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MODELING THE EDUCATIONAL PROGRAM OF A TEACHER TRAINING WITHIN THE COMPETENCY-BASED APPROACH

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The aim of the article is to determine the components for modeling the educational program of a teacher training within the competency-based approach in education. To achieve the aim, a number of tasks are solved in the research: a review and analysis of the problem in modern pedagogical literature, the identification of competencies' types, the analysis of questionnaires. The authors analyzed students' questionnaires and showed the ranking results of the general and professional competencies of students studying the educational program of higher education "Pedagogical Sciences". The study compares and analyzes the competencies selected by students, which are the most and least significant for their future professional activities. A number of recommendations are given for the organization and implementation of research activities and forming students' research competency throughout the learning process at the university.

Key words: modeling the educational program, professional competency, research competency, competency-based approach, ranking, modernization of education

Introduction

Modernization of pedagogical education and raising the teacher's profession status are a priority area of the state program for the development of education and science of the Republic of Kazakhstan for 2020 – 2025 [1]. The leading idea of modernization of education is forming general (basic, key, universal) and professional (subject-specialized) competencies of a university graduate, corresponding to the competency-based model of learning results.

The aim of the article is to determine the components for modeling the educational program of a teacher training within the competency-based approach in education. To achieve the aim, four tasks are solved in the research:

- 1) analysis of the problem in modern pedagogical literature;
- 2) classification and identification of competencies' types;
- 3) analysis of students' questionnaires;
- 4) distinguishing psychological and pedagogical basics of modeling the educational program for training teachers.

The study describes the results of ranking of the most significant competencies for full-time students of pedagogical specialties of seven universities: Pavlodar State Pedagogical University, S. Toraighyrov Pavlodar State University, Shakarim State University, Eurasian National University named after L.N. Gumilyov, Miras University, Kazan Federal University and Kalmyk State University. The study was conducted from September to December 2019, the total number of respondents is 682 of 1-4 year students.

Research methods

To describe the theoretical basics of our study, an analysis and generalization of Kazakhstani and foreign scientists' research works about the requirements for a teacher's competencies were carried out. In order to identify significant competencies for 1-4 year students, questionnaires, ranking and analysis of the data were used. A comparison and analysis of the competencies selected by students, which are the most and least significant for future professional activities, was accomplished.

Literature review

To solve the first task, a review of modern studies in the field of pedagogy and psychology is performed. In the works of N.N. Khan, K.K. Zhampeyisova, Sh. Zh. Kolumbayeva the basic requirements for a teacher, including key and professional competencies, requirements for teacher training on competency-based model were disclosed [2; 4].

So, in educational programs for bachelors of education, compiled in accordance with the State Compulsory Standard of Higher Education [3] and the professional standard "Teacher" [4], a number of necessary competencies of a university graduate is presented.

Among professional requirements, as an independent unit, research competency stands out, it is a part of the professional competencies of a teacher, which includes six requirements:

- 1) the ability to use the results of the diagnosis of students' individual characteristics;
- 2) the ability to identify learning needs and difficulties;
- 3) the ability to use methods of reflection with colleagues in the context of a practice study; the ability to plan and conduct studies of the educational environment;
- 4) knowledge of the principles and methods of studying the educational environment, educational research;
- 5) knowledge of research methods in pedagogy;
- 6) knowledge of methods of psychological and pedagogical observing of students [4; 52].

A research competency of a teacher in the Republic of Kazakhstan is regulated by a separate group of requirements, which make up a half of the professional requirements.

Kazakhstani and foreign scientists express the opinion on the importance of the research competency of future teachers, saying that this competency will positively affect the quality of education.

Sh.B. Khan and S.H. Chishti write that it is necessary to form the research competency of future teachers during their studies at a higher educational institution. In their opinion, competency in this area is a fundamental element in providing quality education, and a teacher is the main agent for imparting of education quality. The target of quality education can only be achieved with quality of teacher training. The authors associate a high level of teaching quality with the availability of research competency among teachers [5; 87].

Scientist of Cambridge University K.S. Taber in his work notices "teaching should be an evidence-led and research-based profession: that teachers should be expected to both be aware of relevant research about teaching and learning, and also be capable of undertaking small-scale classroom research to address professional issues and problems that arise in their work" [6; 20].

I. Emelyanova proves that students in the process of getting professional education should learn the technique and methodology of pedagogical research in order to master the elements of research activity and understand the meaning of pedagogical research in the context of an educational situation [7; 706].

In our study, we consider research competency as the willingness of an individual to carry out research activities in a particular field of activity. This definition indicates the main attribute of competency, its relationship with the activity, which is formed on the relation "process of activity – result of activity" [8; 68]. Research competency means having methodological knowledge and skills, the ability to formulate a problem, the ability to project, using research methods in pedagogical process and doing research.

Results and discussion

The study covered 682 of 1-4 year undergraduate students studying at seven universities: Pavlodar State Pedagogical University, S. Toraighyrov Pavlodar State University, Shakarim State University, Eurasian National University named after L.N. Gumilyov, Miras University, Kazan Federal University and Kalmyk State University. 38.7% (264 students) of them are freshmen, 17.1% (117 students) are second-year students, 35.8% (244 students) are third-year students, and 8.4% (57 people) are fourth-year students of the educational program of higher education "Pedagogical Sciences". The subject of the research is the priorities in the form of the results of the educational process, i.e. competencies. In order to clarify the most significant general (key) and professional competencies for students, a questionnaire was proposed, the calculation is based on the direct ranking of a list of ten most important competencies in alphabetical order (academic, communicative, computer, cultural, educational, entrepreneurial and economic, language, organizational and managerial, research, social competencies).

To solve the second task, an analysis of competencies by type of activity was performed, as a result of which, types of competencies (general (key) and professional) of a teacher in the field of teaching foreign languages were determined (table 1).

Table 1 - Types of competencies by type of activity

Academic competency	Communicative competency	Computer competency	Cultural competency	Educational competency
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Entrepreneurial and economic competency	Language competency	Organizational and managerial competency	Research competency	Social competency
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- academic competency (ability to acquire new knowledge in the field of social and humanitarian disciplines, usage of this knowledge in professional activities, understanding of pedagogy, psychology and teaching methods, ability to be open to new knowledge, mobility, a high interest in knowledge of educational and cognitive activities organization, readiness to a life-long learning, willingness to self-education and self-realization);

- communicative competency (ability to negotiate, find compromises, defend one's point of view correctly, willingness to cooperate, ability to a quick adaptation, knowledge of ways to interact with others, ability to conduct discussions, ability to ask and answer questions, ability to write letters and fill in questionnaires);

- computer competency (ability to use information technologies in the field of professional activity, knowledge of using a personal computer, having skills to find necessary information in the Internet resources, cloud and mobile services, ability to use information interactively, knowledge of the basics of computer science, have skills to use the means of new information technologies to solve certain problems, ability to use information facilities in learning process, ability to use information communication technologies (ICT) effectively);

- cultural competency (ability to perceive and respect intercultural differences, ability to take into account cultural characteristics and mentality in a multicultural and multiconfessional society, knowledge of somebody's national cultural heritage, knowledge of spiritual, moral and cultural basics of social phenomena);

- educational competency (ability to organize the educational process, understanding of the educational value of teaching, ability to use new technologies in the educational process, ability to carry out educational work in the learning process);

- entrepreneurial and economic competency (knowledge of the fundamentals of economy, management, finance, economic development trends of the republic, ability to engage in entrepreneurial activity, ability to evaluate resources for solving problems in professional activities, be able to see opportunities for professional activities, ability to plan, manage, delegate, analyze, evaluate, keep records, take an initiative on oneself, be decisive and be able to act in advance);

- languages competency (knowledge of Kazakh, Russian and foreign languages, master oral and written speech, to use knowledge of foreign languages to communicate and understand special texts, knowledge of professional terminology, ability to teach the subject in accordance with educational standards in the Republic of Kazakhstan and European trends, ability to build dialogue and communication in a multicultural society);

- organizational and managerial competency (ability to find organizational and managerial solutions to problems, ability to plan independently, ability to take the initiative, ability to be organized, be independent in solving tasks, readiness to life-long learning using reflective ways to organize the learning process);

- research competency (knowing general scientific methods of cognition, ability to formulate the topic of abstract, term paper, thesis or project, ability to formulate the goal and objectives, object, subject of study, ability to collect and interpret information from journals and articles, ability to analyze research results and be responsible for the results of the study, ability to explain observed phenomena, consistency and thoughtfulness in solving problems);

- social competency (knowing social development trends in society, social priorities, understanding of national policy goals, having communication skills, ability to cooperate, maintain good relations with people, demonstrate flexibility, ability to social interaction, respect and tolerance).

To solve the third task, an analysis of the importance of competencies' types for students was carried out, the result revealed competencies' types ranking of a future teacher in the field of education.

As a result of the ranking, the types of competencies that are significant for the first-year students (264 students) were distributed as follows:

1. Educational competency - 28.4% (75 students);
2. Language competency - 14.4% (38 students);
3. Academic competency - 12.5% (33 students);
4. Communicative competency - 8.3% (22 students);
5. Organizational and managerial competency - 7.7% (20 students);
6. Computer competency - 7.2% (19 students);
7. Cultural competency - 6.8% (18 students);

8. Research competency - 6.4% (17 students);
9. Social competency - 4.9% (13 students);
10. Entrepreneurial and economic competency - 3.4% (9 students).

Educational competency takes the first place among the first-year students in the hierarchy of proposed competencies with a significant difference from the average indicator with 20.7%. This indicator shows that students focus on study. The last place among the first-year students takes entrepreneurial and economic competency because knowledge of economic development trends, knowledge in the field of management, marketing and the fundamentals of entrepreneurship is not a priority for students of pedagogical specialties.

According to the importance, types of competencies for the second-year students (117 students) were distributed as follows:

1. Educational competency - 29% (34 students);
2. Academic competency – 19,7% (23 students);
3. Language competency – 12,8% (15 students);
4. Social competency – 9,4% (11 students);
5. Communicative competency – 8,6% (10 students);
6. Cultural competency – 7,7% (9 students);
7. Research competency – 6,8% (8 students);
8. Entrepreneurial and economic competency - 3.4% (4 students).
9. Organizational and managerial competency - 2.6% (3 students);
10. Computer competency - 0% (0 students).

In the first place, the second-year students put educational competency with a difference of 20,4% from the average level. The second-year students also devote a significant amount of time to the educational process. The least significant competency for second-year students is computer competency. The majority of students have the skills of using personal computers in the educational process with the goal of extracting, storing and presenting information, therefore they do not consider this competency the most significant one.

Significant orientations for the third-year students (244 students) are presented as follows:

1. Academic competency - 16% (39 students);
2. Educational competency - 14.3% (35 students);
3. Language competency - 13.5% (33 students);
4. Communicative competency - 11.9% (29 students);
5. Cultural competency - 10.7% (26 students);
6. Research competency - 9.8% (24 students);
7. Social competency - 7.8% (19 students);
8. Organizational and managerial competency - 6.2% (15 students);
9. Computer competency - 5.3% (13 students);
10. Entrepreneurial and economic competency - 4.5% (11 students).

Academic competency for the third-year students is the most important. The difference between the average indicator is 5.3%. Students have shifted emphasis on the development of new knowledge, the acquisition of professional skills, the desire for self-education and self-realization. The least important competency for future teachers is entrepreneurial and economic competency, as it is not associated with their future professional activities.

The significance of the competencies for the fourth-year students (57 students) is distributed as follows:

1. Educational competency – 21% (12 students);
2. Language competency – 19,3% (11 students);
3. Academic competency – 15,8% (9 students);
4. Communicative competency - 14% (8 students);
5. Cultural competency – 10,6% (6 students);
6. Research competency – 8,7% (5 students);
7. Organizational and managerial competency - 5.3% (3 students);
8. Social competency - 3.5% (2 students);
9. Entrepreneurial and economic competency - 1.8% (1 student);
10. Computer competency - 0% (0 students).

For the fourth-year students, the most significant competency is educational competency. After pedagogical practice, the ability to organize the educational process and an understanding of the educational value

of teaching is very important for graduate students. The last place takes computer competency. Graduate students have technical skills and knowledge of using the Internet resources and they try to use information and communication technologies in the learning process confidently.

Comparative analysis of students' orientation and focus on a particular competency is shown in the figure 1.

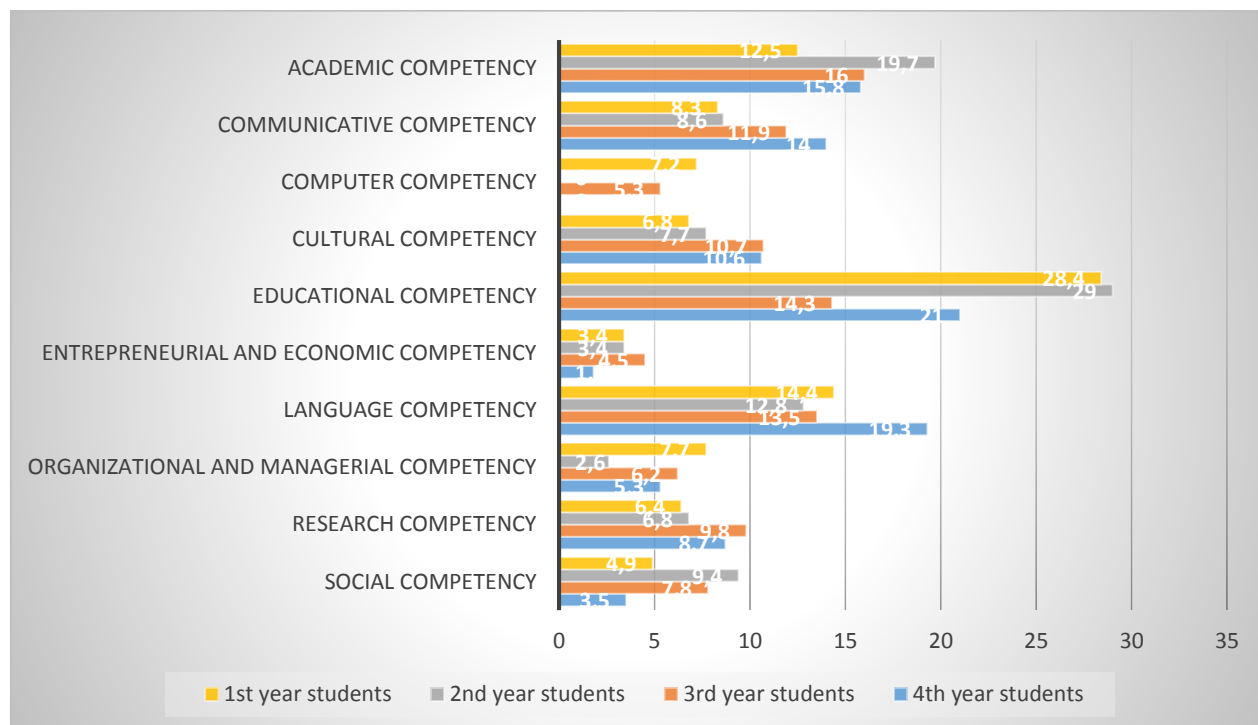


Figure 1 – Ranking of competencies' types of the 1-4th year students (Compiled by the authors)

The ranking calculation was compiled as follows:

- the sum of the rank is $\Sigma=55$;

- $n=10$.

To verify the correctness of the calculation, we use the formula:

$\Sigma (R_i) = n*(n+1)/2$, so $\Sigma (R_i) = 10*(10+1)/2 = 55$

The sum of the rank and the checksum are equal and means that the ranking is carried out correctly.

The survey among students showed their orientation and focus on a particular competency. The overwhelming majority of students of all courses from 1 to 4 have chosen the most significant competencies, which are educational, academic, language and communicative competencies. The least significant competencies for students are entrepreneurial and economic, organizational and managerial, computer competencies. The ranking of competencies revealed the following trend: research competency among the first-year students takes the eighth position. In the second year of study this competency takes seventh place. In senior courses (3 and 4), research competency is located at the sixth rank. For 3-4 year students an understanding the need of research competency appears, they realize that knowledge of the basics of research activities helps to prepare and arrange graduation thesis. The low position of research competency among students is observed due to several reasons: students have no clear idea of the goals, objectives and the process of conducting research activities; difficulties in performing research tasks related to lack of knowledge; inability to evaluate research results.

The revealed contradiction between the types of competencies that are necessary for training a highly qualified specialist, and the level of awareness of their importance by students, is resolved by distinguishing psychological and pedagogical basics of modeling the educational program for training teachers:

1. in the field of the goal-setting development of educational program (EP): goals-competencies.

2. In the field of developing the content and structure of educational program. In the structure of educational program, selected types of competencies should be depicted as a structure with horizontal and vertical connections of qualities, properties and requirements that form a system model of a specialist' professional readiness [9; 49].

Among named types of competencies by type of activity, one of the main types is research competency. The content of competencies, their classification show that the professional activity of a teacher is associated with creativity and research. Therefore, research competency is either an independent structure, or is included in other competency groups. Research competency includes knowledge of research methods and techniques, development and conduct of research. This type of competency is of great importance in the acquisition of scientific thinking skills. Research competency helps improve all competencies.

3. In the field of dynamics and criteria for forming a teacher's readiness levels, a description of types of competencies, levels of readiness for professional activity is used for several purposes: the content of education, teaching methods, teaching technologies, assessment, measurements.

Each type of competency contains four levels of readiness: operational level, functional level, research level and expert level [9; 50].

The operational level means the level of readiness for activity that meets the basic requirements for training a specialist within the framework of State Compulsory Educational Standard and is determined by such requirements as "to have an idea", "to know", "to be able", "can do".

The functional level is the level of readiness corresponding to a competency characterized by the mastering of the studied subject as a static and dynamic scientific system and is determined by the requirements in forming a scientific and theoretical way of thinking.

The research level is the level of readiness corresponding to such a degree of competency, which involves the planning and implementation of research work.

The expert level is the level of readiness characterized by the development of professional thinking, the ability to carry out an expert assessment of the content and organization of education [9; 52].

4. In the field of developing technology for managing the educational process, the content and structure of educational programs should fulfill the functions of managing the educational process: strengthening the independent activities of students in the learning process, i.e. credit technology of training, which is aimed at maximizing the realization of students' potential and enhancing the role of independent work, demonstrating their creativity and the fulfillment of tasks, and their active participation in research work. Credit technology is based on the pedagogical principles of development of educational programs, which include the following [9; 54-57]:

1) strengthening psychological and pedagogical training: integration of homogeneous disciplines, systematization of through disciplines study, increasing academic hours of elective disciplines;

2) differentiation of content and teaching methods. In syllabi lecture materials have a high level of theoretical generalization, which reinforces the difficulty of practical exercises. Additional forms of attracting students to participate in research include:

- student conferences, further publication of articles in conference proceedings;
- seminars or round tables in which a specific problem is proposed for discussion at each meeting;
- creative meetings with scientists and experts;
- Olympiads, both intra-university and inter-university, regional and international;
- research competitions for students of all years of study in which priority areas and problems are set;
- exhibitions of youth scientific works;
- student scientific and discussion clubs at the departments, which take place in discussion forms,

having a research character;

- student research and other creative associations;
- electives;

3) individualization of training – psychological characteristics of students in the task system, the organization of individual classes aimed at forming independent work and research skills of students;

4) the variability of training allows students to choose elective disciplines and additional courses.

Within the competency-based approach in education, the fields and principles of modeling the educational program (EP) for teacher training have been determined, which are interconnected:

Areas of modeling EP - Pedagogical principles of modeling EP

1. In the field of goal-setting – Strengthening psychological and pedagogical training.

2. In the field of development of content and structure of educational programs – Differentiation of content and teaching methods.

3. In the field of dynamics and criteria for forming a teacher's readiness levels – Individualization of training.

4. In the field of developing technology for managing the educational process – Variability of training.

Conclusion

The article defines the components and the terms of modeling the educational program of teacher training within the competency-based approach in education. A review and analysis of the problem in modern pedagogical literature is carried out, types of competencies are identified. Students' questionnaires were analyzed and the results of ranking of general and professional competencies of students in the profile of the educational program of higher education "Pedagogical Sciences" are shown.

In the study a number of competencies were proposed for 1-4 year students, the significance of definite competencies was identified and distributed in accordance with priorities.

The criteria for forming a teacher's readiness levels are identified: operational level, functional level, research level and expert level, on the basis of which the dynamics of criteria for forming a teacher's readiness levels were described.

The study showed that for most students of pedagogical specialties it is necessary to form a readiness for research activities, which subsequently will require the development of methodological support for planning and organizing research activities, and then an experimental study of forming research competencies throughout the learning process at the university.

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Құзыреттілік тәсіл шеңберінде педагогты даярлауда білім беру бағдарламасын модельдеу

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Мақаланың мақсаты – құзыреттілік тәсіл шеңберінде педагогтарды даярлауда білім беру бағдарламасын модельдеудің құрамдас бөлшектертерін анықтау. Мақсатқа жету үшін зерттеуде бірқатар міндеттер шешіледі: қазіргі заманғы зерттеулерде бұл мәселенің шолуы және талдауы, құзыреттіліктердің түрлерін анықтау. Авторлар студенттердің сауалнамаларын талдады және «Педагогикалық ғылымдар» жоғары білім берудің білім беру бағдарламасы бойынша студенттердің жалпы және кәсіби құзыреттіліктерін саралау нәтижелерін көрсетті. Зерттеуде студенттердің кәсіби қызметтерінде неғұрлым көп және аз маңызды болып таңдалған құзыреттіліктердің салыстыруы және талдауы жүргізілді. Зерттеу қызметін ұйымдастыру және жүзеге асыру және жоғары оқу орнында білім алу барысында студенттердің зерттеу құзыреттілігін қалыптастыру үшін бірқатар ұсыныстар берілді.

Түйін сөздер: білім беру бағдарламасын модельдеу, кәсіби құзыреттілік, зерттеу құзыреттілігі, құзыреттілік тәсіл, саралау, білім беруді жаңғырту.

**Моделирование образовательной программы подготовки педагога
в рамках компетентностного подхода**

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Цель статьи определить составляющие для моделирования образовательной программы подготовки педагогов в рамках компетентностного подхода в образовании. Для достижения цели в исследовании решаются ряд задач: обзор и анализ проблемы в современных исследованиях, выделение типов компетенций и анализ анкет. Авторы проанализировали анкеты студентов и показали результаты ранжирования общих и профессиональных компетенций студентов профиля образовательной программы высшего образования «Педагогические науки». В исследовании проведены сравнение и анализ выбранных студентами компетенций, которые являются наиболее и наименее значимыми для их профессиональной деятельности. Дан ряд рекомендаций для организации и реализации исследовательской деятельности и формирования исследовательских компетенций студентов на протяжении всего процесса обучения в вузе.

Ключевые слова: моделирование образовательной программы, профессиональная компетенция, исследовательская компетенция, компетентностный подход, ранжирование, модернизация образования.

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