

Mastering scientific integration in a higher educational institution

Mukhabbat Fayziyeva^{1*}, *Nilufar Rasulova*¹, *Nigora Mukhamedova*¹, *Bakhrudin Eshdavlatov*¹, *Madina Odilova*¹ and *Nargiza Kholikova*²

¹Tashkent Pediatric Medical Institute, Tashkent, Uzbekistan

²Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, National Research University, Tashkent, Uzbekistan

Abstract. The article presents the developed personality-oriented model of professional development of teaching staff of technical universities on the basis of a personality-oriented approach, the results of testing a variable" model on the example of the organization of the development of professional competence of teachers with different levels of qualifications, experience and education, tools for diagnosing the initial, current, final state of pedagogical activity and personality of teachers and the entire teaching staff.

1 Introduction

The learning process in higher education is implemented within the framework of a diverse holistic system of organizational forms and teaching methods. The forms of the educational process in higher education include lectures, seminars and practical classes, laboratory classes, educational conferences, educational industrial practice, term papers and theses, self-education of students.

In the process of self-education, there is a specific acquaintance with the subject, secondary study, analysis and self-assessment of the results. The result of self-education should be new knowledge, skills and abilities, the application of acquired knowledge in practice. The main methods of self-education include independent work on literature. This method forms the ability to navigate the flow of information, find the right information, evaluate it correctly, use this information in professional activities. Based on the information received, methods such as the exercise itself and self-training can be applied. The use of these methods makes it possible to develop and consolidate the qualities necessary for practical activity [1-4].

Practice is an essential component of teaching students specialties in professional colleges. Educational practice based on the curriculum, to consolidate theoretical knowledge in general education and special subjects, to study working methods and to improve the skills of students, is conducted under the supervision of the head of practice in workshops, laboratories and landfills.

The purpose of the practical classes is to consolidate the knowledge and fundamentals obtained during the theoretical lectures, the clerical work of students. During the practice,

* Corresponding author: Fayziyeva1936@mail.ru

the student must independently work on deepening his theoretical knowledge and improving practical skills, as well as acquire practical skills on a wide range of issues. To deepen the integration of education and science at Tashkent State Agrarian University, great importance is attached to the development of the university science sector.

The Tashkent Institute of Irrigation and Agricultural Mechanization Engineers at the National Research University has developed a certain system of measures for the integration of education and science, which includes the following activities: wide involvement of teachers and students in various forms of research and scientific creativity; search for gifted youth and their support; training of highly qualified scientific and pedagogical personnel; development of close multilateral cooperation of the higher educational institution with academic and branch agricultural research institutions of the republic. For the effective inclusion of science in the personnel training system, it is necessary to implement and timely introduce the results of scientific research into the educational process. World experience shows that the agricultural sector is most effective in countries where agricultural science is well developed, which gives reasonable recommendations for improving the competitiveness of manufactured products [5-8].

In modern conditions of rapid development of scientific and technological progress, intensive increase in the volume of scientific and scientific and technical information, rapid turnover and updating of knowledge, the training of highly qualified specialists in higher education with high general scientific and professional training, capable of independent creative work, to introduce the latest and progressive technologies into the production process is of particular importance.

2 Methods

The personality-oriented approach to the education process was carried out taking into account individualization, in which the following structural components were identified

- * goals: increasing the level of competence of each teacher:
- * establishing the initial state of competence of the teacher;
- * definition of an impact program that provides for the main directions of correction and development of the teacher's activity and personality (drawing up an individual development trajectory);
- * providing information about the intermediate state of the teacher's activity and personality (providing systematic feedback);
- * ensuring the processing of information received through the feedback channel, the development of corrective (regulatory) measures and ways to implement them.

We used these components in the design of a personality-oriented model of professional development of teaching staff of a professional lyceum. Having analyzed the main directions of the competence approach implementation, participating in scientific and practical conferences and seminars on the development of standards on a modular competence basis, we determined that in the conditions of standards development, it is possible to conduct an independent analysis of some specialties and, without claiming to be the completeness of research, to identify the most significant professional competencies of students and organize methodological work on the development of pedagogical technologies that ensure their formation [9].

Thus, within the framework of personality-oriented methodological work aimed at the development of pedagogical activity and the personality of teachers, as well as at improving the professional competence of lyceum teachers, a proactive approach was developed in the organization of the use of pedagogical technologies had a dual purpose:

1. Correctional: identification and elimination of difficulties in the pedagogical activity of specific teachers based on the development of pedagogical technologies.

2. Prognostic, carried out in two directions: the identification of new difficulties of teachers in the organization of theoretical training and educational and production activities and the selection of appropriate technologies to eliminate them; the choice of undeveloped skills, skills and competencies of students and the selection of technologies that form them.

Such gradual development of pedagogical technologies, their systematization, from the point of view of conscious application, is the basis for the formation of the readiness of the teaching staff and each teacher to transition from the traditional organization of the educational process to competence-based learning.

The developed model of professional development of teachers, based on monitoring, consists of 3 stages.

Stage 1: preparatory. One of the most important elements of the structure of the variable personality-oriented model of professional development is the specification of the objectives of methodological work at the stage of transition to competence-oriented education. In the study, the objectives of professional development are defined through: the typology of difficulties in professional activity, communicative and personal blocks; the allocation of key professional competencies of students in a number of professions and pedagogical technologies that form them. This approach to goal-setting when discussing them with teachers allows them to understand and accept the goals and the final result of professional development, organize an effective process of professional development, highlighting the criteria for the development of pedagogical activity and the personality of the teacher and defining the parameters of the development of professionalism. Achieving these goals requires modeling the organization of the process of professional development of teaching staff of a professional lyceum.

Modeling of the professional development process can be considered optimal if the work is carried out in the following areas:

- the target table highlights a number of skills, skills, and competencies that teachers can form with the same technology, and we plan to implement it in this cycle;
- it is advisable to allocate groups in the teaching staff: with experience from 0 to 5 years; from 5 to 10 years; more than 10 years and a group of teachers without pedagogical education, taking into account the ratio of typical difficulties inherent in the selected groups and personal difficulties of the teacher in the organization of theoretical training and educational and production activities. There are much more difficulties in the typology than can be eliminated in one cycle of methodological work to improve the professional competence of teachers, therefore it is necessary to limit and specify those difficulties that can be eliminated by the same pedagogical technologies that they master to form specific competencies in students.;
- information support of the educational process begins with author's programs, which are gradually developed on the basis of content modeling technology and modular technologies. The program determines the number of hours that is needed to study each module. The allocation of hours requires separate testing, because it can be adequate or inadequate to the goals set, and is determined by the complexity of competence and the effectiveness of the applied pedagogical technology. Teachers are engaged in the creation of an electronic textbook, a methodological guide on the subject; workbooks, develop training exercises and other forms that ensure the formation of the competence being worked out by students; in order to switch to competence-based education, correction and development of pedagogical activity and personality of the teacher is necessary, which requires clear step-by-step planning, a personality-oriented approach and monitoring organization;
- to determine the effectiveness of teachers' professional development, monitoring tools are being developed to determine at the stage of entrance, current, and final control, the dynamics of the development of professional competence, pedagogical activity, the personality of the teacher.;

- for the organization of a personality-oriented approach to the professional development of teachers and the implementation of the activity principle in its organization, it is necessary to choose a set of methods and forms, training sessions for the development of pedagogical technologies. The activity of a teacher in the monitoring mode has a cyclical nature, is carried out strictly in stages with regular monitoring of completed tasks and mastered types of pedagogical activity.

Stage 2: practical. The implementation of the simulated process of professional development of teachers is carried out. For the effective development of pedagogical activity and the personality of a teacher, their initial state is important, i.e. how ready they are to master pedagogical technologies and development. At this stage, the need for correction of pedagogical technique and personality qualities necessary for the qualitative performance of pedagogical activity is revealed. The compliance of the level of development of the teaching staff with modern requirements is investigated. To identify the initial state, questionnaires, observation, conversation, testing, and other forms of control and collection of information are used to optimize methodological work to improve the qualifications of teachers.

Monitoring is carried out by monitoring the intermediate states of the system of parameters, the development of professional competence of teachers, which are measured in points. According to these parameters, the initial diagram of the state of the teacher and the entire teaching staff is built.

The final state of the development of pedagogical activity and the personality of the teacher is determined by the degree of achievement of the planned results of professional development of teachers, through the comparison of the goal and the final result. Diagnostics is carried out according to the selected parameters and a table of the development of the teaching staff and a repeated diagram are constructed, according to which the presence or absence of dynamics in the development of pedagogical activity and the personality of the teacher is determined.

Stage 3: analytical. In order to activate the mechanism of responding to the information received and using it to predict the possible development of the teacher training model, its correction, to repeat the cycle of professional competence development and formation of readiness for the transition to competence-oriented education, an analysis of the results obtained is necessary. Therefore, the variable model of teachers' professional development includes monitoring tools for processing the information received

- analysis of typical difficulties of teachers and the dynamics of their elimination;
- individual teacher development plans and the program for the development of the teaching staff used in the study.

Based on the analysis of the monitoring results, recommendations are developed for each teacher, for groups of teachers with different teaching experience and for the entire teaching staff, and work plans are drawn up for professional development for various groups of teachers. Thus, the transition to the 1st stage of the personality-oriented model means the beginning of a new cycle of professional development, which further eliminates the difficulties of teachers, clarifying the acquired competencies of students and pedagogical technologies. The repeated use of professional development monitoring in the context of the transition to competence-based education makes it possible to improve the organization of methodological work, develops pedagogical activity and contributes to the objectivity of evaluating the effectiveness of the work carried out.

Competence is a qualification characteristic of an individual at the time of his inclusion in professional activity: the ability to mobilize and implement knowledge, skills and behavioral relationships in a specific professional situation. The variety of available options for the designation of the definition of "competence" and its derivatives indicates that all these definitions include numerous personal parameters: motives, distinctive properties, abilities, etc. of an individual, characterizing a representative of a certain profession.

So, competencies are a set of tasks that a specialist must solve, and competence is a set of competencies that he must possess. Competence is a kind of integrative complex characteristic of a personality, its ability to solve specific practical problems arising in various spheres of life. The importance of the competence approach is that it involves the transition from the assessment of knowledge to the assessment of competencies.

Thus, the theoretical justification of the features of the development of cultural competence of teachers in the system of advanced training is based on the following approaches: systemic, activity-based, personality-oriented. To reveal the features of the development of cultural competence of teachers in the system of professional development, the most significant is the cultural approach, which consists in considering, along with the competence, that the basic factor of professional and personal development of teachers in the model "education throughout life" is the formation of their own professional and general personal competence.

The implementation of the competence approach is a set of actions through which the formation of competencies is carried out during the learning process, their assessment: the formation of competencies by modules; the level differentiation of students' competencies and their presentation in the form of a competence schedule; the definition of all types of training sessions (both classroom and independent), on the basis of which competencies are supposed to be formed; the construction and organization of the educational process focused on the formation of competencies; building competency assessment systems and their components, including the development of assessment methods and procedures, the choice of means for documenting learning outcomes.

An agricultural specialist should have not only deep professional training, but also certain research skills. He should be able to generalize best practices, check various complexes and individual new machines in economic conditions, identify the most rational forms of using technology. The process of studying in a higher educational institution today should increasingly rely on the independent, close to the research activity of the student.

It should be noted that the theory of learning considers not only the tasks of generalization and justification, but also the tasks of development and foresight. When studying disciplines, the goal is to form students' needs and skills to use its scientific content in the future, and not the scientific knowledge itself at the level of their memorization. It is necessary to consolidate the holistic pedagogical content, which allows the use of academic disciplines as a methodological, theoretical means of problem research. This is required by the modern level of integration development, which becomes the direct productive force of society, efforts are directed to accelerate the introduction of scientific achievements into the national economy of the republic.

The training system should assume a reorientation to scientific and pedagogical ways of developing their activities, taking into account the peculiarities of student activity at the university. Unlike schoolchildren, student academic work combines learning and creative scientific and professional training with a high degree of independence. Therefore, teaching in higher education should be aimed at developing students' creative thinking, at organizing their optimal mental activity. This is primarily due to the fact that university graduates should not only have a qualified understanding of special and scientific information, but also put and defend their ideas and proposals. In accordance with these principles, the content, structure and technology of higher education are designed. The rational ratio of general scientific, general professional and special training, fundamental and applied education, theoretical and practical training is determined (Table 1). The educational process in higher education is primarily based on the accumulated experience and material, on the assessment of the practice of the educational process, then the connections of the elements that make up the educational process are established, it is the relationship of these principles that

Table 1. Approaches to improving the professional competence of teachers of specialized sciences

Activity content	Written description
Content of the educational practice process	To acquaint the audience with the changes in the system of professional development, mutual respect, the organization of favorable ergonomic conditions for adaptation to the new social environment
Choosing the optimal training material	Specialty sani onituvchili pedagogy mahorat, pedoglik bilim, doklar pedagogical profile roof dolinashuv, face figs vinyl sifatlar nanotlar intellectual audience, khujaligida foidalaniliaetgan ilgori technologik and technician means, ularni tanlash and technicians ishlatishishda localized means of legal accreditation oligarch
Educational methods and forms	Further development of methods of reproductive education, which are formed in the listeners, is perseverance, ability to perform tasks on time, concentration of attention. In the educational system, the wider use of methods of motivation, along with teaching to work in such directions as demand and control, fellowship with the opinion of other people.
Forms of Education	In theory and practice, in contrast to traditional forms of training, work in small groups, dual performance, individual performance, the use of keys techniques and other forms of productivity. This course gives students confidence that they will become leaders in the educational process, that is, they will be active in the lesson and will be able to radically change later in the transition to specific subjects.
Control of the effectiveness of Education	Audience: a)an increase in the quality of their pedagogical knowledge; b) the development of skills and skills; C) the ability to behave in training and control the fluency of their speech; d) the ability to give strong motivation to the next training session; D) the control of such qualities as reflection, the ability of listeners to interact with educational activities.

Provides a meaningful basis, scientific certainty and objectivity of the theory of learning. Consequently, the defining feature of higher school education improvement is the relationship between theory and practical activity. Therefore, in the activities of a modern higher educational institution, it is important to shift the emphasis to the scientific component of the qualification of teachers. It is the scientific orientation, the formulation and search for solutions to new problems and the determination of optimal directions for the development of science and technology that form the basis for teaching a particular subject at a university. In this regard, each teacher of a higher educational institution has a task, first of all, to teach students the ability to form knowledge and skills of using scientific research methods, independent acquisition of creative abilities.

3 Results and discussion

Teaching at the university is a system of organization and management of cognitive activity of students. However, a distinctive feature of the university is that when mastering the basics of science, students' independence in acquiring knowledge prevails, which implies the presence and development of appropriate abilities and skills. Among the many issues related to the independent search and formation of effective knowledge among students, the main ones are the preparation of students for the independent search for scientific and applied information, and the connection of educational activities with scientific search and the solution of problems of the development of relevant industrial activities. Teaching students to think in this scientific field and related fields of knowledge and practical tasks becomes a priority in the methodology of teaching activities of university teachers. An indispensable

condition for the effective study of subjects is the students' understanding of the system of theoretical knowledge and their practical readiness, a deep interest in studying a particular subject.

The effectiveness of continuous professionalization depends on compliance with the pedagogical condition of preserving the logical sequence of the stages of professionalization from normative to transformative and creative. This determines both the pedagogical and scientific field of activity of teachers with priority for research work. Thus, when solving the problem of the formation of pedagogical skills of teachers of a higher educational institution, it is necessary to observe the following conditions that ensure efficiency:

- high qualification of the teacher as a specialist scientist;
- the need for pedagogical activity, the development of pedagogical vocation;
- focus on permanent scientific and pedagogical improvement.

The following are named as the main ways to develop the integration of education and science in the National Training Program: implementation and activation of scientific research in the field of education and training; ensuring links between pedagogical and research processes and all-round support for scientific and technical creativity of young people. In higher education, education and science are inseparable - high quality education cannot be achieved without using a high level of science development.

Learning is the process of changing a person's thinking. While studying, they acquire something that changes their vision of the world and themselves, which gives them some new qualities that they did not possess before, it kind of changes the reality in which a person is. Therefore, in the most general form, learning can be considered as a change in perceived reality. Teaching should play the role of a means in it, while it is necessary to eliminate the gap between teaching and learning requirements.

References

1. L. R. Halverson, C. R. Graham, K. J. Spring, J. S. Drysdale, C. R. Henrie, A thematic analysis of the most highly cited scholarship in the first decade of blended learning research, *The Internet and Higher Education*, **20**, 20-34 (2014)
2. C. T. Procter, *Blended Learning in Practice, Education in a Changing Environment Conference Proceedings* (2003)
3. A. A. Akhayan, *Virtual pedagogical university, theory of formation, STD, Corypheus*, (2001)
4. V. V. Serikov, *Education and personality: Theory and practice of designing pedagogical systems*, Moscow: Logos, **271**, 91 (1999)
5. E. E. Smirnova, *Formation of models with higher education*, Tomsk, **132**, 92 (1984)
6. O. Glovatskii, J. Rashidov, B. Kholbutaev, K. Tychiev *Achieving reliability and energy savings in operate of pumping stations*. In *E3S Web of Conferences, EDP Sciences*, 264 (2021)
7. K. Zukhra, O. R. Ismailova, D. Jamoldinova, O. Khimmataliev, J. O. Khakimov, O. O. Daminov, *Use of the Art of Management in Improving the Teaching Skills and Pedagogical Techniques of the Modern Teacher Solid State Technology Volume: 63 Issue: 2 Publication Competent model of Practice-oriented education of students of the construction profile*. *Journal of Critical Reviews. Innovare Academics Sciences Pvt. Ltd.*, 258-267 (2020)
8. B. Khasanov, R. Choriev, A. Tillaev, T. Mirzaev, *Fundamentals of property and compositions management concrete mix and concrete* *E3S Web of Conferences* (2021)

9. Sh.A. Mirsagatov, I.B. Sapaev. Photoelectric and Electrical Properties of a Reverse - Biased p-Si/n-CdS/n⁺-CdS Heterostructure, *Inorganic Materials*, **50(5)**, 437–442 (2014)