**§44**

**Methodological recommendations for educational and professional program expertise**

1. **Evaluation of educational programs and study complex of disciplines**

The introduction of new educational and professional programs, based on the modular-competence approach implies a fundamental change of all educational process, because modular-competence teaching is completely different from the traditional one. The fundamental distinction lies in student`s mastering the competencies required for further professional activity and career growth. The competence development requires the appropriate organization of educational process.

One of the main tasks in the transition to a new educational-professional programs (EPP) is a critical analysis and expertise of the developed programs with the participation of employers on the use of educational technologies that are adequate to the tasks and planned results, including evaluation methods of students’ achievement, as well as the evaluation of program topicality.

The expertise of programs and study packs is held by a group of the skilled experts in the subject area who are involved for the implementation of independent expertise of programs and study complexes. The given programs have the following structure:

1. Description of the program;

2. Specification of the program and module/course catalogues;

3. Study complexes on disciplines;

4. Examination questions and topics of written works (essays, theses);

The submitted educational programs to the expertise should meet the basic requirements to the program:

- programs and study complexes should comply with the priority trends of education and science development and have an innovation focus;

- they should be implemented by highly qualified specialists;

- they should have a high level of the provision by modern informational educational and teaching materials;

- they should be implemented using innovative methods and forms of education;

- they should insure the acquisition of professional competencies by students.

The structure and content of the study complex is analyzed at the first (intra-university) stage.

At the second stage the quality of the study complex is evaluated by external experts by the following criteria:

- topicality of the thematic content;

- compliance of expected learning outcomes with market requirements;

- presence of the competence-criterion assessment of learning outcomes.

Evaluation criteria and indicators of the content and structure of the study complex correspond to the following score - rating system:

0 point is given when the criterion is not shown, or is rarely shown or poorly defined;

1 point - the criterion is rarely and scarcely shown;

2 points - a criterion is frequently or enough shown;

3 points - the criterion is always and clearly shown.

Further, the overall result is calculated.

1. **Evaluation of competencies and learning outcomes**

The learning in the framework of graduate competence-based model requires the reorientation to student-centered approach, which, in its turn, implies a focus shift from teacher to a student; from what is taught to what is studied; from what the teacher wants and can give to what the students will need in their future profession.

The term “learning outcomes” was introduced in 2005 by the Working Group of the Bologna process on the development of European qualification structure. The learning outcomes are defined as what a student is expected to know, understand and/or to be able to demonstrate after learning completion.”

Intended learning outcomes are the determination of knowledge, understanding and skills after the completion of training ( a program, a discipline, a module), i.e., in this case, learning outcomes are the means of the demonstration of competence level. Also it determines what the student will know, understand and be able to demonstrate after the learning completion. They may relate to separate disciplines (modules) or a period of study and determine the necessary conditions for credit earning. Expected learning outcomes are defined by a teacher.

The actual learning outcomes - demonstrated and assessed students’ knowledge and competences on the program completion (disciplines, module).

Expected learning outcomes are a model presentation of learning results to determine the level of a particular qualification. As a basis for national framework qualifications, expected results should be determined by the employer in accordance with professional standards.

Competences, as a dynamic combination of knowledge, understanding, skills and abilities can be formed as a result of studying different disciplines and assessed at different stages. Competencies are acquired by students, and their development is the aim of educational programs. Consequently, the results of educational and professional programs are becoming general and professional competences corresponding to the certain level of education and qualification.

To write competences you should use verbs in the infinitive form: to understand, to have a scientific understanding, to possess, to be able, to possess the ability, to be ready, to be prepared, to know, to use, to take into account, to substantiate, to strive for perfection, to express and etc. Competences should also be written in the form of short sentences using nouns: the ability, skills, knowledge, willingness, devotedness, understanding and etc.

In the competence model of a graduate one of the important components of the educational and professional graduate program is to assess the competence level on a particular specialty.

For objective and accurate assessment of the level of the acquisition of learning outcomes and consequently the level of competence mastery it is recommended to determine the learning outcomes on the discipline (module) in accordance with the following principles:

- begin to determine the learning outcomes from the active verb (to explain, calculate, compare, organize, select, etc.);

- avoid vague terms (to know, understand and others.);

- suggest no more than 10 learning outcomes;

- take into account the importance for future professional activities;

- agree with employers;

- consider the achievability in the availability of resources and training time;

- assure in clear understanding of requirements;

- assure in measurability of learning outcomes.

Monitoring of learning outcomes is the process of comparison of achieved learning results with the planned ones.

Evaluation of learning outcomes is a procedure of determining the compliance of students and graduates` individual educational achievements in professional education with the requirements of the consumers of educational services.

According to the credit technology such an assessment can be made in four stages:

- assessment during the classes (formative and summative assessment);

- examinations on disciplines that provide certain subjective and instrumental professional competences;

- final assessment (a thesis (project) defense) demonstrating the competence level for the solution of specific scientific problems;

- assessment of graduates by employers' Associations which allows evaluating the competence of a specialist in a particular professional field.

Examination should facilitate an accurate assessment of learning outcomes, so the exam questions on subjects within the competence model of the graduate should meet the following requirements:

- compliance with the goals, objectives and thematic content of the course;

- compliance with the claimed competence;

- possibility of precise, specific assessment of learning outcomes;

**Competence-based questions** should be developed within the framework of criterion-based approach with different levels of detailing: either for each competence or for competencies of each cluster.

Questions include competence-oriented tasks. The content of such a task should include educational information, whereas the process of getting an answer to it and the content of the answer to the task should be connected with the future professional activity of graduates.

In making up questions the important role is given to the formulation of the question. It is necessary to avoid complex, confused structured sentences, double negation, etc. Statements should be clear and unambiguous, otherwise, the students can do the wrong assumptions. Sometimes the questions that sound absolutely obvious for developers can be unclear for students, in this case, it would be better to discuss the questions with colleagues or conduct a mini-exam (midterm control) in student groups. In addition, the questions shouldn’t copy the contents of paragraphs and topics of lectures.

**3. Recommendations for the preparation of exam questions**

1. The total number of test questions for the discipline should be not less than 50-60.

2. The total number of questions on examination cards should be 2-5 at the discretion of the teacher.

3. Questions on examination cards should be designed in such a way that the student`s answer can identify the learning result achieved by a student.

4. The questions should be aimed at identifying the limited number of key learning outcomes (not more than 10 results on each discipline). One shouldn’t connect the expected learning outcomes with a particular narrow content.

5. In making up the examination questions you should try to provide its reliability (in fact a student`s answer to a question allows assessing the degree of the formation of the result) and validity (in fact a student`s answer to a question allows assessing that learning result which is necessary to asses).

6. Each examination card should contain questions that reveal the well formed and systematized theoretical knowledge, the ability to operate them, critically evaluate and draw conclusions (“theoretical”), as well as questions that reveal the ability to apply the gained knowledge to solve practical tasks (“practical”).

7. The complexity degree of theoretical and practical problems is recommended to vary depending on the level of teaching and competences being formed. Differences in the levels of competences of one type depending on the stage of teaching:

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| --- | --- | --- | --- |
| **Competence** | **Bachelor`s degree program** | **Master`s degree program** | **PhD program** |
| Knowledge and understanding of the studied subject area | The knowledge of basic principles, schemes, models, classifications, definitions, etc. | The knowledge of the current state and tendencies of the development of scientific knowledge of the studied subject area | Systemic understanding of the studied subject area, profound particular knowledge in the field of research methods used in this sphere. |
|  | Knowledge of the elements of the most advanced knowledge in a particular subject area. | Knowledge of the methodology of scientific cognition in the studied subject area.  Knowledge of the principles and structure of the scientific activity organization in the studied subject area. | Knowledge of the methodology of scientific cognition in the studied subject area.  Knowledge of scientific schools in the studied area, their theoretical and practical developments, scientific concepts and achievements of world and Kazakhstani science in this field, modern trends, directions and regularities of its development. |
| The ability to apply this knowledge in practice. | The ability to apply the gained knowledge to solve ordinary professional tasks. | The ability to apply the gained knowledge in the original way, the ability to solve problems in new or unfamiliar situations, in contexts and frames of broader (or multidisciplinary) areas related to the studied field.  The ability to apply scientific cognition methods to solve professional problems.  The ability to use the gained knowledge for original development and application of ideas in the context of scientific research. | Ability to organize, plan and implement the scientific research process.  The ability to put scientific research results into practice. The ability to make contributions to the expansion of the boundaries of scientific field by their own original research. |
| The ability to collect, analyze and interpret information. | The ability to identify the appropriate information sources, the ability to apply adequate methods of information processing and interpretation | Ability to critically analyze the existing concepts, theories and approaches to the analysis of processes and phenomena. | The ability to analyze, evaluate and compare the different theoretical concepts and make conclusions.  The ability to analyze and process the information from different sources.  The ability to critically analyze, evaluate and synthesize new and complex ideas. |
| The ability to integrate the acquired knowledge to solve professional tasks and to organize professional activities. | The ability to formulate arguments and solve problems in the studied subject area | The ability to integrate the knowledge gained within the framework of different disciplines to solve research problems in new unfamiliar conditions. The ability to work in the conditions of uncertainty  The ability to find creative approaches to solve problems. | The ability to plan, develop, implement and modify a complex process in scientific research in the studied subject area based on modern theories and methods of analysis.  The ability to generate own new scientific ideas, share knowledge and ideas with scientific community expanding the scientific knowledge boundaries |
| The ability to evaluate and formulate judgments. |  | The ability to cope with challenges and to make judgments based on incomplete or limited information. | The ability to examine scientific projects and studies. |
| The ability for self-development and further education | Skills to acquire new knowledge required for daily professional activity and continuation of the education in the Master`s degree program. | The ability to continue self-study to broaden and deepen knowledge necessary for everyday professional activity and continuation of the education in PhD program. | The ability to plan and predict own further professional development. |
| Knowledge of the necessary techniques, methods, applications, technologies, etc. (instrumental competence) | The ability to use  modern technology, the ability to use information technology in the field of professional activity | The ability to conduct information-analytical and information-bibliographical work using modern information technologies.  A good command of foreign language at a professional level, which allows to carry out scientific research and implement the teaching of special disciplines at universities.  The ability to apply knowledge in pedagogy and psychology of higher education in educational activities. The ability to use interactive teaching methods. | The ability to select and effectively use modern research methodology. Ability to conduct a patent search. The ability to transfer scientific information using modern information and innovative technologies.  A good command of foreign language for scientific communication and international cooperation.  Knowledge of the principles of the protection of intellectual property rights for scientific discoveries and developments.  Competence in the issues of the university-level training of specialists. |
| The ability to create and send informational messages for different target audiences (communication skills). | The ability to share information, ideas, problems and solutions both with specialists and with non-specialists. | The ability to clearly and accurately inform about conclusions and the knowledge and substantiate them to specialists and non-specialists. The ability to generalize the results of scientific research and analytical work in the form of dissertations, scientific articles, reports, analytical notes, etc.  Professional and cross-cultural communication skills. Oratory skills, the skills to correctly and logically design own thoughts in oral and in written form. | The ability to inform colleagues, the scientific community and society at large about own knowledge and achievements. The skills of scientific writing and scientific communication. Professional and cross-cultural communication skills.  The skills of oratory and public speaking at international scientific forums, conferences and seminars. |

8. Answer quality scale should be made up for each category of problems. It allows evaluating the degree of the formation of learning outcomes and the grade corresponding to it. Example:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Grade parameter | Excellent | Good | Satisfactory | Bad |
| Knowledge | Demonstrate complete understanding of the questions, mathematical ideas and processes | Demonstrate significant understanding of the questions, mathematical ideas and processes | The answer shows the presence of the limited understanding of the problem. | The answer shows the complete lack of the understanding of the problem. |

9. Recommendations for the formulation of examination questions:

- on the one hand examination question should not be aimed at confusing the student, on the other it should not be so simple to guess a correct answer easily;

- in the preparation of exam questions it`s better to take into account what level of knowledge is revealed by this/that question and try to make up questions so that the answers require not a simple recall of certain information but the ability to handle it from a student:

|  |  |
| --- | --- |
| Kind of question | What does it reveal? |
| Questions as «give a definition to…….», «name……..», «describe………..», «point out………..» etc. | Recall of certain information, which is not necessarily accompanied by its understanding. Examples: “Identify and describe the ethical issues related to scientific research.” “Describe how and when legislation is changed and what consequences it has for society?” “Point out the requirements that should be taken into account when a TBC patient is taken care of.” |
| Questions as «explain…………..», «give an example…………..», «solve …………….», «calculate………….», «reveal………….», «give an interpretation………………», «indicate the differences………….», «identify…….» etc. | The ability to understand and interpret the gained information (knowledge). Examples: “Identify the difference between civil and criminal law.” “Identify people who are involved in the development of e-commerce and their goals." “Explain what social, economic and political consequences the Second World War led to during the post-war period?.” “Identify the factors that hindered the development of the education system in Ireland in the late 19th century.” |
| Questions as «use…………..», «find out……………..», «choose……», «establish the connection………..», «show………» etc. | The ability to use the acquired knowledge to solve new tasks. Examples: “Draw a time scale of the most significant events in the history of Kazakhstan in the 19th century.” “Choose the methods of analysis and apply them for the evaluation of the energy use efficiency in complex production processes.” “Change the production standards for small enterprises in order to ensure a higher level of product quality control (case study).” |
| Questions as «compare………..», «find out the relation between………….», «evaluate critically……….», «check…………..», «identify the categories………….», «explain the differences……… », discuss…………», «substantiate……» etc. | The ability to analyze the information to find out the relationships and identify the fundamental principles. Examples:  “Compare and find out the differences between different models of e-business.” “Analyze why society considers certain types of behavior as anti-social.” “Substantiate the economic and environmental effects of energy conversion.” |
| Questions as «combine…………», «draw up a plan………..», «formulate……», «develop……», «modify………» etc. | The ability to synthesize using the information to create a new one. Examples: “Show the causes and consequences of the Great October Revolution of 1917”. “Identify and specify the problems, the solution of which are closely related to the use of methods of power management.” |
| Questions as «evaluate……………», «solve………….», «prove………..», «predict…………», «evaluate critically………………» etc. | The ability to assess the compliance of the material / information with specific purposes. Examples: “Evaluate the role and significance of key personalities in the process of historical change in the history of the USSR.” “Evaluate the marketing strategies for different models of e-business.” “Identify the main contribution of Michael Faraday to the field of electromagnetic induction.” |

- In the preparation of examination questions for master and doctoral students one should focus on the assessment of knowledge and skills of a higher level;  
- In the preparation of examination questions for master and doctoral students the preference should be given to questions that reveal the ability to establish the inter subject and interdisciplinary relationships, the ability to find the solution in the case of insufficient or new information, the ability to critically evaluate the existing knowledge and methods, as well as the ability to identify the problem and perspective trends in a particular subject area.

Appendix 1

EMC quality assessment

1 stage

Discipline\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Module\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Specialty\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

EMC developer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| --- | --- | --- | --- |
| **№** | **Criteria** | **Points** | **Comments** |
|  | *Structure* |  |  |
|  | - syllabus |  |  |
|  | - lecture notes |  |  |
|  | - methodical guidelines to seminars, practical and laboratory classes |  |  |
|  | - methodical guidelines to IWS |  |  |
|  | - map of availability of educational and methodical literature |  |  |
|  | - Monitoring instruments (exam, colloquium and midterm questions, etc.) |  |  |
|  | *Content* |  |  |
|  | the relevance and topicality of the program, i.e., the use of the latest scientific research results |  |  |
|  | - compliance of the proposed learning outcomes with stated program competencies |  |  |
|  | - compliance of thematic content with the intended learning outcomes |  |  |
|  | - comliance of control methods with the goals, objectives and thematic content of the course |  |  |
|  | - compliance exam questions with the stated competencies |  |  |
|  | - possibility of precise and concrete evaluation of learning outcomes |  |  |
|  | - the use of innovative learning technologies |  |  |
|  | TOTAL |  |  |

Appendix 2

EMC quality assessment

1 stage

Discipline\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Module\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Specialty\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

EMC developer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| **№** | **Criteria** | **Points** | **Comments** |
|  | - relevance and topicality of the program, i.e., the use of the latest scientific research results |  |  |
|  | - compliance of proposed learning outcomes with the stated program competencies |  |  |
|  | - compliance of thematic content with the intended learning outcomes |  |  |
|  | - possibility of precise and concrete assesment of learning outcomes |  |  |
|  | TOTAL |  |  |