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WAYS TO DEVELOP THE RESEARCH COMPETENCE OF FUTURE CHEMISTRY TEACHERS IN THE CONTEXT OF DIGITAL EDUCATION

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Abstract. In the digitalization of education, the need to develop comprehensive strategies capable of integrating technological innovations with the fundamental principles of pedagogical science is urgent. Research activities not only adapt to current technological changes, but also create new educational models in which teachers develop advanced strategies for their professional development. The article discusses ways to develop the need to develop the research competence of a future chemistry teacher, based on the fundamental principles of pedagogical science in the context of digital education. The purpose of the research is to identify the features of ways to develop the research competence of future chemistry teachers in digital education. In the course of achieving this goal, based on scientific works, the level of formation of research competencies of students in the field of chemistry teacher training was determined. In the process of teaching chemistry, the experience of students' self-development and the use of modern methods of creative search were analyzed. A methodological system for organizing the research activities of future chemistry teachers in the context of digital education has been developed. In order to determine the effectiveness

of the methodological system, students of the educational program 6B01512-Chemistry conducted a pedagogical experiment on the subjects "Methods of conducting chemical experiments at school", "Methods of making visual aids". During the experiment, not only the indicators of the students' level of knowledge acquisition were taken into account, but also qualitative indicators that can serve as a basis for the development of research competencies. They were determined by the level of activity and development of cognitive and personal components. The results obtained during the study show that the use of digital technologies in the development of research competencies of future chemistry teachers can make innovative changes in the educational space of the university.

Keywords: future chemistry teacher, research competence, digitalization, methodological system, pedagogical experiment

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ЦИФРЛЫҚ БІЛІМ БЕРУ ЖАҒДАЙЫНДА БОЛАШАҚ ХИМИЯ МҰҒАЛІМДЕРІНІҢ ЗЕРТТЕУШІЛІК ҚҰЗЫРЕТТІЛІГІН ДАМУ ЖОЛДАРЫ

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Аннотация. Білім беруді цифрландыруда педагогика ғылымының іргелі принциптерімен технологиялық инновацияларды интеграциялауға қабілетті кешенді стратегияларды әзірлеу қажеттілігі өзекті болып табылады. Ағымдағы технологиялық өзгерістерге бейімделіп қана қоймай, мұғалімдер өзінің кәсіби дамуының озық стратегияларын жобалайтын жаңа білім беру модельдерін құруда ғылыми зерттеу қызметі маңызды болып табылады. Мақалада цифрлық білім беру жағдайында педагогикалық ғылымның іргелі принциптеріне сүйене отырып, болашақ химия мұғалімінің зерттеушілік құзыреттілігін дамыту қажеттілігін дамыту жолдары қарастырылады. Зерттеу жұмысының мақсаты: цифрлық білім беру жағдайында болашақ химия мұғалімдерінің зерттеушілік құзыреттілігін дамыту жолдарының ерекшеліктерін анықтау. Осы мақсатқа жету барысында ғылыми еңбектерге сүйене отырып, химия мұғалімдерін даярлау бағытындағы білім алушылардың зерттеушілік құзыреттіліктерінің қалыптасу деңгейі айқындалды. Химияны оқыту үдерісінде білім алушылардың өзін-өзі дамыту, шығармашылық ізденістің заманауи тәсілдерін қолдану тәжірибесі сараланды. Цифрлық білім беру жағдайында болашақ химия мұғалімдердің зерттеушілік қызметін ұйымдастырудың әдістемелік жүйесі құрастырылды. Әдістемелік жүйенің тиімділігін анықтау мақсатында 6B01512-Химия білім беру бағдарламасының білім алушыларына «Мектепте химиялық эксперимент жүргізу әдістемесі», «Көрнекі құралдар дайындау әдістемесі» пәндері бойынша педагогикалық эксперимент жүргізілді. Эксперимент барысында білім алушылардағы білімді меңгеру деңгейінің көрсеткішін ғана өлшеумен шектелмей, зерттеушілік құзыреттілікті дамытуға негіз бола алатын сапалық көрсеткіштер де ескерілді. Ол сапалық көрсеткіштер белсенділік және когнитивтік, тұлғалық құраушылардың дамуы деңгейімен айқындалды. Зерттеу барысында алынған нәтижелер болашақ химия мұғалімдерінің зерттеушілік құзыреттілігін дамытуда цифрлық технологияларды қолдану университеттің білім беру кеңістігіне жаңашыл өзгерістер әкеле алады.

Түйін сөздер: болашақ химия мұғалімі, зерттеушілік құзыреттілік, цифрландыру, әдістемелік жүйе, педагогикалық эксперимент

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ПУТИ РАЗВИТИЯ ИССЛЕДОВАТЕЛЬСКИХ КОМПЕТЕНЦИЙ БУДУЩИХ УЧИТЕЛЕЙ ХИМИИ В УСЛОВИЯХ ЦИФРОВОГО ОБРАЗОВАНИЯ

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Аннотация. В условиях цифровизации образования особую актуальность приобретает разработка комплексных стратегий, обеспечивающих интеграцию технологических инноваций с фундаментальными принципами педагогической науки. Научно-исследовательская деятельность в современных условиях не только адаптируется к происходящим технологическим изменениям, но и способствует формированию новых образовательных моделей и расширению возможностей профессионального развития будущих педагогов. В статье рассматриваются пути развития исследовательских компетенций будущих учителей химии в условиях цифрового образования. Цель исследования — определить и обосновать эффективные пути развития исследовательских компетенций будущих учителей химии посредством применения цифровых образовательных технологий. Для достижения поставленной цели на основе анализа научной литературы был определен исходный уровень сформированности исследовательских компетенций студентов, обучающихся по направлению подготовки учителей химии. В процессе обучения проанализирован опыт саморазвития студентов и применения ими современных методов творческого и исследовательского поиска. Разработана методическая система организации исследовательской деятельности будущих учителей химии в условиях цифрового образования. Для определения эффективности предложенной методической системы со студентами образовательной программы «6В01512 — Химия» был проведен педагогический эксперимент в рамках дисциплин «Методика проведения химического эксперимента в школе» и «Методика изготовления наглядных пособий». В ходе эксперимента оценивались не только показатели уровня

усвоения знаний, но и качественные изменения, связанные с развитием исследовательских компетенций студентов. Особое внимание уделялось уровню познавательной активности, самостоятельности и личностной вовлеченности обучающихся в исследовательскую деятельность. Полученные результаты показывают, что применение цифровых технологий в процессе формирования исследовательских компетенций будущих учителей химии способствует качественному обновлению образовательного процесса и расширяет возможности организации их самостоятельной научно-исследовательской деятельности.

Ключевые слова: будущий учитель химии; исследовательские компетенции; цифровизация образования; методическая система; педагогический эксперимент; цифровые технологии

Introduction. In order for our country to fit into the world education system, the educational paradigm has changed and a new national model has been formed. In accordance with this, in the future, it requires improving the quality of training of teachers who train and educate a person who thinks in a new way, is prone to social changes and has a developed consciousness, an established attitude. The task of a teacher in modern society is to form a competent and competitive person who is flexible enough to live in an age of rapid development of science and technology, working for the benefit of society, prone to creativity, competent and competitive. That is, the role of future teachers in improving the quality of modern education is special.

Since the main mechanism for improving the quality of education is the teacher, a deep qualification of the teacher is necessary. In the implementation of these tasks, the «Concept for the development of higher education and science of the Republic of Kazakhstan for 2023-2029» aims to develop the education of the younger generation by improving the continuing education of teaching staff. The development of intellectual abilities of students in high school is one of the tasks performed by teachers of each subject. Subject teachers need to find effective methods and lead them to creativity in order to form students with a comprehensive, deep knowledge, a high level of intellectual abilities. If this is the case, then it is important to develop a future chemistry teacher's research competence.

Literature review. Intensive digitalization of society requires rethinking approaches to professional training of teachers. That is, it shows the need to present new approaches to education. This process is based on key changes in the education system, that is, the modern digital educational space. The modern digital transformation of education systems has led to changes in the professional training system. Under the influence of a complex of global technological and socio-cultural challenges, the traditional system of professional training is carried out through a radical transformation. The intensity of technological changes, accordingly, adds new requirements to the professional competencies of teachers, leading to changes in existing educational methodologies.

The gap between the pace of technology development and the speed of updating educational strategies is becoming the main methodological problem. Scientists such as T. N. Noskova, T. B. Pavlova and O. V. Yakovleva showed in their research (Novik, 2012) that traditional methods of professional learning are not able to quickly adapt to the rapid changes in digital reality, emphasizing the technical aspects of digital technologies.

We can also see the global nature of the contradictions identified in international research by differentiating the works of scientists. Li Tian, in his work, considered that the presence of technical skills in the digitalization of pedagogical knowledge in China does not guarantee the effective pedagogical integration of digital tools. And the works of M. Prensky clearly show the heterogeneity of pedagogical personnel, which exacerbates the problems of their professional training in the context of digital transformation (Minnahmetova, 2022).

It is necessary to develop new educational models that not only adapt to current technological changes, but also design advanced strategies for the professional development of Teachers. The researcher described the need to develop complexes capable of combining innovations with the fundamental principles of pedagogical science. The socio-pedagogical context of the transformation of educational practices is determined by a complex of external factors.

It is important to analyze the requirements for the professional training of teachers and the organization of research activities in terms of determining the role of research activities of students and establishing the correspondence between the competencies formed at the undergraduate level.

In this context, the Professional standard «Teacher» defines the requirements for the level of qualification, competence, content, quality and working conditions of teachers at all levels of Education. In the course of the analysis of this document, the teacher was obliged to perform the following Labor functions (<https://adilet.zan.kz/kaz/docs/V2200031149>):

- implementation of the educational process;
- assessment of students' academic achievements;
- support of public confidence in the profession and involvement of students in the value system;
- implementation of educational and methodological activities.

For the implementation of Labor functions, in particular, general pedagogical ones, teachers need to have skills in organizing Cognitive Research, Educational Research and independent research, as well as the ability to organize research (experiment, finding patterns, etc.). Consequently, in the process of professional training of teachers, significant attention should be paid to the formation of their research competencies. At the same time, it is important to teach future teachers to do research work in training. Students should be able to meet the requirements of the organization of research work in their future professional activities:

- actual problems, development trends, methods (technologies) of the relevant scientific field and (or) field of professional activity;

- methodology of scientific research in the relevant field of knowledge;
- theoretical foundations and technologies of research and design activities, requirements for the design of design and research works, etc.;
- participation in the organization of research, design and other activities of students;
- provide methodological assistance to students in choosing and designing a topic, conducting the main stages of research work;
- review of project and research works of students;
- analysis of scientific and educational materials, assessment of their quality, etc.

The author of the classical textbook V. I. Zagvyazinsky and other researchers write about the need to improve the research activities of teachers (Lyzhin, Konovalov, 2021). L.G.Khisamieva identifies four components of the research activity of the teacher (Khisamieva, 2014):

- cognitive (putting a research problem);
- abductive (assumption-formulation of hypotheses);
- argumentation (search for evidence or evidence to defend the situation put forward, implementation of research methods);
- verification (evaluation of results).

In addition, on the basis of the problems of the teaching profession in the 21st century, the OECD noted the importance of scientific research work for teachers (Guerriero, 2017). Teachers need research competence to read and interpret the results of the relevant research, and to carry out further research work. Then there is a need for a modern teacher to develop research competence in fulfilling the tasks set for modern education. Therefore, the concept of «competence» is often used today. Competence is the individual ability of the teacher, his qualification (knowledge and experience), the ability to independently make decisions. Competence - the readiness and ability of an individual to perform certain tasks with theoretical knowledge and practical experience. It is manifested not in the form of inanimate memorized knowledge, but in the activity of the individual's flexibility to participate in cognition, thinking and action, to propose certain problems, to make solutions, to analyze its course and results, to constantly make rational adjustments. Competence puts in the first place not the information literacy of a person, but his ability to correctly solve a problem. In his research, A. Khutorskoy called the concept of competence a social requirement, which is given in advance to the acquisition of knowledge necessary for the effective activity of a student in a particular area, and A. K. Markova proposed a similar self-definition. Research competence as an integrative characteristic of a person - involves mastering the methodology and technology of research activities, recognizing their value and readiness for use in professional activities (Khutorskoy, 2021).

This competence is of decisive importance in various areas of their professional knowledge. For example, teachers rely on this knowledge to effectively plan their learning processes based on the latest research. In addition, competence in research

is the basis for the sustainable professional development of teachers and allows them to evaluate innovations in their schools, manage development processes. This is reflected in the increasing number of methodological works based on the development of the school, in which teachers collect, analyze and interpret data to justify their decisions (Drahmann, 2018).

Research competence is understood as the Integrative and dynamic properties of the personality. It is formed in the educational process of students and during independent research activities. It, in turn, is expressed in the readiness and ability to carry out research activities on the basis of the formed set of knowledge necessary and sufficient special skills for the quality performance of research or research work, research skills and experience, characteristic of each level of Higher School Education and/or job responsibilities of a researcher at each stage of career development.

However, the concepts of research competence of future teachers are different and often inaccurate. In accordance with the general concepts of teacher competence, research competence is interpreted as a complex structure that includes certain cognitive and affective-motivational characteristics to meet research requirements.

Most scientists on the components of competence distinguish between cognitive and activity components of competence, in addition to these, there are also motivational-personal, value-semantic and emotional-volitional components. In our opinion, for the correct formation of any competence, cognitive, activity and personal components are necessary. The cognitive component includes the necessary knowledge in a particular type of activity, the activity component includes skills and successful experience in performing activities, and the personality component includes self-ability. If we consider the content of these components in the formation of research competence, Z. N. Apazova defines research competence as «the ability to characterize the process and result of the activity of creative thinking, research design activity» (Apazova, 2009). A.V. Khutorskoy in his research considers the elements of methodological, subject, logical activity of research competence as components of cognitive competence, goal setting, planning, analysis, as ways of organizing reflection. In addition, it is noted that intellectual and spiritual self-development serves as an integral part of the competence of personal self-improvement.

In particular, these requirements involve the use of knowledge about scientific methods in their professional field, critical thinking on them and use for their own pedagogical practice. In addition to these specific competencies, school teachers need interdisciplinary abilities such as critical thinking, problem solving, and self-management to successfully conduct research.

One of the methods for developing the research competence of teachers is RBL (Research based learning). In higher education, the RBL method refers to specific learning processes in which students are encouraged by actively and independently conducting a research project in order to promote professionalization.

In its study, Borg found that the RBL method is essential in the most important

cognitive component of the research competence of future teachers. The RBL method equally includes knowledge and skills that fall under the basis of interaction with research (i.e. learning and use), as well as participation in research (conducting and organizing) (Borg, 2010). In the Cammann study, the RBL method works with measurements that reflect the typical stages of the search process in the course (Cammann et al. 2020):

- research problem (including the transformation of a practical problem into a research problem);
- research design;
- data collection;
- data analysis;
- interpretation and use of data.

Each of the five dimensions is defined by three dimensions that describe the knowledge and skills that teachers need to meet the requirements of each stage of the research process. The RBL method can serve as the basis for students to actively participate in the research process and form their own ideas.

Therefore, being a potential teacher at this time was considered a mandatory requirement. They include pedagogical skills and the ability to develop students' knowledge, creativity and ways to solve problems. To ensure high-quality teaching of students, teachers need to constantly develop and develop research competencies.

We take as a basis the position of researchers L. Sh.Abdulova (Feskova, 2005) and A. N. Dahin (Nýrieva, 2012), the research competence of the teacher:

- tendency to change;
- the ability to quickly and quickly attach importance to freelance situations;
- to see and identify the problem, find ways to solve it, evaluate the results;
- to observe, analyze pedagogical phenomena and facts, to propose and solve professional pedagogical tasks on their basis, to make forecasts;
- identify important points, set priorities, plan, develop and conduct an experiment;
- to process and summarize the results of the experiment;
- design of scientific work in the form of a report-abstract, report, scientific article;
- to work with original sources;
- use the achievements of the relationship of pedagogy with other sciences.

Thus, by differentiating scientific works, research competence is understood as a characteristic of a person who can have research skills at the technological level in order to search for knowledge that can solve learning problems, conduct the educational process. However, the human being is a researcher by birth, but the research capacity given to man by birth is insufficient. Students should master the theory of research and the essence of practice. It actualizes the problems of the formation of research skills and abilities of the growing generation. After all, without these abilities, it is impossible to form research competence. In

connection with modern world changes, in the process of digitalization, a teacher who knows how to work with professionally significant competencies, as well as research competencies, is in demand. It is known that in the implementation of strategic tasks of education, measures have long been needed to develop the research competence of teachers through digitalization. Through the use of digital technologies, each teacher can develop their own research competence.

Since the subject of chemistry is an experimental subject, the methods used in the study of chemistry (experiment, synthesis, hypothesis development, etc.) coincide with the main components of research competence. And it is directly related to the process of developing research competence in teaching chemistry. Therefore, the main task of a chemistry teacher is to form students' own research competence when teaching chemistry. The research competence of the future chemistry teacher is formed in the process of educational and research activities, a necessary condition for the personal and professional development of students. It is expressed through the organization of research activities and special skills. In turn, it is expressed in the presence of knowledge about the acquisition of skills. If so, it is reflected in the enrichment of research activities and the subjective experience of the individual. Ensures the ability of the future teacher to continuous self-education and search, his readiness for active, creative, professional activity (Faritov, 2016).

The purpose of this article was to identify the features of the ways of developing the research competence of future chemistry teachers in the context of digitalization of Education.

Research objectives:

- determination of the level of formation of research competencies of students in the direction of training chemistry teachers;
- to determine the methodological system for organizing the research activities of future teachers in the context of digital education.

The significance of the research results is due to its contribution to the theory and practice of digital learning in the higher education system, opening up access to non-traditional sources of information, teaching aids and forms for students and teachers, contributing to the development of research competencies, taking into account the increase in the level of self-organization.

Research materials and methods. To solve the tasks set, the following research methods were used:

- theoretical research methods. Analysis of scientific works (pedagogy, didactics, methods of teaching chemistry); differentiation and generalization of the experience of applying modern methods of self-development, creative search of students in the process of teaching chemistry;
- empirical research methods: survey (oral and written) and conversation methods; statistical methods of processing the results; organization and conduct of a pedagogical experiment.

The pedagogical experiment was organized at the stages of detection, formation and control.

Research results discussion. During the determining stage of the experiment, the following tasks were solved: to determine the initial level of development of the research competence of the future chemistry teacher; to conduct an experiment of various forms of training sessions; to determine their effectiveness in terms of the formation of components of the research competence of students aimed at personal development. The experiment was attended by students of the 4th year of the educational program 6B01512-Chemistry (86 students) of the Khoja Akhmet Yassawi International Kazakh - Turkish University.

As a result of the survey, the majority of students (86%) will be able to use digital technologies in the educational process. For the remaining 30%, the use of digital technologies in the educational process is hindered by insufficient digital tools and low internet connection. At the same time, 26% of students found low skills in using digital technologies. As the students noted, most of the information about the lecture and practical classes became available through its digitization, which allows the student to implement the process of Continuing Education, form knowledge, skills and abilities on digitalization. According to the students, teachers are actively introducing modern digital technologies into their educational practice. However, a significant number of students (40%) showed that they cannot independently work with ready-made circuitry programs and create digital products, such as online tests and video content.

Taking into account the results of the survey, a methodological system was compiled (Figure1).

Chemistry is an experimental science, and therefore a chemical experiment can be both a method and a means of teaching. In the implementation of experimental laboratory work in chemistry in educational laboratories at the school, there are problems that need to be resolved quickly and efficiently due to the importance of compliance with safety measures, the expiration and availability of chemical reagents and installations.

In this regard, the need to effectively use the pedagogical potential of digital technologies is important. At the stage of formation of the implemented pedagogical experimental work, students performed chemical experiments in grades 7-11, developed video content about its progress, mastered the practice of using mobile applications and virtual chemical laboratories.

The development of research competence of students of Bachelors of chemistry in the process of teaching in a higher education organization is considered as a special form of joint work of the teacher and students. For this purpose, students wrote a project. During the writing of the project, ABC-Chemistry, Beilstein Journal of Organic Chemistry, Chemical Search Engine, ChemRxiv, e-Books Directory, Organic Chemistry Portal, Thieme, Open access journals worked with resources to help keep abreast of the latest global trends and news in the field of chemistry. It was aimed at revealing the personal, creative, personal potential of each subject

in the educational process. He worked with databases of chemical structures and reactions, such as ChemSpider, ChemSynthesis, MatWeb material Property data, Periodic Table, in accordance with the need to recognize and distinguish chemical objects, processes, and research. This contributes to the formation of such skills of the individual as the organization, conduct, implementation of research work in chemical laboratories. Allows students to independently acquire knowledge, present and formulate their own thoughts and opinions.

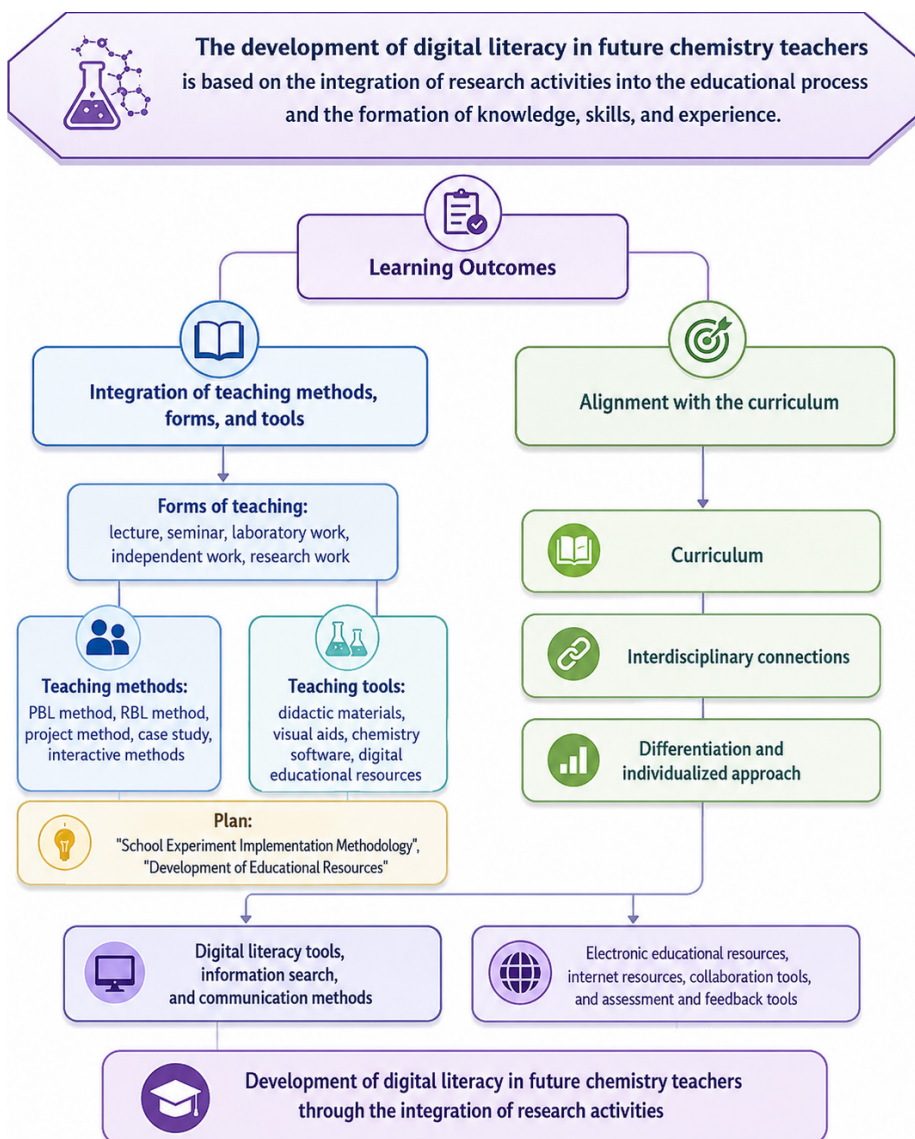


Figure 1 — Methodological system for the development of research competencies of future chemistry teachers in digital education.

On the basis of these, we conducted classes with a special methodology in the framework of the disciplines «Methods of preparing visual aids», «Methods of conducting experiments at school» for 4th year students studying under the educational program 6B01512-Chemistry at the formative stage of the pedagogical experiment. During the lesson, internet resources and various mobile programs were used. The figure below shows a sequence of programs that can be used in the course of conducting experimental subjects (Figure 2).

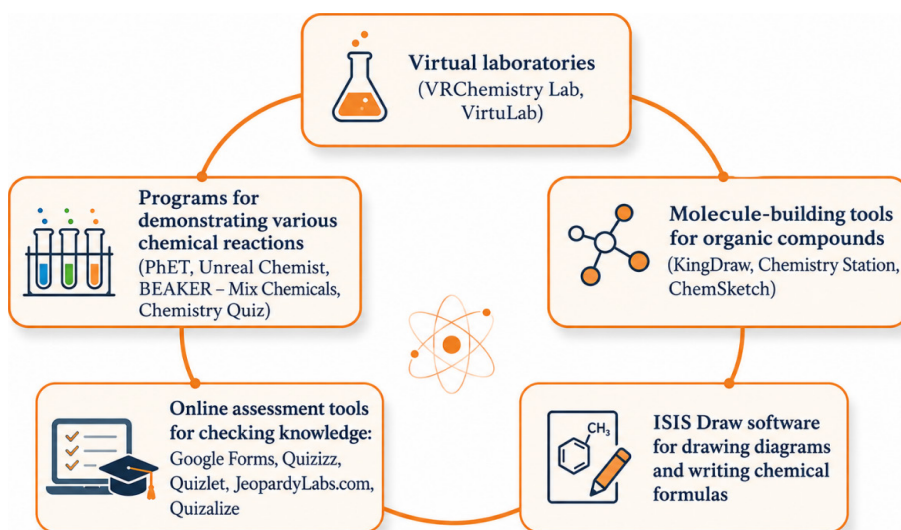


Figure 2 — Digital programs used in the organization of classes in the disciplines «Methods of conducting experiments at school», «Methods of preparing visual aids».

A methodology for determining the formation of the components of research competence at different stages of the pedagogical experiment has been developed. In the course of the experiment, the volume of knowledge, the quality of learning (QL) and the level of learning (LL), the effective use of working time and the speed of the student's performance of activities were taken as the basis of quantitative indicators. In addition to the above indicators, research skills such as the correctness, accuracy and independence of actions, and the stability of skills were also taken into account.

It is also necessary to take into account the qualitative indicators of the formation of skills. We took into account in the Labor Organization indicator during the study. It included the following important components: the ability to set tasks, plan educational activities, exercise self-control and search for the optimal method of activity.

The table below presents indicators for assessing the effectiveness of research competence in terms of indicators of the quality of learning and the level of learning (Table 1).

Table 1 — Assessment table.

Level of Knowledge Acquisition	Control Group		Experimental Group	
	Before the Experiment	After the Experiment	Before the Experiment	After the Experiment
Quality of Learning	59%	73%	61%	82.6%
Learning Level	3.8	3.9	3.7	4.4

To determine the level of development of research competencies of future chemistry teachers in the context of digitalization, the results of teaching the disciplines «Methodology for conducting a chemical experiment at school», «Methodology for preparing visual aids» by a special methodology were taken as a basis. Research competence was determined by the level of activity and development of cognitive and personal components. The level of formation of structural components of the development of research competence of students is shown in Table 2.

Table 2 — Structural components of research competence

Component / Level	High Level	Medium Level	Low Level
Activity	60%	37%	3%
Cognitive	55%	40%	5%
Personal	76%	23%	1%

At the level of activity, 60% of the research competencies of future chemistry teachers are formed at a high level. Future chemistry teachers combine the laws of Chemical Education and pedagogy. Identify and master the main methods of analysis of pedagogical situations and ways to use professional reflection. He is able to understand the scientific foundations of chemistry in accordance with the requirements of pedagogical education based on special scientific knowledge. 37% of future chemistry teachers face difficulties with methods of analyzing the pedagogical situation.

At the cognitive level, only 55% of students are formed at a high level according to subject testing: students have a high level of knowledge of the system of special scientific knowledge in chemistry; they are able to explain the sections of chemistry from a didactic point of view; Know, apply, formulate, critically evaluate the scientific foundations of the discipline. However, 40% of students have an average level of formation. They are ready to apply the knowledge gained in the subject area, but there are some difficulties associated with research competence and express some uncertainty about the level of formation of subject knowledge. Future chemistry teachers demonstrate a high level of knowledge, skills and abilities of students at the personal level in the development of research competencies (76%). Students have a high level of activity and are able to organize and carry out pedagogical activities on the basis of special scientific knowledge in the context of digital education.

In the process of transforming education, the development of research competence is significantly influenced by the digitalization of the modern educational process from the point of view of a competence approach. The basis for the approaches to the formation of research competencies of future chemistry teachers can be activity, cognitive and personal components.

The technology of formation of research competence, tested using modern teaching methods and forms of Organization of Educational Progress, has significant advantages and is important for the student to actively organize research work on the implementation of research projects. Adapts faster to the specifics of future professional activities. In this case, the student feels himself not only as an object of pedagogical influence, but also as a subject of his own activity.

Conclusion. The development of the digital society, in turn, also brings great changes in the field of Education. The demand for innovative teachers who are prone to changes in the field of education and are able to exert their own influence is growing day by day. From this point of view, it is important to develop research competence in the training of future teachers. Our research work was carried out with students of the educational program 6B01512-Chemistry. In accordance with the goals set out in the article, we analyzed scientific works and identified the theoretical foundations of the development of research competence of future chemistry teachers in the context of digital education. As a result, we were able to develop an effective methodological system for the implementation of this process. And in the course of the experiment, we determined the effectiveness of the proposed methodological system and proposed the following conclusions:

1. The development of research competence of future chemistry teachers in the context of digital education can be a guarantee of future professional activity and personal development as a specialist.

2. The methodological system proposed by us can be effective and provide in the process of developing the components of the research competence of future chemistry teachers.

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