education of the Republic of Kazakhstan** by the Order No. 131-od of the Committee for technical regulation and metrology of the Ministry of industry and

trade of the Republic of Kazakhstan. However, the inclusion of new qualifications in this classifier was complicated by a number of administrative procedures.

In this regard, in order to remove administrative barriers and increase the transparency of the process of introducing new qualifications, **the Classifier of training fields for higher and postgraduate education** was introduced in October 2018 (order No. 569 of the Minister of education and science of the Republic of Kazakhstan dated October 13, 2018). Now the qualifications of higher and postgraduate education are determined by the educational programs included in the Register of Educational Programs.

According to the amendments to the Law of the Republic of Kazakhstan "About education" dated July 4, 2018, the development and approval of educational programs of higher and postgraduate education is carried out by universities independently in accordance with the state compulsory educational standards. All educational programs are included into the Register of educational programs. And the program inclusion procedure of the Register is transparent and is carried out through the educational portal of the Unified system of management of higher education (USMHE).

The Classifier was developed in order to:

- create a system of higher and postgraduate education that is open to society and every citizen, according to a classification that reflects all types and spheres of activity;
- create a regulatory framework for the development of state compulsory standards for higher and postgraduate education;
- promote the improvement of the quality and development of education in accordance with the achievements of science, technology and culture with the needs of the labor market and the population;
- create conditions for the formation of an interstate educational space;
- promote the development and implementation of unified educational technologies in a variety of professions, occupations and activities;
- create conditions for calculating the needs of all sectors of the economy of the Republic for specialists with higher and postgraduate education and forming a justified state educational order for their studying;
- provide statistical accounting and analysis in the field of higher and postgraduate education in connection with demand and supply in the labor market in accordance with the Classification of courses.

The objects of classification are qualifications and academic degrees at the levels of education that are used to train personnel in the educational and scientific organizations that provide higher and postgraduate education, regardless of ownership and departmental subordination.

The obtained qualifications are included in the sectoral qualifications framework (SQF). The development and revision of SQF is carried out by the authorized state bodies and associations of employers of the relevant fields and approved by the industry commissions for social partnership and regulation of social and labor relations.

At the same time, SQF project developed by state bodies and employers' associations is discussed in the professional community (associations of employers and employees, Industry councils) and is being finalized taking into account the results of the discussion.

The SQF is coordinated with employers 'and employees' associations, Industry councils (with interested state bodies, if necessary) and submitted for approval to the authorized state body.

Criterion 5. *The National quality assurance system of higher education linked to the National qualifications framework and in line with the Berlin communiqué and any subsequent communiqué adopted by the Ministers within the Bologna process.*

Kazakhstan has developed a comprehensive, multi-level national system for assessing the quality of education, which includes external and internal control of the quality of education. Since 2011, the functions of assessing the quality of education in Kazakhstan have been transferred to an independent environment. In this regard, the independent accreditation procedure is carried out in accordance with the standards of institutional and specialized accreditation agreed with the European Standards and Guidelines for Quality Assurance (ESG). Currently, Kazakhstan accreditation bodies have made changes to their existing accreditation standards in accordance with the new version of ESG.

There are the Rules of recognition of accreditation bodies, including foreign ones, and formation of the register of recognized accreditation bodies, accredited educational organizations and educational programs dated November 1, 2016 No. 629.

Criterion 6. *The National Qualifications Framework and its reference with the European framework are noted in all Diploma Supplements.*

Since 2019, in accordance with paragraphs 37 and 64 of the State compulsory standards of higher and postgraduate education, approved by the order of the Minister of education and science of the Republic of Kazakhstan dated October 31, 2018, No. 604, all universities are required in obligatory order to issue the European Diploma Supplement for free.

This document indicates the level of qualification and its place in the National qualifications framework: for bachelor's degree - 6 level of NQF/6 level of EQF; for master's degree-7 level of NQF/7 level of EQF; as well as the total load in ECTS.

Criterion 7. *The responsibilities of the involved parties with respect to the national framework are clearly defined and made public.*

According to the 2016 Labor code "the development of NQF is carried out by the ministries of labor and education, and is approved by the Republican Commission on social partnership and regulation of social and labor relations". Participants of the Republican Commission are representatives of the Government of the Republic of Kazakhstan (7 people), the Republican associations of employees (7 people) and the Republican associations of employers (7 people)».

Ministries responsible for the development and implementation of NQF are the MES and MLSPP.

The National chamber of entrepreneurs of Kazakhstan "Atameken", according to the Labor code, from 1 January 2016, appoves the professional standards developed by industry associations of employers.

NQF as well as regulatory documents and guidelines for the development and approval of professional standards, a list of approved sectoral qualification frameworks, projects and initiative projects of professional standards, the approved professional standards, the Register of professional standards, and the Register of certification centers are available on the website of "Atameken" (http://palata.kz/ru/services/16-professional-nye-standarty).

The Register of educational programs is available on the website of the Bologna process and academic mobility Center (https://enic-kazakhstan.kz/)

4.2 The Procedures for verifying the compatibilty of the National Qualifications Framework with the EHEA Qualifications Framework

The Procedures for verifying the compatibilty of the National Qualifications Framework with the EHEA Qualifications Framework were discussed at the meeting of the working group on qualification structures in Bergen in 2005 and adopted at the meeting of Ministers of higher education in London in 2007.

Procedure 1. *The competent national body/bodies shall self-certify the compatibility of the national framework with the European framework.*

Accepting the recommendation of the Working group on the NQF self-certification the MES RK has recognized the compatibility of HE-NQF with QF-EHEA. This decision is confirmed by the minutes of the meeting of the Industry Commission on social partnership and regulation of social and labor relations in the field of education and science of the Republic of Kazakhstan (dated November 27, 2019, Annex 7).

Procedure 2. *The self-certification process shall include the stated agreement of the quality assurance bodies of the country in question recognised through the Bologna Process.*

Kazakhstan agencies - the Independent Agency for Accreditation and Rating (IAAR) and The Independent Agency for Quality Assurance in Education (IQAA) have full membership in ENQA.

The Agencies use the 2015 European Standards and Guidelines for Quality Assurance (ESG).

In general, Kazakhstan's education system meets ESG requirements. All Kazakhstan universities undergo self-assessment in preparation for accreditation of universities and educational programs. In most Kazakhstan universities, development strategies include measures to improve quality.

IAAR and IQAA participated in the self-certification process (in the discussion and development of the report) and officially confirm compatibility with all established requirements (Annex 8,9).

Procedure 3. *The self-certification process shall involve international experts.*

During the preparation of the report and the self-certification procedure, the following international experts assisted at several stages: Baiba Ramina, Director of the Academic Information center, Latvia; Volker Gemlich, Germany; Eva Khmeletska, Institute for Educational Research, Poland. NQF was presented at the meetings of working group A on self-certification and on ECTS of the Bologna process (co-chairs: Carita Blomqvist - Finland; Lucie Troyanova - Czech Republic)

Procedure 4. *The self-certification and the evidence supporting it shall address separately each of the criteria established and shall be published*

Data for each of the established criteria and a self-certification report are presented and published on the BPAMC website https://enic-kazakhstan.kz

Procedure 5. *The ENIC/NARIC network shall maintain a public listing of States that have completed the self-certification process*

ENIC/NARIC networks maintain a public list of States that have confirmed the completion of the self-certification process (www.enic-naric.net).

The report is available on the BPAMC website (http://enic-kazakhstan.kz).

The report submitted by BFUG will be published in the public domain and will be made available to the ENIC/NARIC network.

The report adopted by the Working group of the Bologna process will be published in the public domain, and data will be provided to the ENIC/NARIC network.

Procedure 6. *The completion of the self-certification process shall be noted on Diploma Supplements issued subsequently by showing the link between the national framework and the European framework.*

As soon as the self-certification process is completed, this information will be officially included in the Diploma Supplement.

Annex 1

The National Qualification Framework for Higher Education (HE-NQF)

Cycles	Knowledge	Skills	Responsibility and autonomy	Credits
		The Graduates, completed the cycle		
The firsr (Bachelor' s)	*demonstrated* - knowledge and understanding of facts, phenomena, theories and complex dependences between them in the field of study; - knowledge and understanding of research methods in the field of study; - knowledge of legal, social and cultural norms at the interpersonal interaction and professional activity.	*are able to* - apply theoretical and practical knowledge to address learning, practical and professional issues in the field of study; - carry out selection and interpretation of significant data to pass judgment on social, scientific and ethical issues; - create a product in the professional field on the basis of modern knowledge and best practices.	*are ready to* - enter into interaction in social, academic and professional field to discuss current issues; - independently develop, agree, make decisions of professional and social issues and be responsible for them; - critically evaluate one's own knowledge and behavior for further personal and professional development; - form one's own social self-identification to value perception of society, country and international community; - be able to continue education with a significant level of autonomy.	**240**

Second (Master' s)	*demonstrated* - knowledge of new and latest scientific concepts and theories to solve issues occurred in the field of study and interdisciplinary context; - knowledge of research methodology in the field of study; - design-thinking	*are able to* - apply theoretical and practical knowledge to address complex non-standard scientific, social and ethical issues in the interdisciplinary context; - critically evaluate the latest developments in the scientific and professional field of study, consider an opportunity of their application in the context of the conducted researches; - make decisions in new and unfamiliar contexts on the basis of synthesis and integration of scientific knowledge and methodology; - carry out own scientific researches in the context of the latest theories, methodology and technology for creation innovative product.	*are ready to* - generate concepts and independently make effective decisions and optimal solutions in non-standard situation; - assume civil liability for the received scientific results and their social/economic effect; - inform on results to experts and non-experts, argue it at the scientific debates; - be able to work in team and perform corporate management; - critically evaluate own knowledge and actions, be able to continue education with high level of autonomy.	**120 (60/90)**

Second (residency)	*demonstrated* - systemic knowledge, vision of actual problems in the field of professional activity in a multidisciplinary context; - knowledge of fundamental scientific principles of disease development and principles of scientifically-based medical practice	*are able to* - apply theoretical and practical knowledge to solve complex problems in their medical practice in an interdisciplinary context; - critically evaluate the latest achievements of medical science and practice, consider the possibility of their application in the context of their own medical activities; - to make decisions in new and unfamiliar contexts on the basis of synthesis and integration of own practical experience and available scientific evidence; - to carry out professional activities in the context of the latest theories, methodologies and technologies to effectively solve the problems of medical practice.	*are ready to* - independently make an effective and optimal decision in medical practice; - be responsible for the results of professional activities and their medical and social effects; - to report the results of professional activity to specialists and non-specialists, to defend them in scientific and professional discussions; - to be able to work in a team, to carry out intra-and interprofessional interaction; - critically evaluate one's knowledge and actions, be able to continue learning with a high degree of autonomy.	**140**

Third (PhD)	*demonstrated* - profound systemic knowledge, vision of current problems in the field of study and interdisciplinary context; - orientation in a variety of methodological and technological ways to address the essential tasks in the field of research and (or) innovations.	*are able to* - carry out ingenious researches contributing to the scientific field and extending its boundaries; - substantiate the urgency of the problem, structure its research with a scientific integrity; - generate new knowledge in the form justified and reliable results of doctoral research; - develop innovative programs of sectorial and interdisciplinary researches on the basis of synthesis of new and the latest concepts, research approaches, challenges.	*are ready to* - critically analyze, evaluate and synthesize new and complex scientific concepts and provide management of their realization; - represent own position with arguments in the scientific publications and discussions to the representatives of the scientific community; - facilitate within academic and professional contexts to the technological, social, cultural development of region and country; - find optimal solutions in complex, non-standard situations; - demonstrate autonomy, scientific and professional perfection and commitment to creation of new concepts.	**180**

Annex 2

The Compatibility of descriptors by cycles

	The first cycle	The Second cycle	The Third cycle
	Graduates demonstrated:		
Knowledge	- knowledge and understanding of facts, phenomena, theories and complex dependences between them in the field of study; - knowledge and understanding of research methods in the field of study; - knowledge of legal, social and cultural norms at the interpersonal interaction and professional activity.	- knowledge of new and latest scientific concepts and theories to solve issues occurred in the field of study and interdisciplinary context; - knowledge of research methodology in the field of study; - design-thinking	- profound systemic knowledge, vision of current problems in the field of study and interdisciplinary context; - orientation in a variety of methodological and technological ways to address the essential tasks in the field of research and (or) innovations.

	Graduates are able to		
Skills	- apply theoretical and practical knowledge to address learning, practical and professional issues in the field of study; - carry out selection and interpretation of significant data to pass judgment on social, scientific and ethical issues; - create a product in the professional field on the basis of modern knowledge and best practices.	- apply theoretical and practical knowledge to address complex non-standard scientific, social and ethical issues in the interdisciplinary context; - critically evaluate the latest developments in the scientific and professional field of study, consider an opportunity of their application in the context of the conducted researches; - make decisions in new and unfamiliar contexts on the basis of synthesis and integration of scientific knowledge and methodology; - carry out own scientific researches in the context of the latest theories, methodology and technology for creation innovative product.	- carry out ingenious researches contributing to the scientific field and extending its boundaries; - substantiate the urgency of the problem, structure its research with a scientific integrity; - generate new knowledge in the form justified and reliable results of doctoral research; - develop innovative programs of sectorial and interdisciplinary researches on the basis of synthesis of new and the latest concepts, research approaches, challenges.

	Graduates are ready to:		
Responsibility and autonomy	- enter into interaction in social, academic and professional field to discuss current issues; - independently develop, agree, make decisions of professional and social issues and be responsible for them; - critically evaluate one's own knowledge and behavior for further personal and professional development; - form one's own social self-identification to value perception of society, country and international community; - be able to continue education with a significant level of autonomy.	- generate concepts and independently make effective decisions and optimal solutions in non-standard situation; - assume civil liability for the received scientific results and their social/economic effect; - inform on results to experts and non-experts, argue it at the scientific debates; - be able to work in team and perform corporate management; - critically evaluate own knowledge and actions, be able to continue education with high level of autonomy.	- critically analyze, evaluate and synthesize new and complex scientific concepts and provide management of their realization; - represent own position with arguments in the scientific publications and discussions to the representatives of the scientific community; - facilitate within academic and professional contexts to the technological, social, cultural development of region and country; - find optimal solutions in complex, non-standard situations; - demonstrate autonomy, scientific and professional perfection and commitment to creation of new concepts.
Credit	**240**	**120 (60/90)**	**180**

Annex 3

The Working group on development of the National Qualifications Framework for Higher education

№	Full name	Position
1.	Zhakypova Fatima	Vice-Minister of education and science of the Republic of Kazakhstan, Chairman
2.	Toibaev Adlet	Director of the Department of higher and postgraduate education of MES RK
3.	Narbekova Banu	Deputy Director of the Department of higher and postgraduate education of MES RK
4.	Shyrgatova Rauza	Head of Partnerships and international projects office of the Department of technical and professional education of MES RK
5.	Zhubanova Dinara	Director of the Department for development of the national system of qualifications and forecasting of MLSPP (by agreement)
6.	Zhazetova Galima	Head of the Department of labor regulation and implementation of the national qualification system (by agreement)
7.	Kultumanova Almagul	Director of the Bologna process and academic mobility Center of MES RK
8.	Nurmagambetova Amantay	Counselor of the Bologna process and academic mobility Center of MES RK
9.	Akisheva Aysulu	Chief expert of the Bologna process and academic mobility Center of MES RK
10.	Kuzenbayev Ermek	Acting Chairman of Board of NJSC “Holding “Kasipkor”
11.	Alshanov Rakhman	“Turan” university rector, President of the Association of universities of the Republic of Kazakhstan
12.	Omirbayev Serik	Rector of the North Kazakhstan state university
13.	Akhmed-Zaki Darkhan	Rector of the University of International business
14.	Dzharasova Gulzhan	Vice-rector for academic affairs of Kh. Dosmukhamedov Atyrau state university
15.	Zhetesova Gulnar	Vice-rector for academic affairs of Karagandy state technical university
16.	Kargin Sergali	Vice-rector for academic affairs of E. Buketov Karagandy state university
17.	Syrymbetova Layla	Professor of E. Buketov Karagandy state university
18.	Ekshembeeva Lyudmila	Professor of Al-farabi Kazakh national university
19.	Shonaeva Lazzat	Deputy Director of the Department of human capital development of NCE “Atameken” (by agreement)
20.	Zhumatayev Daniar	Expert of the Department of human capital development of NCE “Atameken” (by agreement)
21.	Isabekov Marat	Director of the Corporate Fund «Kazlogistics» (by agreement)
22.	Bayzhumova Alvina	Chairman of the General meeting of participants of the Association of HR managers, Umbrella company (by agreement)
23.	Uvaleev Zholaman	Executive Director of the Kazakhstan Association of IT

		companies (by agreement)
24.	Akhmurzina Lazzat	Executive Director for human capital development of the "KAZENERGY" Association (by agreement)
25.	Kazembekova Laura	Leading expert of the Department for human capital development of the "KAZENERGY" Association (by agreement)
26.	Zaitova Svetlana	President of “Kazakhstan Register” (by agreement)

Annex 4

The Examples of the learning outcomes of the first cycle on the educational program "Informatics"

NQF descriptors (6 level)	General descriptors of the first cycle of HE-NQF	SQF descriptors for Bachelor's qualification	Examples of Learning outcomes
Knowledge *Graduates demonstrated*			
A wide range of theoretical and practical knowledge in the professional field	- *knowledge and understanding of facts, phenomena, theories and complex dependences between them in the field of study;* - *knowledge and understanding of research methods in the field of study;* - *knowledge of legal, social and cultural norms at the interpersonal interaction and professional activity.*	Knowledge and understanding that go beyond and / or deepening knowledge and understanding, usually associated with the bachelor's level, which form the basis or opportunity for displaying originality in the development and / or application of ideas, often in a research context. Knowledge of the methodology of joint analysis, design and decision-making in complex professional situations, methods of communication and coordination of points of view, design and presentation of analytical and project documentation.	Upon completion of this educational program, students are expected to be able to: -Justify the choice of mathematical methods for describing, analyzing, and solving problems. -Explain the choice of basic standards, methodology and design patterns, methods, tools and programming languages, and information security tools for software design. -Explain the fundamental principles of software development, including describing programming paradigms, data structures, algorithms, and evaluating their complexity.

Skills *Graduates are able to*			
Independent development and promotion of various options for solving professional problems using theoretical and practical knowledge	- *apply theoretical and practical knowledge to address learning, practical and professional issues in the field of study;* - *carry out selection and interpretation of significant data to pass judgment on social, scientific and ethical issues;* - *create a product in the professional field on the basis of modern knowledge and best practices.*	Demonstrate knowledge and understanding in the field of study, including elements of the most advanced knowledge in the field. Demonstrate a set of skills for managing the process of work, the ability to choose methods, methodologies and evaluation criteria for obtaining results, distribute and delegate authority, form teams, and make decisions during the production process.	- Perform a comprehensive analysis of the main requirements for the user interface, configuration of hardware and software applications. - Perform software design, development, testing, debugging, and implementation. - Develop web and mobile applications with an ergonomic user interface based on a flexible methodology and network security principles, create new solutions. - Use parallel and distributed computing technologies to solve resource-intensive tasks. - Use artificial intelligence approaches and big data analysis and processing methods to solve real-world problems. - Create reliable software that meets user requirements. - Manage data, perform testing, health checks, and refactoring of program code. - Develop innovative solutions for integrating new technologies with existing applications.

Responsibility and autonomy *Graduates are ready to*			
Independent management and control of the processes of labor and educational activities within the framework of the organization's strategy, policy and goals, discussion of the problem, reasoning of conclusions and competent handling of information	- *enter into interaction in social, academic and professional field to discuss current issues;* - *independently develop, agree, make decisions of professional and social issues and be responsible for them;* - *critically evaluate one's own knowledge and behavior for further personal and professional development;* - *form one's own social self-identification to value perception of society, country and international community;* - *be able to continue education with a significant level of autonomy.*	management (installation and adjustment, production and technological, operational, service) within the company's strategy, which involves working on complex tasks, where the analysis of the situation or information requires an assessment of various factors, as well as team management; take responsibility: for the result at a specific site of the technological process; solve problems involving the choice and variety of solutions.	- Work in a team with a tolerant perception of social, ethnic and cultural differences, critically evaluate their activities, the team's activities. - To defend the working discussion, a choice of technology, methods of analysis of large databases, etc. - Communicate this information to both specialists and non-specialists. - Critically evaluate one's professional level, determine the trajectory of further self-improvement.

Annex 5

The Examples of the learning outcomes of the second cycle on the educational program "Informatics"

NQF descriptors (7 level)	General descriptors of the first cycle of HE-NQF	SQF descriptors for Bachelor's qualification	Examples of Learning outcomes
Knowledge *Graduates demonstrated*			
Conceptual knowledge in the field of science and professional activity, Creation of new applied knowledge in the professional field	- *knowledge of new and latest scientific concepts and theories to solve issues occurred in the field of study and interdisciplinary context;* - *knowledge of research methodology in the field of study;* - *design-thinking*	Knowledge of the methodology of system analysis and design of professional situations, methods of making management decisions. Knowledge of the life cycle of project activities, rules for developing software products, the main business processes of the company, the basics of personnel management, production, management, management psychology, information security issues.	Upon completion of this educational program, students are expected to be able to: -Know the principles of organizing and planning research in this scientific field; --Describe ways to evaluate the computational complexity of algorithms. - Choose software design and development methods, programming languages, and architectures, taking into account their inherent limitations.

Skills *Graduates are able to*			
Self-determination of the purpose of professional activity and choose appropriate methods and means to achieve them. Implementation of scientific and innovative activities to obtain new knowledge	*- apply theoretical and practical knowledge to address complex non-standard scientific, social and ethical issues in the interdisciplinary context;* *- critically evaluate the latest developments in the scientific and professional field of study, consider an opportunity of their application in the context of the conducted researches;* *- make decisions in new and unfamiliar contexts on the basis of synthesis and integration of scientific knowledge and methodology;* *- carry out own scientific researches in the context of the latest theories, methodology and technology for creation innovative product.*	Demonstrate knowledge and understanding that go beyond and / or developing knowledge and understanding gained at the bachelor's level that is the basis or opportunity for original development or application of ideas. Apply knowledge, understanding, and the ability to solve problems in new or unfamiliar situations and contexts within broader (or interdisciplinary) areas related to the field of study.	- Model tasks and develop new tools and applications for data collection, storage, analysis, and management. - Develop advanced network computer systems with an emphasis on reliability and security. - Perform high-performance scientific calculations, evaluate the performance of parallel computing systems. - Apply image recognition theory and machine learning methods to solve problems from various subject areas. - Restructure existing software by identifying problematic components and choosing solution strategies. - Carry out research and development in an environment focused on the final product, scientifically justify the made strategic decisions. - Analyze and critically relate to various sources of information, use them to structure and formulate reasoning. - Conduct research independently: understand current research issues, independently apply the published results or methods in a new context.

Responsibility and autonomy *Graduates are ready to*			
Defining the strategy, activity of a division or organization. Decision-making and responsibility at the division level	*- generate concepts and independently make effective decisions and optimal solutions in non-standard situation;* *- assume civil liability for the received scientific results and their social/economic effect;* *- inform on results to experts and non-experts, argue it at the scientific debates;* *- be able to work in team and perform corporate management;* *- critically evaluate own knowledge and actions, be able to continue education with high level of autonomy.*	Independently carry out: management (installation and commissioning, production and technological, operational, service) that involves working on complex tasks, where the analysis of the situation or information requires an assessment of various factors, as well as team management. Take responsibility: for the result on a specific site in a structured environment. Solve complex development problems, develop new approaches, using a variety of methods.	- Lead the research team: evaluate the necessary funds, separate tasks, plan the time of task completion, and provide reports. - Defend the results of the research in a reasoned manner during the discussion and defense of the dissertation. -Make realized decisions in matters of evaluation of social, professional and scientific problems.

Annex 6

The Examples of the learning outcomes of the third cycle on the educational program "Informatics"

NQF descriptors (8 level)	General descriptors of the first cycle of HE-NQF	SQF descriptors for Bachelor's qualification	Examples of Learning outcomes
Knowledge *Graduates demonstrated*			
Methodological knowledge in the field of innovative professional activity	- *profound systemic knowledge, vision of current problems in the field of study and interdisciplinary context;* - *orientation in a variety of methodological and technological ways to address the essential tasks in the field of research and (or) innovations.*	Knowledge of professional activities, as well as finance, marketing, and international markets. Knowledge at the most advanced level in the field of science.	Upon completion of this educational program, students are expected to be able to: -Know the principles of organizing and planning research in this scientific field; - Interpret fundamental concepts in computer science and new programming paradigms, and apply them in software design and development. - Formulate scientific goals, plan research, and conduct large-scale computational experiments in specific applications. -Critically analyze, evaluate and synthesize new and complex ideas in the field of computer science.

Skills *Graduates are able to*			
Generating ideas, predicting the results of innovation activities implementing large-scale changes in the professional and social sphere, management of complex production and scientific processes	- *carry out ingenious researches contributing to the scientific field and extending its boundaries;* - *substantiate the urgency of the problem, structure its research with a scientific integrity;* - *generate new knowledge in the form justified and reliable results of doctoral research;* - *develop innovative programs of sectorial and interdisciplinary researches on the basis of synthesis of new and the latest concepts, research approaches, challenges.*	Demonstrate skills in developing the company's strategy, change, ability to cope with long-term and time-consuming tasks, analyze diverse information, weigh risks, without loss of motivation and without compromising quality. Ability to research, develop, implement and adapt projects that lead to new knowledge and solutions. Apply special knowledge for critical analysis, evaluation and synthesis of new complex ideas that are at the cutting edge of science in professional activities.	Use big data processing and data mining methods to solve resource-intensive tasks. Develop computational algorithms for engineering tasks and implement them in high-performance systems. Investigate issues of computational complexity and stability of algorithms. Analyze and evaluate the reliability and fault tolerance of computer systems. Compare, analyze, and interpret complex experimental data and draw conclusions.

Responsibility and autonomy *Graduates are ready to*			
Defining a strategy, process management and activity, acceptance decisions and responsibilities at the level institutional structures. The ability to lead, autonomy, analysis, evaluation and implementation complex and innovative ideas in the scientific and practical field. Competent communication in a particular industry scientific and professional activities.	*- critically analyze, evaluate and synthesize new and complex scientific concepts and provide management of their realization;* *- represent own position with arguments in the scientific publications and discussions to the representatives of the scientific community;* *- facilitate within academic and professional contexts to the technological, social, cultural development of region and country;* *- find optimal solutions in complex, non-standard situations;* *- demonstrate autonomy, scientific and professional perfection and commitment to creation of new concepts.*	Independently carry out: management and analytical activities that involve working on complex tasks, where the analysis of the situation or information requires an assessment of various factors, as well as team management. Take responsibility: for the result on a specific site in a structured environment. Solve complex development problems, develop new approaches, using a variety of methods.	Present brand-new topics and research results at international and national conferences, seminars and workshops, both in front of specialists and in an audience that does not have the appropriate professional education. Contribute to original research that expands the boundaries of knowledge by developing a significant amount of work, publish research results in the form of scientific articles in Kazakh and foreign journals. Prepare explanatory notes and applications for research projects, perform planning, and guide and manage research in the field of computer science and related interdisciplinary fields. Organize research, design, and training activities, participate in scientific, government, and industrial research as part of a team, and be prepared for correct and tolerant interaction in society, social interaction, and cooperation to solve scientific and technical problems.

Annex 7

The Minutes of the meeting of the Industry Commission on social partnership and regulation of social and labor relations in the field of education and science of the Republic of Kazakhstan

№ 3

Nur-Sultan *«27» November 2019*

Present: according to the list

Based on the results of the discussion on issues of the agenda, the Sectoral Commission for social partnership and regulation of social and labor relations in the field of education and science of the Republic of Kazakhstan

DECIDED:

1. On approval of the Sectoral qualifications framework for the "Education" sector
2. Approve the Sectoral qualifications framework for "Education" sector
3. Discussion on the draft National qualifications framework for higher education.
4. **Recommend to the National Council on qualifications under the PK Government for approval of the National qualification framework for higher education.**

The decision was made unanimously.

Chirman **Sh. Karinova**

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