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## SOME ISSUES OF DEVELOPMENT OF PROFESSIONAL COMPETENCY OF PERSPECTIVE CHEMISTRY TEACHERS

### Abstract

The main aim of the paper is to conduct a comprehensive exploration into the effective cultivation of professional competencies among prospective teachers in the learning process. In this regard, the research objectives have been determined, namely: to reveal the essence of the term "professional competency", to delineate the issues of cultivation of professional competencies among perspective chemistry teachers, and to formulate recommendations through examination and analysis of effective strategies of enhancing the professional competence of pedagogical university students. An overview of the theoretical methodologies used in the perspective specialist training was undertaken, delving into conceptual terms such as "competence", "competency", "professional competency". Utilizing the method of content analysis, the concept "professional competency" was analyzed based on a synthesis of domestic and international research findings. Employing a survey method, the research investigates the issues of cultivation of professional competencies in the chemistry teacher training, the assessment of the extent to which students' professional competencies are cultivated, the impact of practical experience on the development of competence and the assessment of the importance of digital technology in this process. Recommendations on effective strategies for fostering the professional competency among future teachers have been delineated.

**Keywords:** competence, professional competency, communicative competency, normative competency, intellectual-pedagogical competency, digital technology, digital resources.

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## БОЛАШАҚ ХИМИЯ ПЕДАГОГТАРЫНЫҢ КӘСІБИ ҚҰЗЫРЕТТІЛІГІН ДАМЫТУДЫҢ КЕЙБІР МӘСЕЛЕЛЕРІ

### Аннотация

Мақала болашақ мұғалімдердің кәсіби құзыреттіліктерін оқу процесі барысында тиімді қалыптастыру мен дамыту жолдарын егжей-тегжейлі зерттеу мақсатында жазылған. Осыған байланысты зерттеу жұмысының міндеттері анықталды: «кәсіби құзыреттілік» ұғымының мәнін ашу, болашақ химия педагогтарының кәсіби құзыреттілігін қалыптастыру мен дамытудың мәселелерін көрсету, педагогикалық университет студенттерінің кәсіби құзыреттілігін дамытудың тиімді жолдарын зерттеу және талдау арқылы ұсыныстар дайындау. Болашақ мамандарды даярлауда пайдаланылған теориялық әдістерге шолу жасалып, «құзырет», «құзыреттілік», «кәсіби құзыреттілік» ұғымдарына анықтама келтірілді.

Отандық және шетелдік зерттеулерге сүйене отырып, «кәсіби құзыреттілік» ұғымына контент-анализ әдісімен талдау жүргізілді. Химия педагогтарын даярлауда олардың кәсіби құзыреттілігін қалыптастыру мен дамытудың мәселелері, білімалушылардың кәсіби құзыреттіліктерінің қаншалықты қалыптасқандығы, құзыреттілікті дамытуға іс-тәжірибенің әсері және цифрлық технологияның маңыздылығы сауалнама әдісімен анықталды. Болашақ мұғалімдерді даярлауда олардың кәсіби құзыреттілігін дамытудың тиімді жолдары бойынша ұсыныстар әзірленді.

**Түйін сөздер:** құзырет, кәсіби құзыреттілік, коммуникативті құзыреттілік, нормативтік құзыреттілік, интеллектуалдық-педагогикалық құзыреттілік, цифрлық технология, сандық ресурстар.

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## НЕКОТОРЫЕ ВОПРОСЫ РАЗВИТИЯ ПРОФЕССИОНАЛЬНОЙ КОМПЕТЕНТНОСТИ БУДУЩИХ ПЕДАГОГОВ ХИМИИ

### Аннотация

Статья написана с целью детального изучения путей эффективного формирования и развития профессиональных компетенций будущих учителей в процессе обучения. В связи с этим определены задачи исследовательской работы: раскрыть сущность понятия "профессиональная компетентность", показать проблемы формирования и улучшения квалификационной компетентности будущих учителей-химиков, подготовить рекомендации путем исследования и анализа эффективных способов развития профессиональной компетентности студентов педагогических вузов. Проведен обзор теоретических материалов, использованных при подготовке будущих специалистов, приведены определения понятий «компетенция», «компетентность», «профессиональная компетентность». На основе отечественных и зарубежных источников проведено исследование понятия «профессиональная компетентность» методом контент-анализа. Методом анкетирования были определены проблемы формирования и развития профессиональных компетенций педагогов-химиков, степень сформированности профессиональных компетенций обучающихся, влияние педагогической практики на развитие компетенций и значимость цифровых технологий. Разработаны рекомендации по эффективным путям развития профессиональной компетентности будущих учителей.

**Ключевые слова:** компетенция, профессиональная компетентность, коммуникативная компетентность, нормативная компетентность, интеллектуально-педагогическая компетентность, цифровые технологии, цифровые ресурсы.

**Basic provisions.** The significance of professional competency: The professional competency among perspective chemistry teachers is crucial in ensuring high quality education. It covers the knowledge, skills and attributes necessary for effective instruction of chemistry to students.

**Integration of digital technology:** The integration of digital technology in the teaching of chemistry is at the forefront in the contemporary education. Future teachers should master the use of digital tools, virtual laboratories, electronic textbooks and improve teaching methodologies.

**Reflective practice:** Encouraging prospective teachers to engage in reflective practice is essential. This includes self-evaluation, setting professional development goals, and taking responsibility for their own growth as educators.

**Global best practices:** Learning from international best practices and competency standards in teacher development can provide valuable insights to enhance the training of future chemistry teachers.

**Impact on student learning:** Ultimately, developing the professional competency of perspective teachers should contribute to improving student learning outcomes. Assessing the impact of teacher competency on student achievement is a significant facet of this process.

These key points should provide an initial basis for solving the challenges related with the cultivation of professional competency among perspective chemistry teachers.

**Introduction.** The rapid development of pedagogical science in recent decades requires a timely exploration of approaches to enhance the professional training of perspective specialists, particularly those involving the field of education. Nowadays, one of the main social requirements for university graduates is the development of a complex of professional competencies. President K.J. Tokayev noted that "It is necessary to reorient the entire vocational education system to the development of competencies that are in demand in the labor market. This means that quality is the main priority in the training of specialists in educational organizations in the future" [1].

Within the Kazakhstani education, substantial strides are underway to solve the important objectives of raising a competitive generation. Currently, it is essential to foster the student's personal abilities and cultivate individuals who are not only professionally adept but also socially competent and adaptable. It is crucial for perspective professional to make correct professional decisions and respond for them [2, p-191]. A teacher's professional abilities are directly related to their readiness for self-development. In order to consider this issue from a socio-pedagogical point of view, the level of readiness of the teacher to fulfill the tasks assigned to him/her is considered important. Accordingly, competence formation and development is an urgent issue within the educational landscape. Consequently, it is necessary to organize the development of methodological creativity in the continuous professional development of educators.

"The state program for the development of education in the Republic of Kazakhstan for 2020-2025 calls for improving the quality of the content of vocational education, increasing its competitiveness, modernizing the system of vocational and technical education in the world's advanced trends and context, as well as improving the practical training of future teachers" [3, p-5].

Besides, the relevance of cultivating the professional competence of future teachers remains one of the important topics within educational landscape in varied countries. Qualification standards of teachers are continuously updated and supplemented, taking into account changes in requirements for standard education. For instance, in 2018, the International Association for the Evaluation of Educational Achievements published a report based on research conducted in 14 countries, which shows that the quality of learning is directly related to the qualifications and competence of teachers. Therefore, the cultivation of professional competence of perspective teachers is a crucial objective for ensuring the high quality of global education.

Looking ahead, perspective specialists are envisioned to possess creative abilities of students, teaching them to reach a high level of intellectual activity, understanding novel concepts, identifying deficiencies in education, and fostering competitive orientation [4, p-1134]. Consequently, in order to develop students' professional abilities, university teachers need to constantly expand their thinking and improve their knowledge. It is deduced that the teacher should first of all be a creative human, must be capable think comprehensively, create a competitive atmosphere in the classroom and organize the learning process at the university with intellectual activity.

Recognizing the multifaceted roles of a teacher as a teacher is a friend, leader, inventor and instructional guide in modern society, the role and competence of the teacher should be modernized [5, p-32], so the teacher should be educated with a critical and original attitude. During the lesson, the students' self-development and self-preparation are taken into consideration, and by creating tasks and answering questions according to the class content, they can express their thoughts clearly. The spectrum of teacher competencies includes high academic abilities, emotional qualities, and in addition to the ability to be fair, such qualities as mastery skills and classroom leadership [6, p-68].

**Materials and methods.** Despite the widespread use of the concept "competence", the essence of this concept requires deep scientific analysis and rationale. The initial phase of our analysis involves a fundamental inquiry: "What does this concept mean?" Numerous domestic and foreign studies have undertaken a comparative exploration in determining the distinctions between "competence" and "competency".

Pedagogical and psychological aspects of "competence" and "competency" were studied by foreign scientists R. Arnold, G.Vlumenstein, J.Raven, K.Rogers, I.V. Robert, S.Whiddet, S.Hollyforde, R.Heine and others. considered.

The analysis of works by Russian and domestic scientists such as A.A.Verbitsky, V.A. Metaeva, N.N. Nechaev, G.I. Reznitskaya, A.G. Bermus, Yu.Yu. Gavronskaya, I.A. Zimnya, A.V. Khutorsky, R.N. Azarova, N.M. Zolotareva, I.B. Kostileva, V.N. Mikhelkevich, N.F. Talyzina, N.T. Pechenyuk, L.B. Khikhlovsky, N.I.Almazova, M.S.Minko, V.P.Bespalko, V.D.Shadrikova, Sh.Taubaeva, K.S. Kudaibergenova, B.T. Kenzhebekov, G.Zh. Menlibekova, A.K. Mynbaeva, A.B. Aitbaeva, A.M. Kudaibergenova, B.Turgynbaeva and others has contributed to reveal the meaning and content of terms "competence" and "competency".

Domestic scientist K.S. Kudaibergenova defines "competence" in pedagogy as the result of focusing on an individual's subjective experience, which means comprehensive knowledge, an expert in a specific field. She believes that the terms of "competence" and "competency" differ as follows:

- knowledge distinction – a non-informational yet productive service;
- skill distinction – a conscious action capable of changing phenomena and laws by studying the material and using creativity;

– mastery distinction – not automatic acquisition or change of skills, but a set of skills in several disciplines, a common understanding of the basics of service [7, p-33].

American psychologist R. Short reveals the value of the term "personal competence". The author describes a competent person as a person who knows the "fundamentals of science" and has skills related to them as well psychomotor functions, professional roles, cognitive activities, and "interpersonal communication" [8, p-66].

Psychologists studied personality traits, leading to the deduction that the structure of any quality is the same and it consists of 4 components: feelings, behavior, consciousness and skills. These components increase the individual traits of the educator and foster professional competence [9, p-232].

So, according to foreign scientist J. Raven, competence is a multifaceted construct, encompassing numerous relatively independent components. These components, categorized as cognitive and emotional, can replace each other as a component of effective behavior [10, p-253].

The exploration of the terms "professional competency" and "professional competency of a chemistry teacher" has been undertaken by the following scholars K.V. Shaposhnikov, A.K. Markova, T.E. Isaeva, E.G. Zlotnikova, M.S. Park, I.A. Orlova, M.K. Toletova, Yu.Yu. Gavronskaya, M.Yu. Churkina et al.

Factors that initiate the improvement of professional competence I.A. Zimnyaya, E.F. Zeer, N.V. Kuzmina, A.K. Markova, L.M. Mitina, V.A. Slastenin et al. can be conceptually grouped into three categories: changes in the leadership function, the social situation of development and the subjectivity of the person.

J.M. Akparova considered professional competency as communicative, normative and intellectual-pedagogical competence:

– communicative competence is a professional integrative quality, which is based on emotional stability, language skills, listening skills, rewarding, tact, general ability;

– regulatory competence refers to the teacher's ability to manage actions, including purposefulness, planning, constant activity, self-expression, reflection, evaluation of action; the main factor of action is kindness, value;

– intellectual-pedagogical competence comprises a set of analytical skills, applied for effective teaching and innovative action [11, p-87].

Reviewing the works of scholars, it can be perceived that competency is the core of perspective teachers. One of the relevant issues of modern education is to train perspective chemical specialists to use their professional personality traits and knowledge in practice in life. Therefore, it can be shown that one of the basic indicators of the level of professionalism of teachers is professional competency.

Foreign researchers have classified professional competency into four areas [12, p-21]: classroom teaching competence, management competence, class communication and activity competence. Some studies [13 and 14] also confirmed the need for professional competence in schools to cope with the 4th industrial revolution and 21st century skills in order to achieve digital transformation.

Thus, a modern chemistry teacher teaches taking into account the psychological and physiological features of schoolchildren and the specificity of the taught subject and using various forms, methods and pedagogical technologies; while ensuring the quality of the learning process, it uses modern tools to assess the academic performance of students. Pedagogical technology serves to boost student motivation for independent language learning, inspires aware actions in communicative circumstances, improves reasoning ability, idealistic moral reasoning and realistic moral reasoning [15 and 16]. The future chemistry teacher should learn all this during professional training at the university and in this process improve the quality of selection of teaching and educational methods and organizational forms using digital technologies; creation of a methodological training system aimed at fostering the skills of students to learn and process knowledge on their own; self-monitoring, computer testing methods and the preparation and use of electronic textbooks that allow students to assess their level of knowledge, etc., should come up with the enhancement of the educational process. Many technologies used during modern education are endeavored to develop the individual, create the foundation for the effectiveness of education. Therefore, educational content update, developing a continuous education system is the objective law of today [17, p-99].

The ongoing theoretical analyses, as outlined above, employed content analysis and survey methods to extract and synthesize definitions from domestic and foreign scholars concerning professional competency.

1 Table - Content analysis of the "Professional Competency" concept

Scientists	Definitions of Professional Competence
B.T. Kenzhebekov	professional competency among university students is the integration of theoretical and practical inclination and ability of an individual to perform professional activities
J.H. Salkhanova	a group characterized by the level of the professional knowledge, skills, personal abilities, striving to constantly enhance the professional level, creative and responsible approach to business
Shelten	special (having special knowledge), social (a positive idea of own personality, communication skills with other people, the ability to behave in a team), methodological (the ability to independently find ways to solve complex problems, self-education, self-development) competence offers as a set.
E. Doule	defines "the ability to adapt quickly and without conflict to specific working conditions" as the most essential part of an employee's qualification.
K.V. Shaposhnikov	the readiness and ability of a specialist to make effective decisions in professional activities.
B.S. Gershunsky	it covers two different aspects: first, knowledge of the science or science that form the basis of a particular profession. Secondly, the ability and skills to use acquired knowledge in practice. In other words, professional competency consists of a person's cognition in expertise area ability and application of that knowledge at work.
A.K. Markova	considered that it is characterized by a combination of mental state and mental qualities that allow to take independent and responsible steps, to perform labor functions with ability and accuracy.
N.V. Kuzmina	<ul style="list-style-type: none"> <li>- having special knowledge about the purpose, content, object and tools of the teacher's work;</li> <li>- acquisition of special skills in the preparation, execution and final stages of the service;</li> <li>- mastering the special qualities of personality and character that allow to implement the action process and get the desired result.</li> </ul>

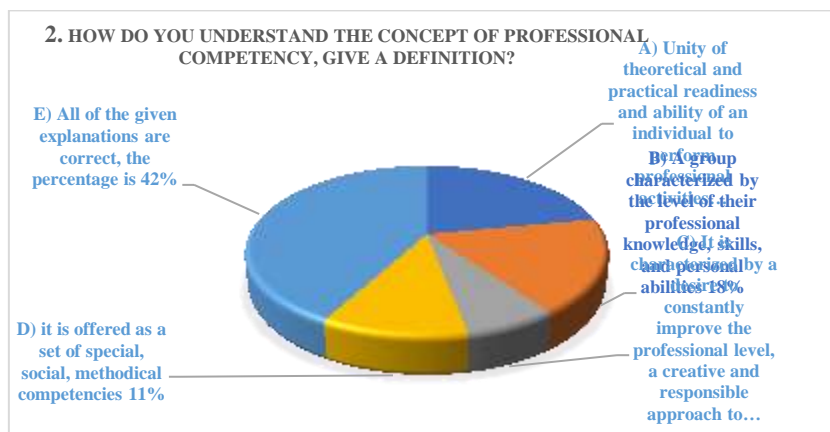
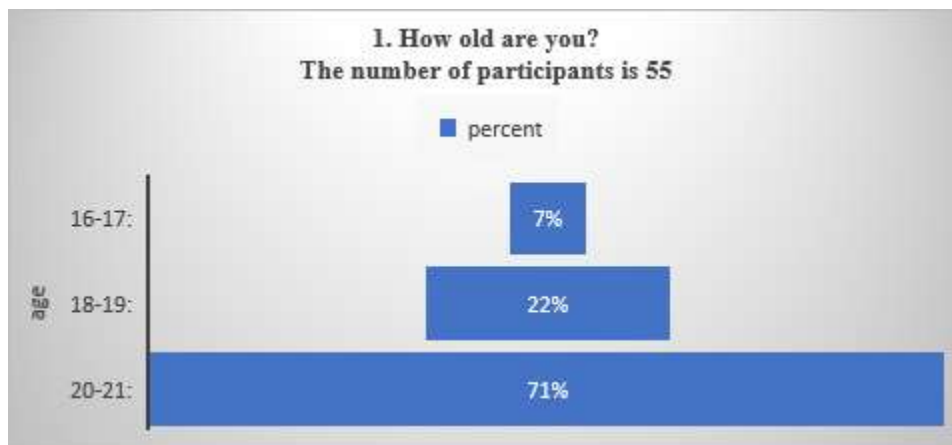
The exploration the term "competence", "competency", "professional competency" has under-gone a comprehensive examination. Summarizing the concepts of scientists, we can draw a conclusion: competence is an integrative personality trait, that is, knowledge, skill, ability and professional personal qualities. Competence is an ability to apply acquired knowledge in practice, to solve own life problems, professional competency is the ability of a specialist to autonomously and responsibly make effective decisions within their professional activities, the combination of professional qualities and theoretical and practical training.

In conducting research aimed at training perspective specialists, an author's questionnaire "Assessment of the level of acquisition of professional competency of students" was conducted with students to determine the extent to which the professional competences of students have been formed, the influence of practical experience on the development of competence, and the importance of digital technology. The questionnaire consists of ten questions, the students answered the questions electronically. 58 students enrolled in the 2nd and 3rd years of South Kazakhstan State Pedagogical University, Faculty of Natural Sciences, Department of Chemistry, specializing in 6B01504-Chemistry Teacher Training and 6B01507-Chemistry-Biology Teacher Training, took part in the survey.

**Results and discussion.** The survey outcomes are presented in the chart below, presenting the students' responses in percentage form.

Purpose: To assess the extent to which the students fully form professional competency.

Instructions: To complete the questionnaire, respondents were instructed to select one of three options: "yes", "no" or "don't know".



According to the responses to the survey question, Option E "All of the given explanations are correct" received the highest percentage of responses (42%). This indicates that a considerable proportion of respondents believe that multiple explanations (A, B, C and D) contribute to their comprehending of the term "professional competency". However, options A, B, C and D received some support, albeit to varying extents.

The survey results show that respondents have different views regarding the definition of "professional competency". Notably, a substantial number selected the option that all of the given explanations are correct. It suggests that the concept of "professional competency" may not have a single, universally agreed definition and that it covers a number of aspects, including theoretical and practical training, knowledge, self-esteem, responsibility and social competences. These findings may be valuable for understanding the different dimensions of the concept perceived by the respondents.



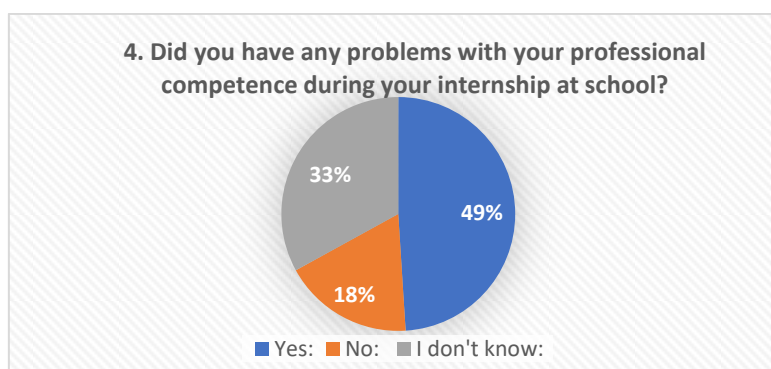
This survey probes respondents regarding their perception of their readiness in professional competence for future professional activities. The findings are as follows:

24% of respondents answered in the affirmative ("yes"), which means that a limited number of respondents believe their professional competency is fully developed for forthcoming professional activities.

Conversely, 26% responded in the negative ("no"), which indicates that another small number of respondents do not believe that their professional competency is fully formed for future professional activities.

The highest percentage, at 50%, chose "I don't know." This shows that a significant part of the respondents is not confident in their readiness regarding professional competence for future professional activity. Many respondents may feel that additional information or self-assessment is needed to determine whether they are fully competent for their future professional activities.

In summary, this question shows a wide range of responses, highlighting a considerable portion of respondents expressing uncertainty about their professional competency. This information can be useful in identifying areas where individuals seek further development or clarity in their professional skills and training.



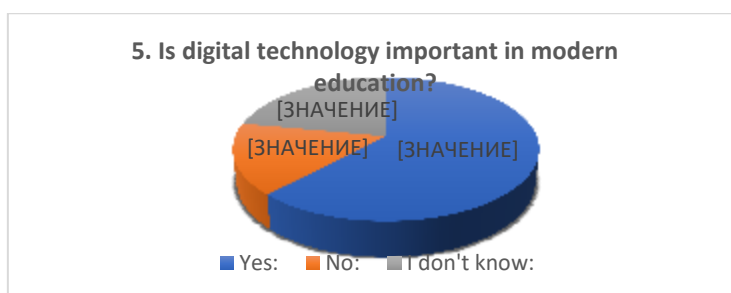
This survey question aims to ask the respondents' reflections on their experiences regarding the challenges they face in acquiring professional competency during practical lessons at school. The findings are as follows:

49% of respondents answered in the affirmative ("yes"), which indicates that almost half of the respondents had difficulties in acquiring professional competence during practical lessons at school.

Conversely, 18% responded in the negative ("no"), indicating that a minor number of respondents did not face challenges during practical training in the acquisition of professional competency.

A notable 33% of responses fell under "I don't know," which is a relatively high percentage. This suggests that a significant proportion of respondents may be unsure or have mixed feelings about whether they encountered challenges during practical sessions. Some respondents may have experienced both challenges and successes during their practical training, making it difficult to give a definitive yes or no response.

In conclusion, this question shows that a significant number of respondents faced challenges during practical training in the acquisition of professional competency. It also highlights the considerable variability in experiential learning among respondents, leading to uncertainty for some. This information can be valuable for schools and educational programs to understand the challenges students face during practical classes and improve their curricula accordingly.



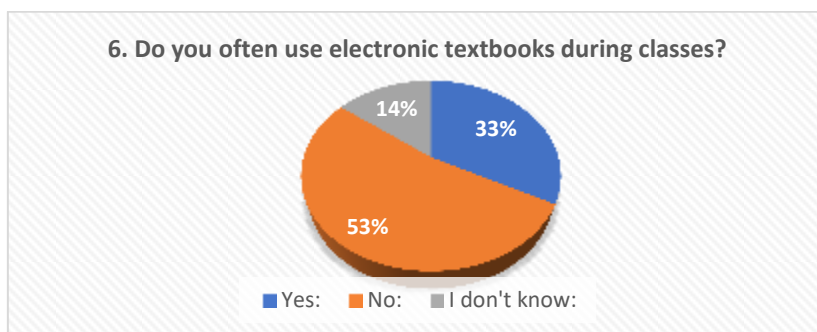
This survey question was designed to assess respondents' views on the importance of digital technology in education. The findings are as follows:

62% responded affirmatively, indicating that a significant majority of respondents believe that digital technology is important in education. This presupposes a recognition of the role of digital technology in enhancing the educational experience.

In contrast, 16% responded negatively ("no"), indicating that a minority of respondents do not consider digital technology important in education. This could be due to a variety of reasons, including an over-reliance on technology or a possible concern about a preference for traditional teaching methods.

"I don't know" received 22% of responses, which is a relatively high percentage. This suggests that a significant proportion of respondents may not have a clear view of the importance of digital technology in education, possibly due to lack of knowledge of the subject or mixed feelings. Some respondents may also be unsure about cons and pros digital technology in education.

In conclusion, the majority of respondents believe that digital technology is important in the field of learning, but a significant number doubt its importance or do not consider it important. This information can be valuable for educational organizations and policy makers when making decisions regarding the integration of digital technology in education.



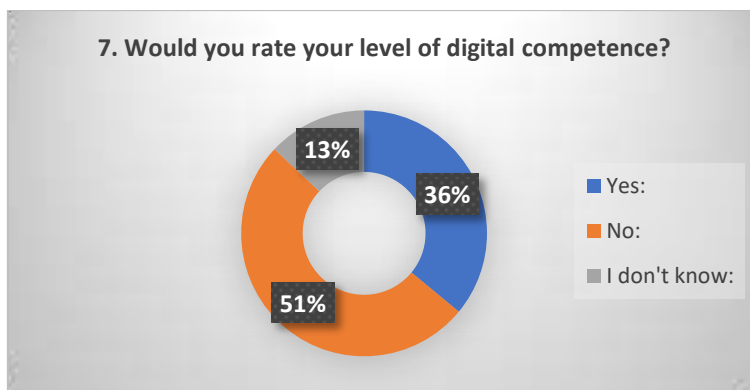
This survey was designed to assess the frequency of utilization of e-textbooks in the classroom. The findings are as follows:

33% responded affirmatively (yes), which means that a minority of respondents regularly use e-textbooks in their classes. This may indicate a relatively low level of use of e-textbooks in teaching.

In contrast, 53% responded negatively ("no"), indicating that most of the respondents do not use e-textbooks during class. This may indicate a need for greater awareness, training, or resources regarding digital learning materials in educational contexts.

14% of the answers "I don't know" is a significant percentage. This indicates that a significant part of the respondents may not have a clear understanding of the use of e-textbooks in their classes. This lack of awareness may be due to factors such as limited access to e-textbooks or lack of training in their use.

Overall, these findings provide insight into the current level of adoption of e-textbooks in teaching and suggest that there may be room for potential growth in this area by supporting teachers in integrating digital resources into their learning and lessons.





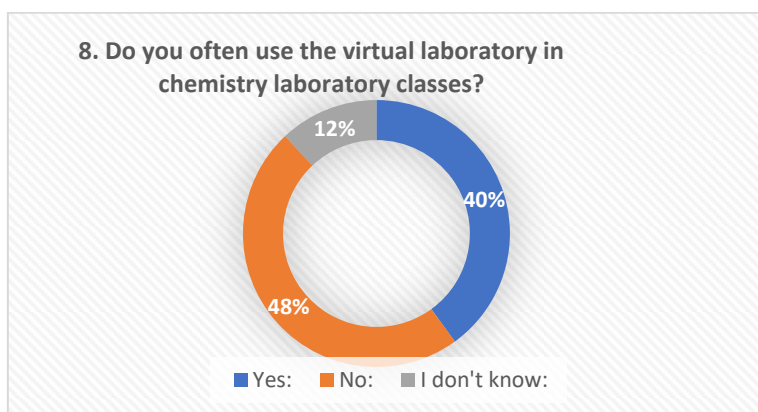
This survey question aims to assess respondents' self-assessment of their digital competency. Here is a breakdown of the responses:

36% of 'yes' responses were received, indicating that a minority of respondents consider themselves to possess a high level of digital competence. These people feel confident in their digital skills and abilities.

51% answered "no", indicating that the majority of respondents do not rate themselves as having a high level of digital competence. This may mean the need for further training and development of digital skills within their professional activities, especially in the field of learning

13% of the answers were "I don't know". This suggests that a relatively small number of respondents may be unsure of their level of digital competency, or may lack accurate self-esteem for that matter.

Overall, these findings suggest that there may be possibility for improvement in enhancing the digital competence of educators through training and support programs to increase their confidence and capabilities in using digital technologies in teaching.



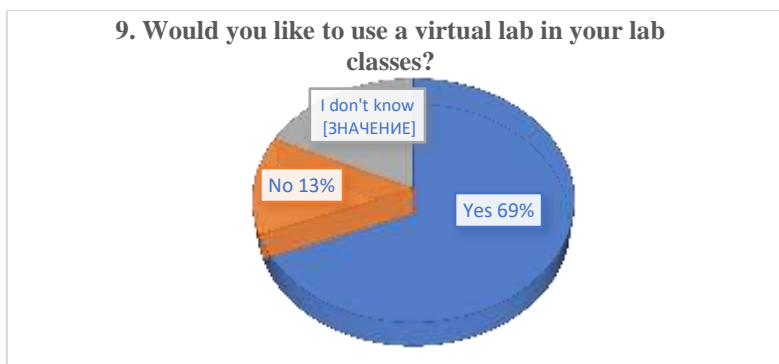
This survey aimed to understand respondents' frequency of applying virtual labs in their chemistry classes. Here is a breakdown of the responses:

40% of the responses were affirmative ("yes"), indicating that a minority of respondents frequently apply virtual labs in their chemistry classes. These respondents incorporated virtual laboratories into their teaching methods.

48% responded negatively ("no"), indicating that a significant proportion of respondents do not apply virtual labs in their chemistry classes. This may be due to a variety of factors, including limited access to technology, lack of training, or a preference for traditional teaching methods.

12% of the answers were "I don't know". This suggests that a relatively small number of respondents may be unsure about using virtual labs or may not have clear information on the subject.

Overall, these findings suggest that there may be opportunities to promote the use of virtual laboratories in chemistry classes and to provide training or resources to help teachers effectively incorporate them into their teaching.



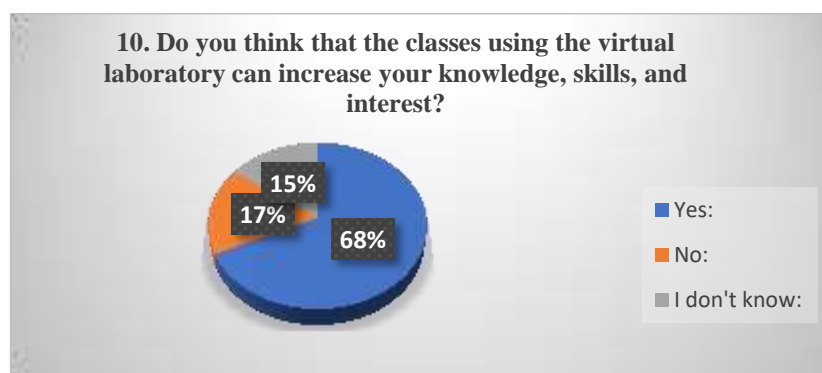
This survey aims to determine respondents' interest in applying a virtual laboratory in laboratory classes. Here is a breakdown of the responses:

69% of affirmative responses ("yes") were received, indicating that most of the respondents are very interested in applying the virtual lab in their lab classes. This indicates that a significant number of respondents would like to incorporate digital tools and simulations into their practical learning experience. This interest may be fueled by the recognition of the potential benefits of virtual laboratories, such as increased accessibility, safety, and the capability to implement experiments not possible in traditional laboratories.

"No" response was answered by 13%, indicating that a minority of respondents are not interested in applying virtual labs during lab sessions. They want a traditional hands-on lab experience.

"I don't know" was given by 18% of the answers. This indicates that a certain part of the respondents may not have a clear position on this issue or may not have enough information about the potential benefits of applying virtual laboratories.

Overall, these findings indicate a favorable attitude toward integrating virtual labs into lab classes among students surveyed, but some respondents may need more information to make an informed decision.



This survey question aimed to understand respondents' beliefs regarding the potential benefits of utilizing a virtual lab in classrooms to enhance their knowledge, skills, and interests. Here is a breakdown of the responses:

68% of the responses were affirmative (Yes), indicating that the vast majority of respondents believe that utilizing a virtual lab during class can enhance their knowledge, skills, and interest. This positive perception may be influenced by the advantages of virtual laboratories, such as accessibility, safety, and the ability to conduct experiments that are not possible in traditional laboratories.

17% of respondents gave negative response, indicating that a minority of participants do not believe that utilizing virtual labs will have a positive impact on their knowledge, skills, or interests. These people may have reservations about the effectiveness of virtual labs compared to traditional methods.

15% of the answers were "I don't know". This suggests that a certain proportion of respondents may have uncertainty or differing opinions regarding the potential benefits of using virtual labs.

The research findings confirm the timeliness of the issue of cultivation of professional competency among perspective chemistry teachers. It is especially important for modern educators to manage to independently find solutions to complex problems and to manage to utilize the gained knowledge in pragmatical way. In addition, they need to learn how to utilize new learning technologies and effectively integrate digital tools during the lesson. However, research highlights that students possess challenges solving these problems during practice. Consequently, it is crucial to concentrate to increasing the professional competency among learners in the process of education.

The utilization of digital technologies in chemistry classes is an momentous aspect of professional competency growth. In today's world, digital technologies are actively used in various fields, including education. They can greatly simplify the learning process and greaterits productivity. In her work, Zhubandykova determined that the utilization of digital teaching tools even in primary classes increases the quality of students' learning, their interest in education, accelerates the acquisition of knowledge, and develops cognitive processes such as memory [18, p-104]. The study results also showed that the utilization of digital resources in chemistry classes has a positive impact on the interest and motivation of learners and increases their knowledge and skills. However, there are challenges in introducing these technologies into the classroom. Therefore, there is a need to enhance the skills of learners in utilizing digital technologies in line with the demands of the digital community. This, in turn, will contribute to the adequate development of

digital competency. K.Z. Khalikova, in her study, guided by UNESCO's framework of digital competence of teachers, concluded that the developed digital competence of teachers should be the basis of their professional development [19, p-153]. Based on the obtained data, it is possible to draw a conclusion about the need for effective utilization of digital technologies in chemistry classes. However, the effective utilization of digital technologies in the chemistry classroom requires appropriate teacher training. Future teachers need to learn how to use digital resources correctly in the classroom, make the lesson interesting and informative for the students, and use effective methods of organizing the lesson. In this regard, a set of recommendations for enhancing the professional competence of future chemistry teachers was developed.

Recommendations:

1. Due to the significant importance of digital technology in increasing the professional competency among perspective specialists, the development of digital resources (electronic textbooks, electronic methodical manuals, virtual laboratories) in the subject of chemistry and their application during lessons;
2. Conducting an additional course that teaches students many platforms and modern technologies in order to train a professionally competent specialist;
3. Revitalization of competence development centers on the basis of higher educational institutions in order to extend the professional competency of students;
4. If there was a common social network for all schools and universities across Kazakhstan, through which students and teachers could exchange experiences, share news and achievements, it would contribute to the increase of the standard of education, that is, the cultivation of professional competencies [20, p-139].

**Conclusion.** Based on the research results, we can conclude that to ensure professional-pedagogical orientation and educational process, characteristics need to be studied it is necessary to study the features of the future work of students and master the components of pedagogical expertise. In addition, the study showed that in order to effectively train future chemistry teachers, first of all, it is necessary to pay attention the cultivation and development of their personal qualities and competence. As part of this process, apart from acquiring theoretical knowledge, students should independently solve problems, apply the acquired knowledge and skills in practice, and develop the ability to work with digital technologies.

At that point, at that point it is worth mentioning digital technologies not only increase the interest of students, but also significantly increase the effectiveness of teaching chemistry by creating interactive and personalized learning formats. However, it is not only important to utilize digital resources in the learning process, but also to use them skillfully, taking into account the characteristics of the student group and the educational material.

Therefore, this is the main purpose pedagogical training process is to strengthen the professional orientation of the training process, increase the professional competence of future chemistry teachers by utilizing digital technologies and to pay attention to the development of personality traits. It follows that each student should be guided by his personal needs and characteristics in the process of learning to achieve the best outcomes in preparing for perspective profession.

It should also be noted the importance of pedagogical experience and teacher's experience. Chemistry teachers must not only master modern teaching methods and technologies, but also possess the skills to motivate and inspire students to study this science. To achieve this, continuous improvement of professional knowledge and competencies along with practical application based on modern science in the field of chemistry is essential.

Partnerships between educational institutions and enterprises engaged in activities related to chemistry is also a crucial aspect of developing professional competency among future chemistry teachers. This allows students to gain practical experience in real-life situations and deepen their knowledge. In addition, such cooperation can contribute to its improvement of new technologies of chemistry and innovative teaching methods.

In general, building of professional competence of future chemistry teachers is a long and multifaceted process that requires continuous work and improvement. However, if future chemistry teachers are trained to utilize digital technologies competently, develop their personal qualities and skills, and apply their knowledge and experience in practice, they will undoubtedly become capable and effective educators who inspire and motivate their students to explore and be creative in chemistry.

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### КЕЙС ӘДІСІН ЖОО-НЫҢ ОҚУ ҮДЕРІСІНДЕ ПАЙДАЛАНУДЫҢ МАҢЫЗДЫЛЫҒЫ

*Аңдатпа*

Мақалада жаңартылған білім беру бағдарламасының талаптарына сәйкес белсенді оқыту әдісі - кейс әдісінің тәжірибелік мүмкіндіктері қарастырылады. Ол екі негізгі бағытта ұсынылады: бірінші – қоғамда білім, ғылымның қарқынды дамуына сәйкес жеке тұлғаның бойындағы қалыптасатын қабілеттерін, ақыл-ой дағдыларын одан әрі дамытуға, оқу материалдарының ақпараттарын өңдей алатындай дағдыларын жетілдіруге бағытталса, екіншісі – осындай күрделі талаптарды қанағаттандыратын құзыретті маманның өзгермелі кәсіби ортада жүйелі де тиімді ерекше әрекеттерімен байланыстырылады.

Болашақ музыка мұғалімі «Негізгі музыкалық аспап (домбыра)» жеке сабағы мен «Музыка пәнін оқыту әдістемесі» курсына құрастырған оқу кейстері арқылы өздерінің аналитикалық ойлау дағдыларын көрсетеді және оны жетілдіре түседі, топпен жұмыс жасау барысында педагогикалық жағдаяттардың ең ұтымды шешімдерін табуға машықтанады. Авторлар, сонымен бірге мектептегі музыка сабағының тақырыптарына сәйкес студенттердің кейстерді өзбеттерінше құрастыру мүмкіндіктерін қарастырып, бірнеше үлгілерін алға тартады.

**Түйін сөздер:** жаңартылған бағдарлама, белсенді оқыту, кейс әдісі, музыкалық білім, оқыту әдістемесі, шығармашылық қатынас, құзыреттілік, сыни ойлау.

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### ВАЖНОСТЬ ИСПОЛЬЗОВАНИЯ КЕЙС-МЕТОДА В УЧЕБНОМ ПРОЦЕССЕ ВУЗА

*Аннотация*

В статье рассматриваются практические возможности метода активного обучения – кейс метода в соответствии с требованиями обновленной образовательной программы. Он представлен в двух основных направлениях: первое – дальнейшее развитие умственных навыков, формируемых способностей личности, совершенствование навыков обработки информации учебного материала и второе – связь с системными и эффективными особыми действиями компетентного специалиста, удовлетворяющий таким сложным требованиям в изменяющейся профессиональной среде.

Будущие учителя музыки демонстрируют и совершенствуют свои аналитические навыки мышления путем составления учебных кейсов в курсе «Методика преподавания музыки» и на индивидуальном занятии «Основной музыкальный инструмент: домбыра», в процессе групповой работы обучаются навыкам поиска рациональных решений педагогических ситуаций. Авторы также рассматривают возможности самостоятельного конструирования студентами кейсов и представляют несколько своих моделей в соответствии с темами школьного урока музыки.

**Ключевые слова:** обновленная программа, активное обучение, кейс метод, музыкальное образование, методика преподавания, творческий подход, компетентность, критическое осмысление.