

To the question of professional competence of the future teacher of chemistry

Gulzhan Zholaushievna Niyazova, Kamalbek Meirbekovich Berkimbaev, Rabiga Esimovna Praliev , Dinara Kadir Khanovna Berdi and Alina Kuandykovna Bimaganbetova

Ahmet Yasawi International Kazakh-Turkish University, B. Momysuly Street, 65, 161 400, Kentau, Kazakhstan
ngulzhan00@mail.ru

Abstract: Distinctive for our time changes in the nature of education in its focus, aims, content - is increasingly orientating it on the «free development of man», the creative initiative and independence of the trainees, competitiveness, mobility of the future specialists. The developed technology of formation of professional competence of students of the specialty 5B011200-Chemistry based on use of interactive educational technologies is a set of methods and techniques that provide the most effective mastering of educational material in simulated conditions of professional activity. In this case provided interdisciplinary links and continuity in the continuous vocational training during the whole period of study, and the content of interactive learning is based on the principle of modularity, which allows to build a logically completed and independent units in accordance with the set educational objectives, that allows to combine traditional methods of teaching and modern educational technologies, that provide high level of professional knowledge. At the same time respecting the basic principles of didactics, creates a comfortable psychological environment and an individual approach to each student.

[Niyazova G.Z., Kamalbek Meirbekovich Berkimbaev K.M., Rabiga Esimovna Praliev R.S., Dinara Kadir Khanovna Berdi D.K., Alina Kuandykovna Bimaganbetova A.K. **To the question of professional competence of the future teacher of chemistry.** *Life Sci J* 2013;10(9s):193-197] (ISSN:1097-8135).
<http://www.lifesciencesite.com>. 24

Keywords: competence approach, pedagogical conditions, professional competence, methods of training.

1. Introduction

One of the tasks of the state program of education development of the Republic of Kazakhstan within 2011-2020 is preparation of highly skilled scientific and pedagogical staff [1].

The development of education does more and more actual a solution of the problem of an assessment of professionalism of the teacher, level of his professional competence, prospects of growth, opportunities of professional growth.

Distinctive for our time changes in the nature of education in its focus, aims, content is increasingly orientating it on the «free development of a person», the creative initiative and independence of the trainees, competitiveness, mobility of future specialists. These accumulating changes mean, essentially, the process of changing the educational paradigm.

However happening in the world and Kazakhstan changes in the field of education, attributable, in particular, with the global task of providing the entry of a person into the social world, his productive adaptation in it, cause the necessity of raising the issue of provision of education more complete, personally and socially integrated result [2]. The concept "competence/competence" also acted as the general definition of such integrated social-and-personal-and behavioural phenomenon as result of

education in aggregate motivational- valuable, cognitive components.

In modern domestic pedagogics the various approaches underlying the training of specialists are known. Among them is as already known and settled (traditional, system, activity, personal- focused, personal-activity), and new, entered into a scientific turn rather recently. Competence-based approach concerns to the last.

If to speak about practice of professional education, there is divergence between quality of preparation of the graduate given by the educational institution, and the demands made to the specialist by production, by employers[3].

In the conditions of updating of the higher pedagogical education, its construction on the basis of competence-based approach, training in disciplines of subject/profile preparation in chemistry in pedagogical higher education institution has to answer the purpose of formation of professional competence of the student.

Actuality of the research: changes occurring in the modern education system result in necessity to increase the qualification and professionalism of teachers, i.t. his professional competence. The main aim of the modern education is compliance with the actual and perspective needs of the person, society and state, preparation of comprehensively developed personality of a citizen of his country, capable to

social adaptation in the society, the beginning of the labour activity, self-education and self-improvement. And a free-thinking, predicting result of his activities and modeling educational process teacher is a guarantee to achieve the set goals. That is why now it is sharply increased the demand for skilled, creative thinking, competitive teacher's personality able to educate the individual in the contemporary, dynamically changing world.

2. Methods of research

Methods of research: theoretical analysis and synthesis, comparison and synthesis, modeling, study of the experience of professional activity of the future teacher of chemistry, observation. The technique of experimental work on the testing of this model; the indicators and criteria to assess the effectiveness of the revealed conditions were defined; pedagogical experiment was held; training- and-methodological support of the competence-oriented educational process of professional preparation of future teachers of chemistry was developed, directed on formation of professional competences of the graduates; empirical research methods were used.

The purpose of research is to theoretically justify and experimentally check the effectiveness of the detected pedagogical conditions in the formation of professional competence of future teachers of chemistry.

Subject of research: to reveal the pedagogical conditions of forming of professional competence of the future teacher.

Research objectives: to analyze development of the process of forming of professional competence of future teachers of chemistry at high schools, to determine the extent of its theoretical and practical elaboration on the basis of experimental test and analysis of the comparison of the experimental and control groups of trainees of the Department «Ecology and chemistry» of the Engineering-pedagogical faculty of the International Kazakh-Turkish university by Ahmet Yasawi, on a specialty 5B011200-Chemistry; to justify the necessity of formation of professional competence as a component of the professionally-oriented training of future teachers, define the basic criteria, indicators and levels of professional competence of future teachers, develop and test a model of the process of forming of professional competence of future teachers.

3. The main part

Didactical possibilities of interactive teaching chemical disciplines based on the strategy of the active student participation in knowledge and experience getting process, interaction with the teaching environment, cooperation, and development of reflexive and critical thinking allow to consider it as an effective means to form professional

competence of chemical specialties students of pedagogical institutes.

The conducted analysis of psychological-pedagogical and methodical literature shows that there is still not offered a modern scientifically grounded methodological training system of chemical disciplines for students of pedagogical higher education institutes holistically using didactic potential of interactive teaching and implementing the methodology of a competence approach. In the theory and methodology of teaching chemistry the task of creating the concept and methodology of interactive teaching chemical disciplines were not put and not developed.

In the framework of our problems (formation of professional competence of the future teachers) this means to teach future teachers professionally solve different pedagogical problems, starting with the special tasks as a teacher of the particular discipline, ending with the organizational and communicative tasks of general professional nature. Special importance is given to the formation of future teachers of general pedagogical skills, as they are the foundation of professional education, without which it is impossible to grow professionally.

The introduction of interactive forms of education is one of the most important directions of improving the training of students in modern higher school. Nowadays the main methodological innovations are connected with the use of interactive teaching methods.

The analysis of the theoretical researches and practical experience of modern pedagogical activity shows that despite much attention to training of pedagogical staff, the problem of detection of pedagogical conditions as a factor of formation of professional competence of future teachers remains poorly studied.

In the modern system of education the essential quality of the teacher must be his professional competence, that is, awareness and credibility in this or that sphere of his activity. The psychological aspect of the professional pedagogical competence is defined as owning by a teacher of the necessary amount of knowledge, skills and abilities determining readiness of his pedagogical activity, pedagogical communication and personality of the teacher as the bearer of certain values, ideals and pedagogical awareness. It is known that competence being an integral characteristic of the person is determined by a set of competencies. Under special professional competence of students taught in the direction of chemical-pedagogical preparation, we will understand the predictable result of education, which includes the system of fundamental chemical knowledge, methods, practical activities (skills) and motivational value

relations (personality) in the subject area (physical chemistry) needed for a productive professional (chemical-pedagogical) activity.

Interactive teaching is a special form of the organization of cognitive activity. It has very specific and projected goals. One of these goals is to create comfortable conditions for training such under which a student feels his success, his intellectual capacity that makes the teaching process itself productive and gives opportunity to each student to develop their creativity and self-actualization as a personality [1, 2].

In interactive teaching chemical disciplines teaching methods specially developed by us, as well as the general methods of chemistry teaching adapted in the context of the leading ideas of the concept of interactive teaching [3, 4].

You can define the following pedagogical conditions increasing the efficiency of use of interactive technologies of training in the development of creative capabilities of students – these are gradual assimilation of knowledge, skills, and development of creative abilities of students; accounting principles of personal-oriented approach to education; professional orientation of training; activation of creative activity of students; pedagogic of cooperation with the organization of the teaching process; structuring of the teaching content based on the relationship of intellectual and creative abilities of students via the gradual implementation of the dialog forms and methods; use of interactive teaching technologies in the educational process comprehensively as integrated set of didactic, psychological, and methodological procedures [5]. The technology of interactive teaching is successfully used to consolidate the taken material; when solving theoretical problems; when getting different ways to solve problems [6].

In International Kazakh-Turkish University named after Ahmet Yasawi during the research of features of the process of quality improvement of professional preparation of students of specialty 5B011200-Chemistry when studying disciplines of a basic cycle it was found out by us that formation of professional competence of students becomes possible, if:

- the process of professional preparation imitates the professional space suited to the model of a graduate;
- the content of future professional activity is structured on the basis of environmental and personal-focused approaches providing conditions to form professional competence of future specialists;
- the interactive environment places students into professional space promoting formation of professional competence and reducing terms of adaptation to labor activity;
- indicators of an assessment of effectiveness

system of students preparation to professional activity are developed by means of interactive educational technologies [7, 8].

Carried out at International Kazakh-Turkish University by Ahmed Yasawi experimental work shows that it is necessary to consider the use of «interactive educational technologies in higher professional school should be understood not teaching students the fundamentals of Informatics», but a complex transformation of the information educational environment in which the student is taught, creation of new means for professional development, active creative activity.

Methods of application of the interactive technologies influencing on quality improvement of professional training are various: from mastering new terminology to computer modeling and carrying out virtual experiments. Interactive environment significantly lighten the realization of pedagogically substantiated methods with using gradual forming mental actions that can result in not only increasing teaching effectiveness but also speedup of forming the ability to individually put a task and find the way to solve it with other words it provides to increase the quality of a specialist preparation [9].

The developed technology of formation of professional competence of students of specialty 5B011200-Chemistry based on use of interactive educational technologies is a set of methods and techniques that provide the most effective mastering of educational material in simulated conditions of professional activity. In this case interdisciplinary links and continuity in the continuous vocational training are provided during the whole period of study, and the content of interactive teaching is based on the principle of modularity which allows to build a logically completed and independent units in accordance with the set educational objectives, that finally allows to combine traditional methods of teaching and modern educational technologies, that provide high level of professional knowledge. At the same time the basic principles of didactics are followed, a comfortable psychological environment is created, and an individual approach to each student is provided.

On the forming stage of the experimental work two identical groups of students of specialty “5B011200-Chemistry” were formed on the basis of the International Kazakh-Turkish University by Ahmed Yasawi. The leading method of research was the pedagogical experiment on testing the conditions of formation of professional competence of the future teacher. The educational process in the experimental group was built in accordance with the hypothesis of our research. As an experimental variable in competence-oriented educational process of a high

school aimed at training future teachers of chemistry were introduced reasonable pedagogical conditions of forming of professional competence of a future teacher. The control group was engaged in conditions of traditional educational process.

According to methodological subjects students perform such pedagogical tasks that develop professional skills: to clarify the objectives and targets; to plan training activities; to analyze the results of training activities; to choose forms and methods study of the training material; to organize self-control and mutual control of students; to adjust the initial plan in the changing conditions [10].

In educational work were conducted interviews with experimental group students which successfully solve the problems in school that promotes comprehensive professional development of students. Using conversation teachers taught the students to compare, to contrast phenomena, processes, facts, to make conclusions, generalization, to highlight the most significant, to explain causes and results, to prove, to apply knowledge in different situations.

The level of formation of professional competence of the future teacher was assessed according to three criteria (cognitive, emotional-moral, operational-activity) in accordance with the chosen structure of the qualities and the logic of experimental work. The cognitive and emotional-moral qualities of future teachers of chemistry were examined by means of Kettall's 16-factor questionnaire and Dembo-Rubinstein's psychological tests in A. Ts. Puni's modification, and in order to assess the level of behavioral qualities and competences of future teachers of chemistry it was used the method of independent experts-leading teachers having the highest qualification category, as well as teachers and psychologists.

The results of the formative stage of experimental works showed that in experimental groups there is entire formation of professional competence of future teacher of chemistry who has a system of professionally significant qualities and competencies. In the control group creative abilities of the future teacher of chemistry are formed separately while in its development behavioral qualities overtake the cognitive and emotional-moral ones.

The efficiency of the revealed pedagogical conditions of formation of professional competence of a future teacher in the educational process is confirmed by the results of research of a professional self-assessment of future teachers of chemistry (tab. 1, figure 1) which show substantial increase of a share of students with an adequate self-assessment in the experimental group in comparison with the control one.

Table 1. The level of self-assessment of students belonging to both control and experimental groups before and after the pedagogical experiment (on the levels) %

Level	Control group		Experimental group	
	Before the experiment	After the experiment	Before the experiment	After the experiment
Overestimated	6,1	6,3	12,8	7,4
Adequate	37,2	38,1	36,6	76,3
Underestimated	56,7	55,6	50,6	16,3

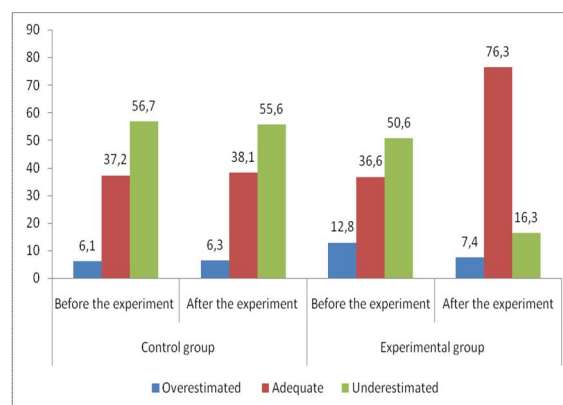


Figure 1. The level of self-assessment of students belonging to both control and experimental groups before and after the pedagogical experiment (on the levels) %

The results of integrated assessment of the level of formation of professional competence of future teachers by independent competent experts (table. 2, figure 2) also show a significant positive dynamics of formation of these characteristics of students in the experimental group as compared with the control one.

Table 2. The expert assessment of formation of professional competence of students of the both control and experimental groups before and after the pedagogical experiment (on the levels), %

Level	Control group		Experimental group	
	Before the experiment	After the experiment	Before the experiment	After the experiment
Low	34,1	27,2	32,6	8,7
Middle	51,7	58,6	47,3	36
High	14,2	14,2	20,1	55,3

The statistical processing of results of the research was carried out with the use of the following methods: calculation of coefficient of rank correlation on Spirmen; pair two-selective t-criterion of Student; the two-selective t-test with identical dispersions, χ^2 criterion. When researching professional self-assessment level of students χ^2 criterion was 14.58, and when assessing formation of creative abilities of future teachers by independent experts χ^2 criterion was 15.00. Both of these values show that the level of probability of an admissible mistake is less than 0,01.

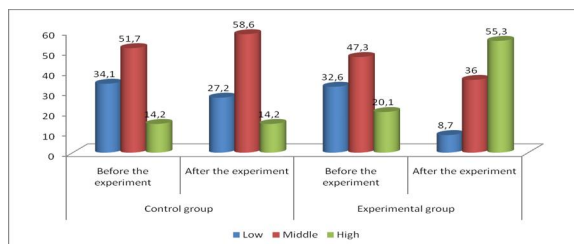


Figure 2. The expert assessment of formation of professional competence of students of the control and experimental groups before and after the pedagogical experiment (on the levels), %

Thus, we can make the following conclusions:

Thus, the results of experimental work proved efficiency and sufficiency of the pedagogical conditions of formation of professional competence of future teachers of chemistry in the educational process. Using the methods of mathematical statistics confirms the reliability and importance of the obtained experimental data. Thus synchronous development of all revealed personal qualities of future teachers of chemistry in experimentally simulated pedagogical conditions confirms the put forward by us theoretical clause on interconditionality of processes of formation of professional competence of a future teacher.

4. Conclusion:

Analysis of the results of the experimental work showed a considerable divergence on all the indexes and that proves the productivity of the developed system of preparation of higher education institution students; sensibleness of mastering professional technologies, necessity of their application in practice, ability to solve practical tasks applying interactive means, satisfaction with the results of preparation for professional activity.

Corresponding Author:

Dr. Niyazova, Ahmet Yasawi International Kazakh-Turkish University, B. Momyshuly Street, 65, 161 400, Kentau, Kazakhstan.
ngulzhan00@mail.ru

References

1. Programme of the Republic of Kazakhstan "State programme of education development in Kazakhstan for 2011 - 2020" of 7 December 2010 Astana, Akorda, Volume 1118.
2. Drujilov, S.A., 2005. Professionalnaya i kompetentnost professionalism pedagoga: psikhologicheskii podkhod. Sibir. Filosofiya. Obrazovaniya. Nauchno-publitsisticheskii

- almanakh SO RAO IPK.- Novokuznetsk, vypusk 8: 26.
3. Meyrbekova, G.P., T.A. Daniyarov, Z.E. Daribayev and K.M. Berkimbaev, 2013. Pedagogical value of using information technologies in the individual work of students. Bulletin of Peoples' Friendship University of Russia Series Informatization of education, 1: 66-76.
4. Berkimbaev, K.M. and B.T. Kerimbaeva, 2012. Communicative competence of future specialist. European Science and Technology. Materials of the 2th International Research and Practice Conference 9-10 May (issue Vol. 3), Wiesbaden Date Views 25.07.2013 sciencic.com/conference.
5. Uzakbaeva, S., B. Baimukhanbetov, K. Berkimbaev, B. Mukhamedzhanov and R. Praliev, 2013. To the Problem of Forming Creative Competence of Future Teachers. Creative Education, Vol.4(3). Date Views March 2013 www.scirp.org/journal/ce) DOI:10.4236/ce.2013.43034.
6. Kerimbaeva, B.T., 2012. To the problem of determining the essence of conception of communicative approach in professional training of future specialists. Fundamental research, 3. Date Views 25. 07. 2013 www.rae.ru.
7. Berkimbaev, K.M., S.T. Nyshanova, B.T. Kerimbaeva and G.P. Meyrbekova, 2012. The formation of professional competencies of future specialists New Educational Review. Poland: Thomson Reuters Journal Impact Factor 0.149, pp: 271-281.
8. Kerimbaeva, B.T., 2012. To the question of forming of informational-communicative competence of future specialists of electroenergetics. Bulletin of Peoples' Friendship University of Russia Series Informatization of education, 4: 81-88.
9. Berkimbaev, K.M. and B.T. Kerimbaeva, 2012. To the problem of using internet technologies in forming informational-communicative competence of future specialists/. Bulletin of laboratory of mathematical, education and informatization of the peer-reviewed collection of Scientifics., Volume 2: 22-31.
10. Berkimbaev, K., M. Akeshova, A. Meirbekov and G. Meirbekova, 2013. Correlation of the traditional approach and information-communicational technologies in training of the future ecologists in Kazakhstan. Life Science Journal, 10: 501-507 www.lifesciencesite.com.

8/2/2013