

On the basis of summarized results, the conclusion was reached: students of the experimental group significantly increased their readiness for educational work in the children's health and recreation camps. The reliability of the obtained results was verified using Student t-criterion (significance level  $p = 0.05$ ). It was established that the F-criterion ( $F_{emp}$ ) in the EG lies within the table value of  $F_{emp}$  whereas in the CG it is beyond the permissible limits. Consequently, the results confirm the reliability and not the chance of the results obtained. Thus, a steady increase in the level of readiness is the result of a specially organized experimental exercise on the introduction of pedagogical conditions and a model for training future teachers for educational activities in the children's health and recreation camps, which are sufficient to achieve their goals.

**Conclusions and results of the research.** In the course of the study the author determined that the professional activity of the teacher-organizer during the camp shift is an independent pedagogical activity with full responsibility for life, physical, psychological and moral health of children, their full rest and development, which involves the overall process of management and organization of activities of the teacher-organizer and children's group, aimed at the development, education, training and socialization of children. The teacher-organizer solves the educational tasks of social, ethical, moral and psychological nature. Educational work of the teacher-organizer includes: organizational and pedagogical work; studying the age and individual peculiarities manifestation specificity of children, their health, living conditions; organization of group and creative activity in all areas of education (cognitive interests of children, moral, aesthetic, labor education, sports and recreation work); regime organization, active recreation of children, sanitary and hygienic work and self-service; individual educational work with children. The peculiarities of pedagogical activity in children's health and recreation camps include: the presence of temporary groups of children with mixed age with different social experiences of children, which implies separation from family and parental care; adherence to the principles of voluntary participation of children in various matters, and free choice of them; clear planning of camp shift; involvement in the educational process of both professional teachers and students-practitioners; the pedagogical process is carried out under favorable conditions of the natural and social environment; direct compliance by the children of the regime of the day, fulfillment of sanitary and hygienic requirements; a combination of education with recreation which contributes to the formation of self-care skills, self-preservation, prevention of injuries. The content of educational work in the children's health and recreation camps is determined by the main areas of activity (health, communication, education, leisure, family) and depends on the organizational, main and final periods.

*Perspective directions* for further researches are identified: the problem needs the development in the study of historical experience in the organization of educational activities and preparation for it, as well as the introduction of advanced European experience in the educational process of training of future teachers-organizers.

### **Bibliography**

1. Волохов, А. В. (1999). *Теория и методика социализации ребенка в детских общественных организациях*. (Дис. д-ра пед. наук). Ярославский государственный педагогический университет, Ярославль.
2. Коваль, М. Б. (1991). *Становление и развитие системы воспитательной деятельности внешкольных объединений*. (Дис. д-ра пед. наук). Москва.
3. Тарасова, Т. В. (Ред.). (1997). *Особливості організації і проведення літнього відпочинку школярів*. Тернопіль.
4. Олійник, Н. Я. (2013). *Підготовка майбутніх учителів до виховної роботи в дитячих оздоровчих таборах*. (Дис. канд. пед. наук). Тернопіль.
5. Яковець Н. І. (Ред.). (2005). *Сонячне літо в таборі*. Ніжин: Вид-во НДУ імені М. Гоголя.
6. Соля, М. М., Луцький Я. В. (1995). *Виховна робота в дитячих оздоровчій закладах*. Івано-Франківськ.

### **Bibliography**

1. Volokhov, A. V. (1999). *Theory and methods of child socialization in children's public organizations*. Doctor's thesis. Yaroslavl, Russia
2. Koval, M. B. (1991). *Formation and development of the system of educational activities of out-of-school associations*. Doctor's thesis. Moscow, Russia
3. Tarasova, T. V. (Ed.). (1997). *Methodical recommendations «Peculiarities of organization and holding of summer rest of schoolchildren»*. Ternopil, Ukraina
4. Oliinyk, N. Ya. (2013). *Training of future teachers for educational work in children's health and recreation camps*. PhD thesis. Ternopil, Ukraina
5. Yakovets, N. I. (Ed.). (2005). *Sunny summer in the camp: Educational manual*. Solova, V. M., Opanasenko, H. Yu., & Yakovets, N. I. (Compilers). Nizhyn: Publishing house of the NSU by M. Hohol, Ukraina
6. Soia, M. M., & Lutskyi, Ya. V. (1995). *Educational work in children's health and recreation establishments*. Ivano-Frankivsk, Ukraina

## **2.12. FORMATION OF THE SKILLS OF CONDUCTING A CHEMICAL EXPERIMENT IN SCHOOL BY FUTURE TEACHERS OF NATURAL SCIENCES**

UDC 378.14

**Anichkina O.V, Figol N. A.**

**Annotation.** *The theoretical analysis of the problem of forming the skills of conducting an educational chemical experiment by future teachers of natural sciences in the pedagogical theory and practice, resulted in the need to create a unified, interdisciplinary, practical, methodical model for the formation of experimental skills in conducting a chemical experiment. The model of such a process is developed, the basic concepts, skills of carrying out of the modern chemical experiment are specified. General (intellectual), experimental (the ability to perform an educational chemical experiment in all its types) and methodical (the ability to*

*explain the methodology of carrying out an educational chemical experiment to students) skills are defined. The components of the formation of the ability to conduct an educational chemical experiment defined: motivation, knowledge, activity.*

*Key words: future teachers of natural sciences, experiment, chemical experiment, types of experiment, pedagogical conditions, methodical model.*

*Actuality of theme.* Improvement of professional and pedagogical preparation of students is one of the problems of the methodology of teaching chemistry in the conditions of modernization of education. The ongoing reform of the content of future teachers' education requires identifying the main components of their training as highly skilled pedagogical staff, developing and implementing a methodology for developing their respective knowledge, skills and abilities. Taking into account the competence approach in the training of teachers in institutions of higher education, the competencies that students need to acquire in order to obtain a teacher's qualification are identified. The general competencies (generic competences, transferable skills) of teachers are reviewed in scientific sources in detail, but the subject-specific competences of the teacher of chemistry competence have not yet been studied. The problem of carrying out a chemical experiment during the training sessions has been given much attention in the writings of methodologists Astakhov O. [1], Verkhovsky V. [4], Vivirsky V. [5], Grabektsky O. [6], Kiryushkin D. [7], Polosina V. [8], Tsvetkov L. [9], Shatalov M. [11], and others. The study of the classification, content, methods of organization and methods for including the chemical experiment into a lesson was carried out by prominent Ukrainian educators Burinskaya N. [2], Velichko L. [3], Chaychenko N. [10], Yaroshenko O. [12] and others. *The purpose* of the article is to identify the factors influencing the effectiveness of forming the skills of conducting a chemical experiment by students.

*The main content of the article.* In the methodological literature the main reasons for the inadequate use of the experiment in the educational process are: poor motivation and lack of desire of young teachers to use chemical experiment as a leading teaching method; insufficient level of chemical and professional-pedagogical knowledge; insufficient formation of their abilities to perform an educational chemical experiment; absence of a system of skills (general (intellectual), experimental, methodical) to conduct an educational chemical experiment based on its didactic purpose, age characteristics of students and their level of training; inconsistency of the modern material base in institutions of higher education. The formation of skills to conduct an educational chemical experiment serves the purpose, means and result of preparing future teachers for professional activities, it is the key to the formation of experimental and methodical skills [7].

The generalization of existing classifications of educational chemical experiment has allowed to allocate its types in the form of organization: demonstrational, laboratory and intellectual; types, depending on the possibilities of using in the educational process: the teacher (real, multimedia), the student (illustrating his own answer, helping the teacher), practical (laboratory experiments, practical work), extra-curricular (home, circular), theoretical, practical, virtual; forms,

depending on the degree of independence of mental activities of students: illustrative, research. Formation of the ability to conduct an educational chemical experiment is carried out to a greater extent on the training sessions in the discipline "Methodology of teaching chemistry" [6, 9].

In the course of the study the pedagogical conditions for the formation of the skills of carrying out an educational chemical experiment by future teachers of natural sciences were revealed: introduction of interdisciplinary connections in the formation of the skills of conducting a school educational chemical experiment by future teachers during studying in higher education institutions; introduction of the principle of gradual formation of the skills of conducting a demonstration school educational chemical experiment in the study process during the study of disciplines of methodological training in higher education institutions; use of possibilities of educational lessons from methodical disciplines to form the initial professional experience of future teachers to conduct a school educational chemical experiment; improvement of various methodological forms, means and methods for providing the formation of the skills of future teachers to conduct a variety of school educational chemical experiments [10, 12].

After analyzing the curricula of the basic chemical disciplines, we determined that using the preliminary interdisciplinary link implementation line, it is possible to use school educational chemical experiments in the workshops of chemical disciplines. All school chemical experiments proposed for a general education institution program can be performed by students at laboratory classes. In this case, the practical training on chemical disciplines does not lose didactic content, and the professional orientation of training increases significantly [5]. The sequence of studying the subjects in higher education institutions and the implementation of the stages of formation of the skills of conducting an educational chemical experiment by future teachers gave the opportunity to master the skills fully and thoroughly, allowed the gradual, continuous acquisition of future teachers by the basic skills of future professional activities and ensured the formation and improvement of skills during studying in institutions higher education.

The repeated execution of various demonstrations in the process of studying methodological disciplines ensures that each student acquires elementary professional experience in carrying out a demonstration chemical experiment, using self-examination and inter-analysis to determine the formation of skills for doing it, enhancing motivation to use the experiment in their own educational and professional activities. On the other hand, the multiple execution of the experiment gives the opportunity to change its methodical component: to complicate the experiment depending on age characteristics of students, level of training, interest in the study of chemistry, material base of the cabinet, etc. [2, 5]. We selected forms (lecture, laboratory lesson, individual class), methods (verbal, visual, practical) and means (real and multimedia teaching experiment, virtual chemical laboratory, reference summary of knowledge, printed matter basis of workbooks, task-drawings, micro-examination, problem pedagogical situations, business games, an individual creative task-lesson, the creation of a home laboratory), through which the ability to conduct an educational chemical experiment by future teachers of natural sciences is formed.

The possibilities of using a definite pedagogical toolkit in the educational process of higher educational institutions are described in detail.

The proposed process of formation of the ability of the future natural sciences teachers to conduct an educational chemical experiment has allowed to maximize the use of the possibilities of methodological educational disciplines, forms, methods and means of training for students to acquire the initial professional experience of future professional activity. The result of the system-structural analysis of the process of forming the skills to conduct an educational chemical experiment was a methodical model, which includes a system of interconnected blocks: motivational-value, content, organizational-procedural, productive-corrective [10]. According to the content of the mastery of the skills to conduct an educational chemical experiment we defined the organizational stages (accumulation, developmental, final, refinement), depending on the terms of students' training in higher education institutions, and stages of formation of such skills in the process of studying the subjects of professional and practical training (motivational, orientational, material, commentary, demonstration, improving) during the stages of the theory of phased formation of mental actions.

Assessment of the level of formation of future natural sciences teachers in the ability to conduct an educational chemical experiment took place in different ways: mutual control (assessment of the formation of skills by other students during modeling of demonstrations, laboratory experiments, practical work), control by the teacher (at each stage of skill development) and self-control (at home). Triple evaluation provided effective monitoring, the ability to adjust the levels of formation of students' abilities to conduct an educational chemical experiment and the formation of their ability to use different methods of evaluation with a diagnosis in future professional activities. The system of formation of skills to conduct an educational chemical experiment is represented by interrelated aims, content, forms, methods and means of learning, as well as the theoretical and practical activities of students during classroom and non-auditing studies at a higher educational institution and in the process of practice in a general educational institution at all stages formation. The dynamism of the system is determined by constant updating of the content, improvement and modernization of the forms, methods and means of forming the skills of conducting an educational chemical experiment [3].

At the *ascertainable stage* of the study the results were obtained, which showed that the students achieved the average level of formation of skills to conduct a chemical experiment according to the traditional method, which is fully confirmed by the results of the observation of the activities and questionnaires of young teachers (experience up to 5 years).

At the *formative stage* of the study, according to its content and tasks, experimental learning was implemented by introducing a developed methodology for forming the skills of carrying out an educational chemical experiment by future teachers of natural sciences in the forms, methods and means determined by the model. The effectiveness of the developed methodical model for forming the skills of conducting a chemical experiment by future teachers of natural sciences was carried out in the course of a longitudinal experiment (four points of control). Student's

criterion (parametric homogeneity criterion) was used to ensure the integrity of the match and the difference in experimental data.

Calculated average values of the coefficient of formation of skills allowed to determine the levels that students gained during the training (Table 1).

Table 1

**Average values of the coefficient of formation of the skills of conducting a training chemical experiment, which were acquired by students of control and experimental groups**

Criteria	Skill	Experimental group		Control group	
		K form.	P form.	K form.	P form.
Motivational		0,526	0,225	0,418	0,121
Knowledge	General	0,569	0,222	0,462	0,106
	Experimental	0,667	0,256	0,532	0,148
	Methodical	0,608	0,279	0,457	0,107
	Average	0,614	0,252	0,481	0,12
Activity	General	0,51	0,117	0,409	0,051
	Experimental	0,624	0,27	0,476	0,129
	Methodical	0,594	0,192	0,408	0,052
	Average	0,583	0,193	0,431	0,077

Experimental training allowed the students of experimental (EG) and control (CG) groups to reach the average level of formation of the skills of conducting an educational chemical experiment based on a motivational criterion. The average value of the coefficient of formation of skills according to knowledge and activity criteria indicates the achievement by students of the experimental group of sufficient level, and students of the control group only the average level of formation of the appropriate skills. According to the results of experiment, we established that the number of students with high level of formation of skills reached: for the motivational criterion in EG - 20,36%, CG - 13,72%; for the knowledge criterion (general (intellectual) skills: in EG - 16,29%, CG - 8,85%; experimental skills: in EG - 27,15%, CG - 11,95%; methodical skills: in EG - 23,53%, CG - 6,64%), according to the activity criterion (general (intellectual) skills: in EG - 9,05%, CG - 4,87%; experimental skills: in EG - 29,86%, CG - 11,95%, methodical skills: in EG - 21,27%, CG - 5,75%.

The calculation of the average of the coefficient of completeness of the implementation of actions (abilities) made it possible to determine that the developed skills are performed by the students of the experimental group on sufficient (general (intellectual)) and high level (experimental and methodical), whereas in the control group students — on average (general intellectual) and sufficient (experimental and methodological). The reliability of the results obtained is verified by checking the experimental and control groups on the basis of homogeneity using Student's criterion in the learning dynamics.

*General conclusion.* According to the results of the study, the proposed pedagogical conditions and methodical model ensure the formation of practical skills in conducting a chemical experiment. The conducted research does not cover all aspects of forming the skills of carrying out an educational chemical experiment by

future teachers of natural sciences. *Further scientific search* is necessary to determine the possibility of improving the formation of general (intellectual) skills to conduct an educational chemical experiment; creation of a virtual methodological laboratory for use in the educational process.

#### **Bibliography**

1. Астахов О. И. Астахов О. И. (1965) *Методика і техніка хімічного експерименту* : [посіб. для вчителів] — К. : Рад. школа. - 205 с
2. Буринська Н. М., Буринська Н. М. (2015). *Хімія* : підруч. [для 7 класу загальноосвіт. навч. закл.] - К. : Педагогічна думка. - 112 с
3. Величко Л. П., Величко Л. (2006). Віртуальна хімічна лабораторія — один із засобів формування освітніх компетентностей учнів/ Проблеми якості природничої педагогічної освіти : зб. наук. праць за матеріал. міжнар. наук.-практ. конф. 25-26 травня 2006 р. — Полтава, — С. 22—24.
4. Вивюрский В. Я. (2003). *Методика химического эксперимента в средней школе: метод, пособ. для преподавателей химии* [Электронный ресурс] / *Химия*-№ 40. - Режим доступа : <https://him.lseptember.ru/2003/40/1.htm>
5. Вівюрський В. Я. (2004) *Методика химического эксперимента в средней школе ; метод, пособ. для преподавателей химии* [Электронный ресурс] / *Химия*. — № 5. — Режим доступа : <https://him.lseptember.ru/2004/05/6.htm>
6. Грабецкий О. А. Грабецкий А. А. (1983). *Кабинет химии* : [пособ. для учителей] — М.: Просвещение - 176 с.
7. Кірюшкін Д. М., Кірюшкін Д. М. (1974). *Методика навчання хімії* - К. : Вища школа. — 416 с
8. Полосин В. С. Полосин В. С. (1997). Чтобы не ошибиться при выборе эксперимента / *Химия в школе*. - №5. - С. 60-62.
9. Цветков Л. А. Цветков Л. А. (1973). *Эксперимент по органической химии в средней школе. Методика и техника* : [пособ. для учителя] — [5-е изд., дополн.] - М. : Просвещение - 286 с.
10. Чайченко Н. Н. (2006). Використання проблемного експерименту в хімічній підготовці учнів / *Хімічна освіта в контексті Болонського процесу* : стан і перспективи : матеріали всеукр. наук.-практ. конф. 18-19 травня 2006 р. / за заг. ред. В. П. Покася, В. С. Толмачової. - К. : НПУ імені М. П. Драгоманова - С. 162-164.
11. Шаталов М. А. (2004). Система методической подготовки учителя химии на основе проблемно-интегративного подхода: автореф. дисс. на соискание учен. степени докт. пед. наук : спец. 13.00.02 «Теория и методика обучения и воспитания (химия)» / М. А. Шаталов. — СПб/ — 40 с.
12. Ярошенко О. Г. Ярошенко О. Г. (2011) / Підвищення ефективності навчання хімічним дисциплінам у вищій школі засобами інформаційних технологій / О. Г. Ярошенко, Т. М. Деркач // *Проблеми сучасної педагогічної освіти*. Серія : Педагогіка та психологія : [зб. статей]. - Ялта, РВВ КГУ — С. 138-144.

#### **Bibliography**

1. Astakhov, O., Nikolaev G. N. (1965). *Method and Technique of Chemical Experiment*. Kiev: Rad. school.
2. Burinska, N. M. (2015). *Chemistry*. Kiev: Pedagogical thought.
3. Velichko, L., Lashevskaya A. (2006). Virtual Chemical Laboratory - One of the Tools for the Formation of Educational Competences of Students. *Problems of the Quality of Natural Pedagogical Education: Materials International Scientific and Practical Conference*. Poltava, May 25-26, 2006. (pp. 22-24).
4. Vivyursky, V. (2003). Method of Chemical Experiment in High School. *Chemistry*, 40, Retrieved from <https://him.lseptember.ru/2003/40/11.html>
5. Vivyursky, V. (2004). Method of Chemical Experiment in High School. *Chemistry*, 5, Retrieved from <https://him.lseptember.ru/2004/05/6.htm>.
6. Grabetsky, A., Nazarov T. S. (1983). *The Cabinet of Chemistry*. Moscow Enlightenment.
7. Kiryushkin, D. M., Polosin V. S. (1974). *Methodology of Chemistry Studies*. Kiev: Higher school.
8. Polosin, V. S., Korshunova N. V. (1997). Not to Be Mistaken When Choosing an Experiment. *Chemistry in school*, 5, 60-62.
9. Tsvetkov, L. (1973). Experiment on Organic Chemistry in High School. *Methodology and Technique*. Moscow: Enlightenment.
10. Chaychenko, N. (2006). The Use of Problem Experiment in the Chemical Preparation of Students. *Chemical education in the context of the Bologna process: the state and prospects: Materials of All-Ukrainian scientific and practical conferences*. Kiev, May 18-19, 2006. (pp. 162-164). Kiev: NP Drahomanov NPU.
11. Shatalov, M. (2004). *System of Methodical Preparation of the Teacher of Chemistry on the Basis of Problem-integrative Approach*. (Author's Abstract, diss to acquire a scholar, degree doc. ped Sciences). St. Petersburg [in Russian].
12. Yaroshenko, O. G., Derkach T. M. (2011). Increasing the Efficiency of Teaching Chemical Disciplines in Higher Education by Means of Information Technologies. *Problems of modern pedagogical education. Pedagogy and Psychology*. Yalta: RVB KSU, 138-144.

### **2.13. FORMATION OF PROFESSIONAL COMPETENCE TO TRAINING FOR MUCH ARTS OF FUTURE TEACHERS OF PHYSICAL EDUCATION**

UDC 378.016 : 796.85

**Rybalko L. S., Korobeynik V. A., Ivanov D. S.**

**Abstract.** The article focuses on the inadequate formation of professional competence of future teachers of physical education in the training of martial arts. It is noted that professional competence in the study of martial arts of future teachers of physical education is an integral part of his professionalism, the ability of the individual to disclose and use the educational potential of martial arts to teach students the ability to self-defense. The teacher of physical education, with his example, should raise the interest of schoolchildren in physical education. The