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Жинаққа студенттердің, магистранттардың, докоранттардың және жас ғалымдардың жаратылыстану-техникалық және гуманитарлық ғылымдардың өзекті мәселелері бойынша баяндамалары енгізілген.

The proceedings are the papers of students, undergraduates, doctoral students and young researchers on topical issues of natural and technical sciences and humanities.

В сборник вошли доклады студентов, магистрантов, докторантов и молодых ученых по актуальным вопросам естественно-технических и гуманитарных наук.

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should be proficient in English at the proper level, and special attention should be paid to the scientific style of speech in English. Before introducing methodological techniques of subject-language teaching, chemistry teachers should determine the level of language training of students. Thus, it is important to increase the effectiveness of studying chemistry by students is the ability of the teacher to explain the material clearly. The teacher should make the material available in lectures, laboratory and practical classes. Also an important element of the teacher's work is the analysis of difficult questions in the classroom, which students prepared independently. This allows international students to develop independent work skills. This makes it easier for students to understand and memorize the material, and for the teacher – the opportunity to study each student and identify the level of his training [3].

To sum up, teaching chemistry in English has many benefits for both teachers and students. It provides access to a wealth of resources and prepares students for international exams and competitions. It also provides an opportunity for students to improve their language skills and become more confident and independent learners. However, teachers need to be aware of the language abilities of their students and provide support to those who need it. With careful planning and support, teaching chemistry in English can be a rewarding experience for both teachers and students.

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COMPARISON OF TRADITIONAL LECTURE-STYLE TEACHING VERSUS PROBLEM-BASED LEARNING IN ORGANIC CHEMISTRY EDUCATION

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Organic chemistry education is important for several reasons, including its relevance to a wide range of career fields, development of problem-solving skills, and promotion of scientific literacy and environmental awareness. It also contributes to personal development by fostering discipline, perseverance, and a strong work ethic. Studying organic chemistry can provide students with valuable knowledge and skills that can be applied in many areas of life.

Traditional lecture-style teaching is a teaching method in which the instructor delivers information to students in a lecture format. The focus is on the instructor, who is the primary source of information, while the students are passive listeners. Students typically take notes and memorize the material presented in lectures to prepare for exams.

Problem-based learning (PBL), on the other hand, is a student-centered teaching method in which students work in small groups to solve real-world problems. The focus is on the students, who take an active role in their learning. Students are presented with a problem, and they must work collaboratively to research and develop a solution. The instructor serves as a facilitator, guiding students through the learning process and providing support as needed.

II. Overview of traditional lecture-style teaching

Traditional lecture-style teaching is a teaching method in which the instructor delivers information to students in a lecture format. Here are some of the key characteristics of traditional lecture-style teaching:

- Instructor-centered: The focus is on the instructor, who is the primary source of information. The instructor delivers the lecture, and students are expected to take notes and memorize the material presented.
- Passive learning: Students are passive listeners in traditional lecture-style teaching. They are expected to listen to the instructor and take notes, but there is little opportunity for interaction or active learning.
- Information-dense: Traditional lecture-style teaching tends to be information-dense, with a lot of material presented in a short amount of time. This can be challenging for some students to process and retain.
- Linear: Traditional lecture-style teaching is often linear, with a clear progression from one topic to the next. This can be helpful for students who prefer a structured approach to learning.
- Assessment-focused: Traditional lecture-style teaching is often focused on assessment, with exams and quizzes used to evaluate student learning. This can create a focus on memorization and recall rather than critical thinking and problem-solving.

The primary source of information in traditional lecture-style teaching is the instructor, who delivers the lecture and provides the information that students are expected to learn. While textbooks and other materials may be used to supplement the lecture, the instructor is typically the primary source of information. [1]

Advantages of traditional lecture-style teaching in organic chemistry education:

Table 1 pros and cons of traditional lecture-style teaching in organic chemistry. [2]

Pros	Cons
Efficient: Traditional lecture-style teaching is an efficient way to deliver information to a large group of students. In a subject like organic chemistry, which can be complex and detail-oriented, traditional lecture-style teaching can help cover a lot of material in a relatively short amount of time.	Passive learning: Traditional lecture-style teaching can lead to passive learning, as students are expected to listen and take notes, but there is limited opportunity for interaction or active learning.
Structured: Traditional lecture-style teaching is often structured and follows a linear progression, which can be helpful for students who prefer a clear organization of information.	Limited engagement: Traditional lecture-style teaching can limit student engagement and motivation, as students may find it difficult to stay focused and interested in a lecture for an extended period of time.
Accessible: Traditional lecture-style teaching is accessible to a wide range of students, as it requires minimal technology and can be delivered in a variety of settings.	Emphasis on memorization: Traditional lecture-style teaching can place too much emphasis on memorization and recall, which may not be the most effective way to learn organic chemistry. This can lead to shallow understanding of the material and difficulty in applying it to new situations.

Studies have shown that traditional lecture-style teaching in organic chemistry education can be effective in delivering information, but may not be the most effective way to promote deep

understanding and critical thinking. A study by Anderson and colleagues (2011) found that students in a problem-based learning course had higher levels of critical thinking and were better able to apply their knowledge to new situations than students in a traditional lecture-style course.

Examples of traditional lecture-style teaching methods in organic chemistry are:

Classroom lectures: This is the most common form of traditional lecture-style teaching in organic chemistry. In this method, the instructor delivers lectures on various topics related to organic chemistry to a group of students in a classroom setting. The students are expected to listen and take notes. [3]

Textbook reading: Another traditional lecture-style teaching method is assigning a textbook reading to students. The instructor may expect students to read specific chapters or sections of an organic chemistry textbook before coming to class. In class, the instructor then lectures on the topics covered in the textbook. [4]

III. Overview of problem-based learning

Problem-based learning (PBL) is a student-centered teaching approach that involves the use of open-ended, real-world problems to promote deep learning and critical thinking. Here are some key features of PBL:

- Student-centered: PBL is a student-centered approach, in which students take an active role in their own learning. Students work collaboratively in small groups to solve problems, with the instructor serving as a facilitator.
- Real-world problems: PBL involves the use of real-world, open-ended problems that are designed to be complex and challenging. These problems are often based on authentic, real-world situations, and require students to apply their knowledge and skills to find solutions.
- Active learning: PBL promotes active learning, in which students take an active role in their own learning. They work collaboratively to find solutions to problems, and are encouraged to ask questions, explore different perspectives, and reflect on their own learning.
- Integration of knowledge: PBL involves the integration of knowledge from multiple disciplines. Students are expected to draw on knowledge and skills from different areas to solve the problem at hand. [5,6]

Table 2 Advantages and disadvantages of problem-based learning in organic chemistry education:

Advantages	Disadvantages
Promotes deep learning: PBL encourages students to engage in active, self-directed learning, which can lead to a deeper understanding of organic chemistry concepts	Requires significant preparation time: PBL requires careful planning and preparation on the part of the instructor, which can be time-consuming.
Develops critical thinking skills: PBL requires students to apply their knowledge and skills to real-world problems, which can help develop critical thinking and problem-solving skills.	Can be challenging for some students: PBL can be challenging for students who are not used to working in groups or who prefer more structured learning environments.
Enhances collaboration skills: PBL involves working in groups, which can improve communication and collaboration skills.	Difficult to assess: PBL can be difficult to assess, as there may be multiple possible solutions to a problem.

Examples of problem-based learning methods in organic chemistry:

1. Case studies: Case studies are real-world scenarios that are used to explore complex organic chemistry concepts. Students work in groups to analyze the case, identify the key issues, and propose solutions.

2. Inquiry-based learning: Inquiry-based learning involves posing questions and problems to students, and encouraging them to explore possible solutions on their own. In organic chemistry, this might involve conducting experiments or designing molecular models.

3. Project-based learning: Project-based learning involves working on a long-term project that requires students to apply their knowledge and skills to a real-world problem. In organic chemistry, this might involve designing and synthesizing a new compound, or investigating the properties of a known compound. [7]

IV. The research question

Compare the effectiveness of traditional lecture-style teaching versus problem-based learning (PBL) in organic chemistry education. Specifically, the article aims to determine which method is more effective in promoting critical thinking and problem-solving skills in organic chemistry education.

V. Comparison of Traditional Lecture-Style Teaching and Problem-Based Learning

Comparing traditional lecture-style teaching and problem-based learning in organic chemistry education:

1. Student engagement: Problem-based learning typically promotes higher levels of student engagement than traditional lecture-style teaching. PBL involves active participation, collaborative work, and real-world problem-solving, which can increase students' interest and motivation.

2. Learning outcomes: Problem-based learning has been shown to lead to deeper learning and better understanding of complex concepts than traditional lecture-style teaching. PBL encourages critical thinking, inquiry, and reflection, which can result in improved learning outcomes.

3. Retention of knowledge: Studies have shown that problem-based learning can lead to better retention of knowledge and skills than traditional lecture-style teaching. PBL encourages students to apply their knowledge in a practical context, which can reinforce their learning and help them retain information.

V. Conclusion

The article compares traditional lecture-style teaching and problem-based learning in organic chemistry education. It highlights the characteristics, advantages, and disadvantages of each teaching method. Traditional lecture-style teaching is characterized by passive learning, instructor-led lectures, and memorization of information. Problem-based learning, on the other hand, is characterized by active learning, collaborative work, and real-world problem-solving.

The article suggests that problem-based learning has several advantages over traditional lecture-style teaching, including increased student engagement, deeper learning outcomes, and better retention of knowledge. However, it also identifies several challenges and limitations to implementing problem-based learning, such as the time-consuming nature of the method, the lack of structure and guidance, and the need for additional resources.

The potential implications of this comparison for organic chemistry education are significant. It suggests that incorporating problem-based learning methods can enhance students' learning outcomes and retention of knowledge. Therefore, it may be useful for educators to consider incorporating more active learning strategies in their teaching methodologies.

Future research in this area could explore the specific ways in which problem-based learning methods can be applied to organic chemistry education. For example, studies could investigate the impact of problem-based learning on students' problem-solving abilities or the efficacy of specific problem-based learning approaches in teaching organic chemistry. Additionally, research could explore the potential benefits of combining traditional lecture-style teaching with problem-based learning strategies in order to enhance learning outcomes.

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UDC 54

APPLICATION OF GAME TECHNOLOGY IN CHEMISTRY LESSONS

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A number of professional tasks of a teacher include the development of individual abilities and interest in learning, obtaining high-quality knowledge and skills that meet the new demands of society. However, the implementation of the above tasks directly depends on the features of the subject being taught. The subject of chemistry is the nature of matter, while the main approach is the decomposition of matter into simpler components and the synthesis of new substances. In most cases, at the very beginning of the study of chemistry, students associate this subject with interesting and memorable experiments. However in the process of studying chemistry, students face certain difficulties associated with memorizing chemical signs, formulas, reactions, properties of substances and laws. The reason for this is the abstractness of the theoretical understanding of the composition of substances and their occurrence. Thus, the first difficulty lies in the incompetence of teachers to create a direct connection between chemistry and the real world for students as a result of an inefficient way of teaching. The second difficulty in understanding chemistry is related to the limitations of the hours spent on studying chemistry with an overload of topics. For example, according to the order of the Minister of Education and Science of the Republic of Kazakhstan "On approval of standard curricula of primary, basic secondary, general secondary education of the Republic of Kazakhstan", the maximum amount of the academic load on the subject "Chemistry" is:

1) in the 7th grade for 1 hour a week, in the academic year – 36 hours;
2) in the 8th grade for 2 hours a week, in the academic year – 72 hours;
3) in the 9th grade for 2 hours a week, in the academic year – 72 hours. [1]

It can be noted that the intensity of school program forces students to understand complex topics in a short time and thus does not allow creating conditions for the development of cognitive interest in the subject, for the gradual assimilation of complex basic chemical concepts. In order to activate the student's mental activity in the lessons of theoretical training, it is recommended to widely introduce gaming technologies into practice.

It follows from this that it is necessary to make the student an active participant in the educational process, starting at an early stage of studying chemistry. A student can learn information only in his or her own activity if he or she is interested in the subject. Therefore, the teacher needs to be not only in the role of the informant, but at the same time the teacher should play the role of the organizer of the student's cognitive activity.

The use of gaming technologies is a way to diversify the form of the educational process in conditional situations, aimed at the formation of social experience in all meanings: knowledge, skills, abilities, prediction, emotional evaluation, planning, self-regulation. Game programs provide active forms of work aimed at involving students in dynamic activities, ensuring their understanding