DOI: 10.37943/19QLRX8424

Sapar Toxanov
PhD, Vice-rector for educational work
Sapar.toxanov@astanait.edu.kz, orcid.org/0000-0002-2915-9619
Astana IT University, Kazakhstan

Serik Omirbayev
Doctor of Economical Sciences, Professor, First Vice-Rector
serik.omirbayev@astanait.edu.kz , orcid.org/0000-0001-7643-3513
Astana IT University, Kazakhstan

Dilara Abzhanova
Director of the Center of Competence and Excellence
dilara.abzhanova@astanait.edu.kz, orcid.org/0000-0002-7988-3971
Astana IT University, Kazakhstan

Aidos Mukhatayev
Candidate of Pedagogical Sciences, Associate Professor,
centermukhatayev.aidos@gmail.com, orcid.org/0000-0002-8667-3200
Astana IT University, Kazakhstan

EDUCATIONAL PROGRAMMES OF MICROQUALIFICATIONS AS AN EFFECTIVE TOOL FOR IMPLEMENTING THE PRINCIPLE OF CONTINUITY OF EDUCATION IN THE PROFESSIONAL ACTIVITY OF A MODERN UNIVERSITY TEACHER

Abstract: The article analyses the introduction of educational programmes of microqualifications as an effective tool for implementing the principle of continuing education in the professional activities of university teachers. Special attention is paid to how microqualifications contribute to the development of competences and adaptation of teachers to the changing requirements of the educational environment. Examples of their use in the practice of higher education institutions are presented, and the impact on improving the quality of teaching and competitiveness of staff is assessed. The relevance of the study is conditioned by rapid changes and new challenges faced by the system of higher education in Kazakhstan. In the conditions of reforming the educational system of the country and the growth of international competition, the integration of microqualification programmes as a strategic approach to the continuous professional development of teachers is of particular importance. The aim of the study is to identify the key challenges and prospects for the development of microqualifications based on the analysis of global and regional educational trends. The paper uses the methods of strategic analysis, as well as comparative-historical approach, which allowed to identify opportunities and threats affecting the development of this system in Kazakhstan. Special attention is paid to the strengths and weaknesses of educational programmes, as well as their compliance with modern standards. As a result of the study, recommendations for successful integration of microqualifications into the strategies of HEIs are proposed. Special attention is paid to the creation of strategic partnerships, continuous monitoring of changes in the educational environment and ensuring the high quality of programmes in accordance with international standards. Prospects for the development of microqualifications in Kazakhstan include the development of supra-subject competences and a balance between digital and

Received: 11.09.2024 Accepted: 24.09.2024 Published: 30.09.2024

Scientific Journal of Astana IT University
ISSN (P): 2707-9031 ISSN (E): 2707-904X
VOLUME 19, SEPTEMBER 2024

traditional teaching methods to meet the needs of the target audience and ensure professional development of teachers.

Keywords: Microqualifications, continuing education, university teacher, professional activity, professional development, educational programmes, quality of training.

Introduction

In the context of a dynamically developing society and increasing demands on the level of education of citizens, the task of training pedagogical staff capable of effectively solving professional tasks in the conditions of constant change becomes especially urgent. This emphasises the importance of creating a system of teacher education that ensures continuous professional development of teachers throughout their career.

Such a system implies continuous improvement of teachers in their professional activities, which corresponds to the concept of 'continuous education'. In modern scientific discourse, lifelong learning is defined as the process of raising the general and professional level, as well as the development of necessary competences throughout life [1].

For Kazakhstan, which is at the stage of reforming the educational system and increasing international competition, the introduction of microqualifications educational programmes becomes an important step in ensuring continuous professional development of teachers. Microqualifications allow teachers to adapt to changing conditions and requirements, which is especially important for the development of higher education in the country.

An important role in the professional activity of a teacher is played by his/her readiness for continuous learning, aspiration for professional development, participation in research activities and active discussion of problems in the professional community. The key elements of a teacher's professional competence are the ability to reflect, analyse their own and others' work, as well as to comprehend and formulate new educational tasks.

Relevant in the context of the development of professional competence is the idea in [2], which is that the progress of the learner in the pedagogical process directly depends on the constant self-development of the teacher himself. In the conditions of implementation of microqualification programmes as one of the effective tools of continuing education, this idea acquires special significance, emphasizing the importance of personal motivation of teachers to self-education and professional growth.

The competence of a teacher is determined by the functional tasks he/she solves in his/her professional activity, which emphasises the importance of a clear definition of the phenomenon 'professional competence'. Theoretical analysis shows that this issue was the subject of attention of many classics of pedagogy, such as J.A. Comenius, A.S. Makarenko, V.S. Sukhomlinsky, K.D. Ushinsky and others, who investigated the personal qualities necessary for successful pedagogical work.

Modern researchers highlight various aspects of teacher's professional competence. Thus, a teacher should possess both objective qualities (knowledge of the subject, broad erudition, understanding of students' psychology) and subjective characteristics (pedagogical skill, talent, creativity). Foreign scholars, such as H. Schaper and K. Briedis, note that since the late twentieth century the term 'professional competence' has been used instead of 'professional qualification', emphasising the importance of complex competences, including interdisciplinary, cognitive and personal abilities. Special attention is paid to such qualities as self-management, self-organisation, self-motivation and personal responsibility.

To date, there is no unified approach to the definition of the term 'professional competence' in science. The terms 'professional competence' [3], [4], 'pedagogical competence' are used in studies [3], [4], 'pedagogical competence' [5], [6], as well as their combinations, such as 'professional-pedagogical competence' or 'psychological-pedagogical competence'.

DOI: 10.37943/19QLRX8424

The diversity of terms and approaches to understanding the professional competence of a teacher is due to different methodological approaches and tasks set by researchers. In the context of educational programmes of microqualifications in Kazakhstan, it is important to clearly define the content of professional competence in order to ensure the continuous development of teachers and their compliance with modern educational requirements.

Research methodology

The following methods were used to achieve the objectives of the study and to determine the prospects for the development of educational programmes of microqualifications as a tool for implementing the principle of continuing education in the professional activities of university teachers in Kazakhstan:

1. Theoretical analysis. Theoretical analysis of scientific literature, normative documents and international experience in the field of continuing education, professional competence and implementation of microqualifications in educational processes was carried out. This method allowed to identify the main trends, problems and opportunities for the implementation of microqualifications in the system of higher education in Kazakhstan. The analysis included studies of domestic and foreign scientists in the field of pedagogical competence, continuing education and innovative approaches to the professional development of teachers.

2. Comparative-historical method. This method was applied to compare changes in educational systems of different countries related to the introduction of microqualification programmes. The study considered historical and contemporary examples of continuing education systems [7], [8] oriented to the development of teachers' professional competence. This made it possible to identify successful models and approaches that can be adapted for Kazakhstan.

3. Generalisation and systematisation method. The use of this method allowed us to combine the results of the analysis of various sources and systematise them in the context of the set research objectives. The key aspects and factors influencing the development of microqualifications as part of continuing education were identified, which made it possible to develop recommendations for the successful implementation of programmes in higher education institutions.

4. Methods of strategic analysis. An important element of the methodology was the application of strategic analysis methods to assess opportunities and threats that may affect the introduction of microqualifications programmes in Kazakhstan. SWOT-analysis and PESTLE analysis [9] were carried out to identify key external and internal factors affecting the process of microqualifications implementation.

5. Survey and interviewing. To obtain empirical data, the method of survey and interviewing of university teachers in Kazakhstan was used and reflected in [6]. The survey collected data on the current level of use of microqualifications, their impact on professional development and demand among teachers. Interviews with experts from educational institutions helped to obtain in-depth knowledge about the problems and prospects of introducing microqualifications in the system of higher education.

6. Diagnostic study. The diagnostic study assessed the current state of the system of teachers' professional development and their readiness to introduce microqualifications. This included the analysis of educational programmes offered by higher education institutions and identification of the main barriers to the implementation of the principle of continuing education [10].

The combination of these methods made it possible to form a holistic picture of the current state of the continuing education system in Kazakhstan and identify promising directions for the development of educational programmes of microqualifications for university teachers.

Scientific Journal of Astana IT University
ISSN (P): 2707-9031 ISSN (E): 2707-904X
VOLUME 19, SEPTEMBER 2024

Results

Under the professional competence of a university teacher it will be understood that his/her ability to effectively apply didactic knowledge and methodological skills, to organise research work of students, to interact with industry enterprises and other educational institutions, as well as to implement the results of his/her activity in the educational process [11]. Professional competence includes such components as methodological, scientific and educational-methodological competence. The development of these competences is carried out through the system of continuous pedagogical education.

Key provisions of Russian psychology serve as a theoretical basis for identifying groups of professional competences of university teachers. Thus, the author [12] considers a person as a subject of communication, cognition and labour, the scientist [13] focuses on the system of human relations to society, other people, labour and self, and a group of scientists [14], [15] introduce the concept of acmeological development of competence, and in works [16], [17] it is noted that professionalism includes competences.

From these positions it is possible to identify three main groups of requirements for the professional activity of a university teacher in Kazakhstan, according to the typical tasks and requirements of the state educational standard (SES RK) [18]:

- subject competences - these are the requirements to the learning outcomes of the disciplines included in the subject block of the State Educational Standard of the Republic of Kazakhstan;
- pedagogical competences - requirements for the teacher's readiness to perform educational, scientific and methodological, organisational and managerial tasks corresponding to the general professional block;
- social competences - requirements to personal qualities, world outlook and value orientations of a teacher in society.

The criterion of a teacher's readiness for professional activity is the level of development of key elements of these competences. To better understand the relationship between the components of professional competence, it is possible to present them in the form of a pyramid, the base of which is social competence. It serves as a foundation for the formation of subject and pedagogical competences.

All three components (social, subject and pedagogical competences) are interrelated and form a holistic structure in which social competence supports and develops the other elements. The pyramid model reflects the harmonious correlation of these components, emphasising their importance for successful professional activity of a teacher (Figure 1).

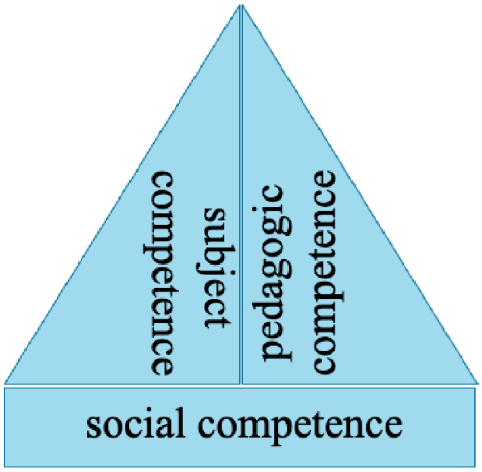

Figure 1. Pyramidal representation of the components of teacher's professional competence

DOI: 10.37943/19QLRX8424

The optimal form of the model of professional competence of a university teacher is represented as an isosceles triangle, where the preservation of the general shape, symmetry and proportionality of all parts are important. However, in practice, the model can often be broken due to insufficient development of one of the components (Figure 2). Violation of interrelationships or lack of development of individual competences leads to various distortions of the model. For example, Figure 2a shows problems with pedagogical competence, Figure 2b shows weak subject training, and Figure 2c shows insufficient social competence, reflecting deficiencies in the teacher's personality or behaviour.

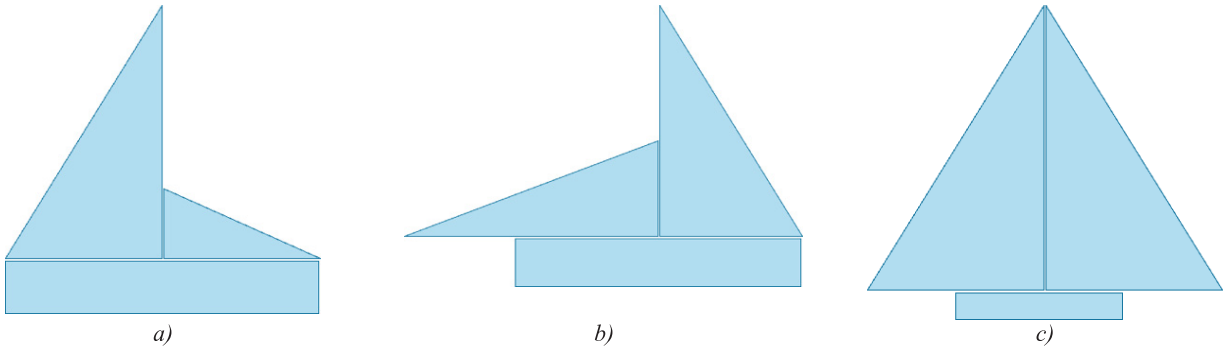

Figure 2. Examples of violations in the pyramidal competence model

In the structure of professional competence of a university teacher there are important functional interrelationships between three key components: subject, pedagogical and social competences.

1. The **interrelation of subject and pedagogical competences** is that subject competences include the system of knowledge of disciplines, and pedagogical competences include methods and techniques of teaching these disciplines.

2. The **interrelation of subject and social competences** is manifested in the fact that the formation of subject knowledge is closely related to the education of information culture and socialisation in the modern information society.

3. The **interrelation of pedagogical and social competences** is that pedagogical skills such as the use of teaching methods and tools are directly related to social competences such as love for children, sociability, tolerance and empathy.

In the competence model, the pedagogical and subject matter components are represented as rectangular triangles, where the cathetes symbolise the degree of competence development and their interrelationship with other components of the model. Hypotenuses in this case are not quantified, but the lengths of cathetes play an important role, which determine the level of development of certain competences and the degree of their harmonious interaction.

The functional essence of the model is that all three components of competence are formed in a complex, forming a balanced system. It is important to maintain this balance, as the lack of formation or insufficient development of one of the components can violate the overall structure of the model and reduce the effectiveness of the teacher's professional activity.

The work of the competence model in the real system of teachers' training on educational programmes of microqualifications will allow timely response to violations, adjust the purpose and content of professional training.

The multilevel of subject competences of a teacher is confirmed by the fact that it is impossible to master the entire base of scientific subject knowledge, which, one way or another, a computer science teacher can encounter in his professional activity as an IT-discipline teacher.

Scientific Journal of Astana IT University
ISSN (P): 2707-9031 ISSN (E): 2707-904X
VOLUME 19, SEPTEMBER 2024

In [19], the authors identified five levels of subject competences. Knowledge, skills, adaptation and innovation abilities, assessment skills and others were taken as criteria. Next, an evaluation scale was developed to reflect the levels of mastery of methodological competence skills. The scale was chosen to be both numerical and contain descriptions of the levels (e.g., advanced, proficient, expert, etc.).

In order to determine what a teacher should be and how to prepare him/her, it is necessary to present the components of his/her professional competence in a visual and functional form. It is important to achieve the maximum degree of formalisation and detailing of the teacher's competences. Professional competence can be considered as a system of knowledge, skills and abilities (KSA) in the field of specialisation of microqualification [20]. This system of Knowledge and Skills, in its turn, represents an array of competences that need to be developed for successful pedagogical and professional activity of a teacher. Also, the analysis of scientific literature and practical experience in the design of individual educational routes allowed us to identify the scheme of building a route for the development of professional competence of a university teacher, which is especially relevant in the conditions of changes and the emergence of new professions in the Atlas of new professions and competences of Kazakhstan [21].

Thus, the professional competence of a teacher can be structured, which allows us to quantitatively analyse and assess the level of its formation, as well as the quality of professional training. For this purpose, subject competences of a future teacher can be presented in the form of a matrix (Table 1). Each cell of the matrix contains a value that reflects a specific subject competence formed in a teacher, i.e. his/her knowledge, skills and abilities (KSA) [22] related to a certain didactic unit of the microqualification programme.

Each element of the KSA, conventionally denoted by the letter A, is defined by two indices: the first index (row number) indicates the teacher's level of subject competence, and the second (column number) indicates the specific knowledge element corresponding to the structure and content of the microqualification programme. This approach allows formalising the process of professional competence assessment and analysing the development of the teacher's required competences.

Table 1. General scheme of the matrix of subject competences of a teacher

	1	**2**	**3**	**…**	**j**
low	A_{11}	A_{12}	A_{13}	…	A_{1j}
acceptable	A_{21}	A_{22}	A_{23}	…	A_{2j}
average	A_{31}	A_{32}	A_{33}	…	A_{3j}
high	A_{41}	A_{42}	A_{43}	…	A_{4j}
advanced	A_{51}	A_{52}	A_{53}	…	A_{5j}

The number of columns in the matrix (labelled as t) can reach several thousand, as it reflects all subject competences required by the teacher at different levels. Some elements of the matrix, labelled as A_{ij}, may be equal to zero. This is due to the fact that not all sections of the course are studied at all levels and with the same degree of complexity. For example, the study of a course on object-oriented programming starts at the zero level in school and continues at more advanced and expert levels in the training of micro-qualification educational program's (EP). Accordingly, the matrix cells related to this topic will be empty at the initial levels (rows 1 and 2) (table 2, where $A_{1j} = 0$ and $A_{2j} = 0$).

DOI: 10.37943/19QLRX8424

Table 2. General scheme on the presence of specific subject matter competences at specific levels of course study

	…	j	…
low	…		…
acceptable	…		…
average	…	A_{3j}	…
high	…	A_{4j}	…
advanced	…	A_{5j}	…

If it is similarly presented all subject competences obtained during the study of the microqualification OP corresponding to each of the five levels of training, it will be got a scheme of formation of subject competences of a teacher. This scheme clearly shows when and where the study of each topic begins, as well as which topics are continued or completed at different levels. This allows us to more accurately design the content of the methodological system of teacher professional learning within the framework of the microqualifications programme.

Subject competences are formed in complex with other components of professional competence. Figure 3 schematically presents all three components of professional competence. In this model, subject and pedagogical competences are structured in the form of a matrix, and social competences are considered as a constantly developing context within which pedagogical and subject competences are formed and developed in harmony.

In Figure 3, the elements of the matrix, conventionally labelled as B_{ij}, represent the components of teacher's professional competence. For convenience of analysis, we introduce the following notations:

Sub_i – subject competences (1,2,3,...,j). And Sub_i corresponds to a specific value of A from the array presented in Table 1;

P_i – pedagogical competences (1,2,3,...,i);

S_i – social competences.

Then the component B_{ij} is represented as a function of Sub_i, P_i and S_i, namely:

$$B_{ij} = f(Sub_i, P_i, S_i).$$

Subject competences

Pedagogical competences		**1**	**2**	**3**	**…**	**j**
	1	B_{11}	B_{12}	B_{13}	…	B_{1j}
	2	B_{21}	B_{22}	B_{23}	…	B_{2j}
	3	B_{31}	B_{32}	B_{33}	…	B_{3j}
	…	…	…	…	…	…
	i	B_{i1}	B_{i2}	B_{i3}	…	B_{ij}

Social competences *- as an environment for the development of subject and pedagogical competences of a teacher*

Figure 3. General scheme of the matrix of professional competences of a teacher

Detailed examination of the matrix shown in Figure 3 is presented. In this model, along the horizontal line there are subject competences sorted by topics, and along the vertical line there are pedagogical competences formed by the teacher in accordance with the requirements of the learning outcomes of the microqualification programme. The column elements

Scientific Journal of Astana IT University
ISSN (P): 2707-9031 ISSN (E): 2707-904X
VOLUME 19, SEPTEMBER 2024

show how different pedagogical competences relate to the same subject competence, while the row elements show how one pedagogical competence applies to different subject competences. Each element of the matrix represents a minimum unit of professional competence that a teacher needs to develop in order to be fully professionalised.

Consider is given to the examples of elements B_{ij} using the following example: working on errors when converting numbers from binary to decimal is one element related to the pedagogical competence of error correction techniques. Then, another element from the same column is the use of an instructional video when learning about converting numbers from binary to decimal, which is also a pedagogical competence. If it is considered an element from the same row, it may relate to the use of a video to teach charting in spreadsheets. Thus, the examples address subject competences (translating numbers, constructing diagrams) and pedagogical competences (working on errors, using tutorials).

Social competences such as communication culture, love for children and neat appearance are always present in the learning process, providing the necessary context.

As can be seen from the examples, to solve a pedagogical task it is often necessary to use several elements of professional competence B_{ij}, building a certain trajectory of their application (Figure 4).

B_{11}	B_{12}	B_{13}	…	B_{1j}
B_{21}	B_{22}	B_{23}	…	B_{2j}
B_{31}	B_{32}	B_{33}	…	B_{3j}
…	…	…	…	…
B_{i1}	B_{i2}	B_{i3}	…	B_{ij}

$$PT_x = B_{31} \rightarrow B_{22} \rightarrow B_{32} \rightarrow B_{13} \rightarrow B_{21}$$

Figure 4. Example of a trajectory of professional competences utilisation in solving a pedagogical task (PT_x)

In order to successfully solve a pedagogical task, it is necessary to solve a number of subtasks, applying the basic elements of professional competences B_{ij}. Thus, the process of solving a pedagogical task can be represented as a chain, where each element corresponds to a certain basic professional competence. If at least one link of this chain is missing, i.e. if some basic competence is not formed, the teacher will not be able to fully solve the task. This underlines the importance of integrated formation of all necessary competences within the framework of educational programmes of microqualifications.

When designing the methodological system of professional training and retraining of teachers within the framework of educational programmes of microqualifications, it is taken as a basis a seven-component methodological system [23]. This system includes key elements aimed at the comprehensive development of teacher's professional competences, which allows for flexibility and adaptation of the educational process to the individual needs and goals of each teacher (Figure 5).

DOI: 10.37943/19QLRX8424

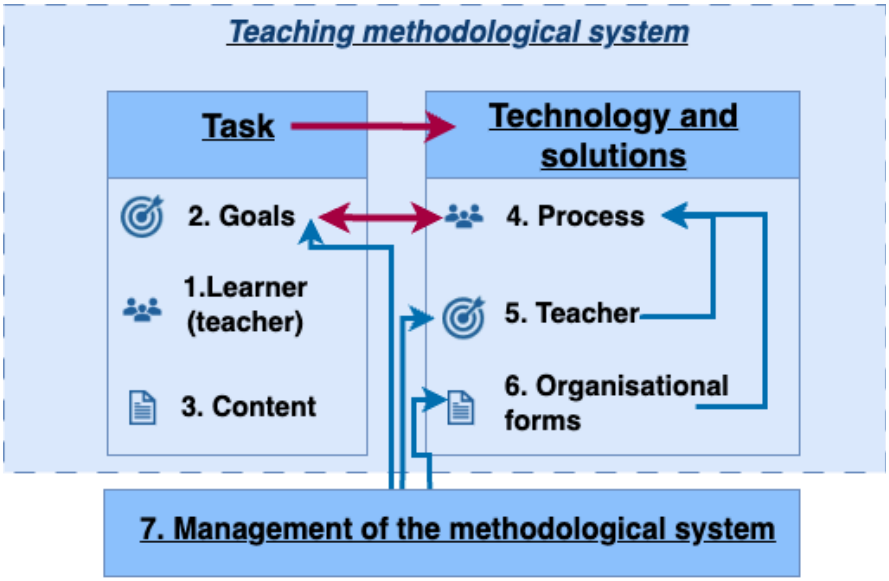

Figure 5. Model of methodological system of professional training and retraining of teachers within the framework of educational programmes of microqualifications

The essence of this model is as follows:

I. **Formation of the image of the "desired" teacher.** At this stage, the key goal of training based on the competency model is determined. An idea of what a teacher should be in order to effectively meet the modern requirements of the educational environment is formed. This includes not only subject knowledge, but also interpersonal skills, critical thinking, and digital literacy.

II. **Development of a microqualification educational program.** The program is developed as a system of basic professional competencies expressed through micro-objectives. Each micro-goal corresponds to a specific task, which allows the educator to easily track his/her progress and master the necessary skills step-by-step.

III. **Development of specialization courses.** Based on the micro-goal system, specialization courses are created. These courses are customized to meet the current requirements and specific needs of the target audience. The key point here is the integration of new technologies and teaching methods, which makes the process more interactive and engaging.

IV. **Selection of organizational forms and means of training.** Organizational forms and means of learning are selected according to the developed content. This may include both traditional methods, such as lectures and seminars, and innovative approaches, such as blended learning, distance courses and practical classes using educational technologies.

V. **Implementation of necessary educational technologies.** In order to implement the model, it is important to use modern educational technologies that will help to effectively deliver the material to students. This may include the use of online platforms, interactive applications, collaboration tools, etc. Such technologies not only improve the quality of learning, but also contribute to the development of teachers' skills in the digital environment.

VI. **Monitoring and adjustment of the learning process.** Continuous monitoring is carried out to control the learning process and to adjust educational routes depending on the needs of teachers. An important aspect of this stage is the collection of feedback from the participants of the process, which allows to identify weaknesses in the system and make changes based on real data.

The optimization task of the model is to predict the image of a learner who will not only be in demand in modern society, but will also be able to adapt to its future needs.

Scientific Journal of Astana IT University
ISSN (P): 2707-9031 ISSN (E): 2707-904X
VOLUME 19, SEPTEMBER 2024

Additionally, within this model it is also important to consider predefined goals and standard constraints. All educational programs must meet the established standards of educational quality. During the development phase, it is important to analyze the current norms and regulations to make sure that the program meets all requirements. In the process of implementing an educational program, it is necessary to be prepared for and adapt quickly to changes in the educational environment. This may require revising curricula, retraining teachers, and implementing new assessment methods. At each stage it is important to provide an individual approach to each teacher. The inclusion of diagnostic methods, as well as regular feedback, will help identify needs and adjust the educational process to maximize the satisfaction of teachers.

These elements of the model make it possible to create a dynamic and adaptive system of professional training and retraining of teachers, contributing to their development and improving the quality of the educational process.

Thus, the movement along the track can be non-linear and depends on the user's choice of the way to build an individual educational trajectory.

An individual educational track is a purposefully designed differentiated program that takes into account the professional and educational needs of a teacher, his/her abilities, interests and needs for professional self-realization [24], [25]. This approach allows university teachers to independently choose the trajectory of their professional development with the support of teachers and mentors.

The developed model was implemented and used in the information system of training (Figure 6), as a built-in module, which has the ability to take into account not only the predetermined goals and limitations of the standards, but also to optimally meet the individual needs of teachers.

In the model of methodological system of professional teacher training, it is important to take into account both predefined goals and standard constraints. The algorithm of their consideration consists of the following stages:

1. Defining the goals**.** At the first stage, specific educational goals are formulated based on the analysis of the needs of the target audience, changes in the labor market and current educational standards. This process includes collecting information on the requirements for the qualifications and skills of teachers and analyzing successful practices in other educational institutions.

2. Constraints analysis. The next step includes an assessment of existing constraints such as regulations and Ministry of Education requirements, resources available for program implementation (funding, staffing), and technological constraints related to the use of educational technologies. This step helps to identify barriers that may affect the success of educational program implementation.

3. Adjustment of programs**.** Based on the data collected, the curriculum and programs are adapted to meet both goals and constraints. This process includes the development of new courses and modules that meet current requirements and continuous monitoring of changes in the educational environment and adaptation of programs in response to these changes. Thus, the algorithm of taking into account predetermined goals and standard constraints creates a flexible and adaptive model of professional teacher education, which allows effective response to the challenges of the time.

Several key steps have been identified to determine how best to meet the individual needs of educators, which is a critical aspect of an effective educational model:

1. Individual diagnostics. The initial stage involves diagnosing educators' needs and preferences, which may include surveys and questionnaires to identify interests and professional

DOI: 10.37943/19QLRX8424

goals and individual interviews with educators to better understand their expectations and needs.

2. Personalization of learning. Based on the data collected, individualized learning trajectories are developed that take into account each educator's professional goals and competency level, as well as preferred teaching methods and course format (full-time, part-time, blended learning). Personalization of training contributes to deeper involvement of teachers in the educational process and increases their motivation.

3. Monitoring and evaluation**.** Regular monitoring of teachers' progress is carried out to ensure that individual needs are constantly met. This includes assessing the level of satisfaction with the educational process and adjusting educational routes based on feedback from teachers. This approach allows to create a dynamic educational environment that actively responds to the needs of teachers and promotes their professional development.

Figure 6. Home page of the information system

The system is designed to ensure effective interaction between its components, which include server part, interface and database.

Further, experimental work was carried out with university teachers: subject teachers – trainees, with different levels of teaching experience and specialisation. The results of the work were reflected in [19]. Diagnostics in this work includes several aspects:

1. Content aspect – it includes tests and check-ups of different nature, corresponding to the content of educational programmes of microqualifications.

2. Activity aspect – assessment of the performance of various types of practical tasks, such as the development of work programmes for the subject, drawing up technological maps of lessons and creating problem tasks.

3. Communicative aspect – based on questionnaires, testing, analysis and self-analysis, including the development of speech culture, behavioural skills in society, the ability to organise students' attention and work in groups.

When forming a set of diagnostic techniques, the emphasis was placed on methods that include self-diagnosis, which promotes self-knowledge and self-analysis of personality. The au-

Scientific Journal of Astana IT University
ISSN (P): 2707-9031 ISSN (E): 2707-904X
VOLUME 19, SEPTEMBER 2024

thors also noted that despite the diversity of definitions, all studies have a common semantic basis - the conformity of the labour market and social policy of the society. These parameters play a key role in determining the content side of competences, relying on psychological and biological features of the personality.

In the course of the study the validity of the methods used was tested and the results were presented, which indicate the need to develop recommendations to improve the level of methodological competence of university teachers within the framework of educational programmes of microqualifications.

Conclusion

In conclusion, it can be noted that the development of individual educational trajectories for university teachers, with a focus on invariant and variable modules, is an important element in improving their professional competence. A clear definition of the content of modules, forms of conducting classes, didactic materials, as well as rational distribution of time for mastering each part of the itinerary, allows to achieve flexibility and personalization in training. This approach contributes to the purposeful development of methodological competence of teachers, taking into account their individual needs, capabilities and professional goals. As a result, it improves the quality of teachers' training and their ability to effectively respond to modern challenges in education.

It is substantiated that the presented model of professional training and retraining of teachers in the field of information technologies and special professional education is universal for different specialties of pedagogical universities. It is adaptable to the conditions of a particular educational institution and the peculiarities of the composition of trainees. An important aspect of this model is its integration with educational programs of microqualifications, which allows to effectively form and develop key professional competencies of teachers at different levels of their professional training and retraining.

The model ensures the purposeful creation of educational programs that include micro objectives and relevant specialization courses, transformed depending on the needs of the educational process and the specifics of each educational organization. This approach allows to ensure that training and retraining programs meet modern requirements and expectations of society, and guarantees that trained teachers will have relevant and in-demand skills and knowledge.

Our study has identified three key stages of professional training and retraining of teachers, which play an important role in the formation of their professional competencies.

The first stage – basic training – includes receiving pedagogical education in higher education institutions. This stage emphasizes the formation of subject matter competencies, such as knowledge of pedagogical theories (including theories of learning and didactics), the basics of the psychology of learning and child development, and curriculum design and implementation. Basic training creates a solid foundation for further professional development and provides teachers with the necessary knowledge to work effectively in the educational environment.

The second stage, professional development, focuses on the continuous development of professional skills and updating knowledge. It includes professional development courses that help teachers to master modern teaching methods and technologies, as well as participation in seminars and conferences where current problems and achievements in the field of education are discussed. Professional internships aimed at applying new approaches in the educational process also play a significant role. This stage is an important tool that allows teachers to adapt to the changing requirements of the educational environment and improve the quality of teaching.

The third stage – retraining – provides an opportunity for teachers to change their specialty or profile in response to changes in the educational system or labor market requirements. Important aspects of retraining include learning new disciplines and teaching methods, developing interdisciplinary competencies that integrate knowledge from different fields, and supporting professional development through the creation of individualized educational pathways. Retraining helps educators stay relevant and competitive in a rapidly changing educational landscape.

Thus, the considered stages of professional training and retraining of teachers emphasize the need for a systematic approach to their development. This ensures not only their professional growth, but also meets modern requirements and challenges facing the education system.

References

[1] Akorda. (2023). President Kassym-Jomart Tokayev's State of the Nation Address "Economic course of a Just Kazakhstan". Retrieved from https://www.akorda.kz/ru/poslanie-glavy-gosudarstva-kasym-zhomarta-tokaeva-narodu-kazahstana-ekonomicheskiy-kurs-spravedlivogo-kazahstana-18588

[2] Antera S. Professional Competence of Vocational Teachers: a Conceptual Review // Vocations and Learning (2021) 14:459–479 https://doi.org/10.1007/s12186-021-09271-7

[3] Sharifbaeva, K., Niyazova, G., Abdurazzakova, D., Abdurashidov, I., Alimardonov, R. (2022). Formation of methodical competence of special subjects teachers in technical universities. AIP Conference Proceedings. doi: https://doi.org/10.1063/5.0089618

[4] Yermolenko, A., Kulishov, V., Shevchuk, S. (2020). Innovative principles of development of methodical competence of modern teacher of vocational education. Fundamental and Applied Research in Practice of Leading Scientific Schools, 38 (2), 113–118. doi: https://doi.org/10.33531/farplss.2020.2.20

[5] Windl E., Dammerer J. Teacher Training in Austria with special consideration of Mentoring in the induction phase // Education and Self Development. – 2019. – Vol. 14. – № 3. – P. 40–47.

[6] Toxanov, S., Abzhanova, D., Mukhatayev, A., Biloshchytskyi, A., Biloshchytska, S. Education Sciences, 2024, 14(7), P.-748. https://doi.org/10.3390/educsci14070748

[7] Nesbitt, K.T., & Farran, D.C. (2021). Effects of prekindergarten curricula: Tools of the Mind as a case study. Monographs of the Society for Research in Child Development, 86(1).

[8] Hikida, M., Chamberlain, K., Tily, S., Daly-Lesch, A., Warner, J.R., & Schallert, D.L. (2019). Reviewing how preservice teachers are prepared to teach reading processes: What the literature suggests and overlooks. Journal of Literacy Research, 51(2), 177–195. doi:10.1177/1086296X19833297

[9] Hopkins, S.L., Round, P.N., & Barley, K.D. (2018). Preparing beginning teachers for inclusion: Designing and assessing supplementary fieldwork experiences. Teachers and Teaching, 24, 915-930. https://doi.org/10.1080/13540602.2018.14 95624

[10] A.A. Biloshchytskyi, S.M. Omirbayev, A.A. Mukhataev , O. Kuchanskyi, S. Biloshchytska, Y. Andrashko, S.N. Toxanov и A.R. Faizullin, «A structural model for building a system for the development of methodological competence and methods for evaluating its effectiveness,» *Eastern-European Journal of Enterprise Technologies ISSN 1729-3774, 5 (3 (125)),* pp. 6-22, 2023.

[11] Biloshchytskyi, A., Omirbayev, S., Mukhatayev, A., Toxanov, S., Kassenov, K., Faizullin A. , "Research on the formation level of methodological competence of it disciplines teachers", ATIT 2020 – Proceedings: 2020 2nd IEEE International Conference on Advanced Trends in Information Theory, 2020, pp. 242–245, https://doi.org/10.1109/ATIT50783.2020.9349337

[12] Hoffman, J. V., Svrcek, N., Lammert, C., Daly-Lesch, A., Steinitz, E., Greeter, E., & DeJulio, S. (2019). A research review of literacy tutoring and mentoring in initial teacher preparation: Toward practices that can transform teaching. Journal of Literacy Research, 51, 233–251. https://doi.org/10.1177/1086296X19833292

Scientific Journal of Astana IT University
ISSN (P): 2707-9031 ISSN (E): 2707-904X
VOLUME 19, SEPTEMBER 2024

[13] Aleksieienko-Lemovska, L. (2022). Methodological competence development of preschool teachers in the system of continuous education. Scientific Journal of Polonia University, 53 (4), 9–20. doi: https://doi.org/10.23856/5301
[14] Hammer, T., Lewis, A. L. (2023). Which competencies should be fostered in education for sustainable development at higher education institutions? Findings from the evaluation of the study programs at the University of Bern, Switzerland. Discover Sustainabi-lity, 4 (1). doi: https://doi.org/10.1007/s43621-023-00134-w
[15] Agapov, A.M., Mysina, T.Yu. (2022). The Relationship of Subject-Methodological Skills, Analytical and Communicative Compe-tencies of Pedagogical Students. European Proceedings of Educational Sciences. doi: https://doi.org/10.15405/epes.22043.6
[16] Ngang T.K. The importance of soft skills acquisition by teachers in highereducation institutions / Kasetsart Journal of Social Sciences. 2018. p. 1–6. DOI 10.1016/j.kjss.2018.01.002
[17] Windl E., Dammerer J. Teacher Training in Austria with special consideration of Mentoring in the induction phase // Education and Self Development. – 2019. – Vol. 14. – № 3. – P. 40–47.
[18] On Approval of State Obligatory Standards for Higher and Postgraduate Education (2022). Retrieved fromhttps://adilet.zan.kz/rus/docs/V2200028916
[19] Toxanov, S., Abzhanova, D., Biloshchytskyi, A., Mukhatayev, A., Kassenov, Kh. (2024) Methodology for assessing the level of methodological competence of IT teachers. Scientific Journal of Astana IT University (2024), 18, 120–130. https://doi.org/10.37943/18BTZP2235
[20] Omirbayev S. (2023) Retrieved from https://enic-kazakhstan.edu.kz/files/1679046225/5-omirbaev-s-m-o-razrabotke-i-realizacii-programm-mikrokvalifikaciy.pdf
[21] Atlas of new professions and competences of Kazakhstan (2020). Retrieved from https://atlas.bts-education.kz/
[22] Freddano M., Pandolfini V. Teacher Training on Data Literacy for School Evaluation and Improvement: A Teacher Professional Development Experience in Italy // Education and Self Development. – 2022. – Vol. 17. – № 1. – P. 89–98.
[23] Darnton G. (2023) Likert scales and questions: uses and abuses // European Conference on Research Methodology for Business and Management Studies. 22(1):44-49 DOI: 10.34190/ecrm.22.1.1748
[24] Maruf M. (2023) Alternative approach to analysing data obtained with likert scale // Route Educational and Social Science Journal. 10(5):96. DOI:0.17121/ressjournal.3439
[25] Xu, H., Kuchansky, A., Gladka, M. (2021). Devising an individually oriented method for selection of scientific activity subjects for implementing scientific projects based on scientometric analysis. Eastern-European Journal of Enterprise Technologies, 6 (3 (114)), 93–100. doi: https://doi.org/10.15587/1729-4061.2021.248040