



THE USE OF DIDACTIC GAMES AS A MEANS OF INCREASING THE EFFECTIVENESS OF CHEMISTRY EDUCATION

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Abstract

The article presents an algorithm for compiling a didactic game, methodological recommendations for their organization and implementation in the process of teaching chemistry to students of grades 8-9. The effectiveness of systematic and purposeful application of didactic games in teaching secondary school students has been experimentally proven.

Keywords: Teaching chemistry, methodical recommendation, didactic game, application.

ИСПОЛЬЗОВАНИЕ ДИДАКТИЧЕСКИХ ИГР КАК СРЕДСТВА ПОВЫШЕНИЯ ЭФФЕКТИВНОСТИ ОБУЧЕНИЯ ХИМИИ

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Аннотация

В статье приведен, алгоритм составления дидактической игры, методические рекомендации по их организации и проведению в процессе обучения химии учащихся 8-9-х классов. Экспериментально доказана эффективность систематического и целенаправленного применения дидактических игр в обучении учащихся общеобразовательной школы.

Ключевая слова: преподавание химии, методическая рекомендация, дидактическая игра, применение.



KIMYO FANINI O'QITISH SAMARADORLIGINI OSHIRISH VOSITASI SIFATIDA DIDAKTIK O'YINLARDAN FOYDALANISH

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Annotatsiya

Maqolada didaktik o'yinni tuzish algoritmi, ularni kimyoni o'qitish jarayonida 8-9-sinf o'quvchilarini tashkil etish va o'tkazish bo'yicha uslubiy tavsiyalar berilgan. Umumta'lim maktabi o'quvchilarini o'qitishda didaktik o'yinlarni tizimli va maqsadli qo'llash samaradorligi eksperimental ravishda isbotlangan.

Kalit so'zlar: kimyoni o'qitish, uslubiy tavsiya, didaktik o'yin, qo'llash.

Introduction

The current state of development of society and socio-economic transformations in the country make it necessary not only to reform the education system, but also to improve teaching methods, tools and techniques, the results of which, on the one hand, would meet the requirements of society, and, on the other hand, would correspond to the educational needs of students, their inclinations, interests and opportunities.

The increasing volume of information, the continuous replenishment and updating of the content of school subjects, the overload of some new textbooks and programs with theoretical material require students to assimilate an increasing number of theories, laws and concepts. At the same time, numerous observations and studies show that schoolchildren interest in the subjects they study, in particular chemistry, is declining[1].

In this regard, in pedagogy and private teaching methods, the problem arises of developing methods, tools and techniques for a more effective and fruitful educational process, while at the same time preventing overloads of students, which not only cause a negative attitude to learning, but also adversely affect the health of students[2].

In our opinion, this problem can be partially solved by using in the learning process, along with traditional methods and techniques, such a learning tool as a



two-dimensional game. However, if the game is widely used in the educational process of preschool and primary school children and has been studied to a large extent, then the potential of didactic play in the education and upbringing of middle-aged and older schoolchildren has been little studied, and therefore is used sparingly[3].

As our research has shown, the game method in chemistry lessons is used by teachers only occasionally. More often, games are used for extracurricular activities. This is due, in the opinion of the teachers we interviewed, to the lack of a developed system of compilation and application of didactic games in the methodological literature, including: a) an algorithm for compiling didactic games; b) methodological recommendations for their organization and conduct; c) a set of didactic games that correspond to the modern structure and content of school textbooks and programs, allowing the teacher to make the optimal choice of the game depending on the topic and tasks of the lesson[4].

Methods and methodology. The interest in the problem of improving the effectiveness of teaching by means of didactic play is also caused by the contradictions that are inherent in the process of teaching chemistry in secondary schools today[5]:

- between modern psychological and pedagogical teachings and theories of developmental learning and the weak development of methodological foundations for their implementation through school curricula.universities, in particular in chemistry education[6];
- between the need to implement educational tasks and simultaneously increasing the content base of the secondary school chemistry course and reducing the study time to solve them[7].

The above factors determined the relevance of this study and determined the choice of its topic, since, in our opinion, by means of a didactic game, the effect of these contradictions can be weakened, and the effectiveness of learning can be increased[8].

To solve the tasks and perform the work, general scientific research methods were used (questionnaires, analysis, comparison, interviewing, interviewing, study and analysis of scientific and methodological literature), special pedagogical experiment, pedagogical observation and wide approbation of research results in



school practice in the Tashkent region. The mathematical processing of the experimental results and their methodological interpretation are applied[9].

Discussion. The scientific novelty of the work consists in the fact that an algorithm for compiling a didactic game, methodological recommendations for their organization and implementation in the process of teaching chemistry to students of grades 8-9 have been developed and scientifically substantiated. The effectiveness of systematic and purposeful application of didactic games in teaching students of general educational schools has been experimentally proven[10].

The theoretical significance of the work lies in the fact that methodological foundations for the compilation and application of didactic games in chemistry teaching have been created and theoretically substantiated; a conceptual model has been developed, the process of mutual influence of didactic games and learning outcomes has been substantiated; the positive impact of didactic games on the chemistry teaching process of students in grades 8-9 and the development of a student's personality has been proved[11].

The practical significance of the dissertation work lies in the development of a set of didactic games adapted to modern current curricula of basic chemical education. The real possibility of increasing the effectiveness of teaching schoolchildren in ordinary general education schools with the help of didactic games is shown. Certain requirements have been established for the preparation and conduct of didactic srs used in chemistry lessons, and the areas of their application have been considered[12].

The validity and reliability of the research results are ensured by using a wide range of scientific methods corresponding to the research objectives; mathematical processing of experimental data; correspondence of the conclusions obtained during the work with the results of the pedagogical experiment[13].

The developed scientifically based system for the use of didactic games in teaching chemistry in grades 8-9, including an algorithm for compiling, methodological recommendations and a set of didactic games corresponding to the content of the basic school chemistry course[14].

A conceptual model for the application of tactical games in chemistry teaching, based on a theoretical analysis of the general importance of games for a child,



their role in the educational process, taking into account classification, the rhythm of compilation, methodological recommendations for their organization and conduct, in order to develop cognitive interest, motivate students when teaching the subject of chemistry and increase its effectiveness[15].

An integral part of the model is the effective-target component, which allows us to answer the question: "For what purpose is it necessary to apply classical methods in teaching chemistry?". The result! Our research has proved a real increase in the effectiveness of teaching the basic chemistry course by means of a didactic game in combination with other teaching tools used in the lesson. At the same time, didactic games should be closely interrelated with the main content and objectives of the chemistry course being studied, not occupy a predominant place in the educational process, obey the solution of educational tasks of learning and contribute to the development of cognitive interest and the motivational sphere of students.

"The results of improving the effectiveness of teaching chemistry by means of a didactic game" the method of conducting a pedagogical experiment is considered, its results are presented. The main purpose of the pedagogical research was to identify the influence of the system of didactic games on the development of cognitive interest in the subject and the student's personality itself, on changes in educational motivation and on the successful formation of knowledge, skills and abilities of students.

The ascertaining stage made it possible to identify the real state of the use of games in the practical activities of a teacher at school. The survey of teachers made it possible to find out that, in general, there is a positive attitude of teachers towards the use of games in the process of teaching chemistry. However, in practice, teachers include games in the educational process sporadically, since they do not have sufficient methodological training to organize and systematically conduct didactic games in the lessons of the basic chemistry course.

At the stage of the ascertaining experiment, general education classes were selected for the study. One of them was trained using didactic games, and the other was trained using traditional methods. In each class, groups of students with different degrees of learning were selected, namely: group A - high degree of learning; group B - medium degree of learning; group C - low degree of learning.



At the stage of the formative experiment, the following tasks were solved: the influence of the system of application of didactic games on the learning process of the basic chemistry course, the formation of cognitive interest and the motivational sphere of students was studied; test tasks were developed in order to identify the level of acquired knowledge during the period of study in the 8th grade; the impact of didactic games on the result of the reproduced amount of knowledge by students and the quality of their personalities; the mathematical processing of the data obtained in the course of the study was carried out, which allows us to conclude about the effectiveness of the influence of didactic games and the reliability of the results of the pedagogical experiment.

The experimental verification of the effectiveness of the developed methodology for the application of didactic games in the preschool chemistry course was carried out according to the methods of M.V.Matyukhina, Yu.P.Pavlov, A.A.Ksheryalga, A.V.Usova, adapted to the specific tasks of our research.

A study of the leading motives for teaching 8th grade students before and after the experiment showed that if the motives of well-being and avoiding trouble occupied the first place in the experimental class, then at the end of the experiment these motives moved to third place, and in the first place were motives related to duty and responsibility, supported by motives, related to the learning process.

At the same time, cognitive interest in the subject increased by more than 3 times. In the control class, these indicators have not changed much.

The measurement of the amount of knowledge reproduced by the students was determined by Yu.P.Pavlov. The result obtained is the difference in the relative volume of positive reproduction of the meaningful units of the studied section of chemistry of experimental and control classes $d = 1,8$ which allows us to judge the positive impact of the game learning environment and its effectiveness.

At the end of the formative stage of the pedagogical experiment, we conducted a survey of students of the experimental class in order to identify self-assessment of the effectiveness of educational and gaming activities. The obtained data from the student survey showed that the majority of students (more positively relate to the conduct of didactic games in teaching chemistry.



The system of didactic games in teaching chemistry has certain limitations in its use. Numerous observations during the pedagogical experiment have shown that in classes with pronounced student activity in the classroom and a high level of their performance, games of a more competitive nature are of greater interest. In classes with a low level of performance, exercise games are mainly successful, which help students to memorize faster and better assimilate the material being studied. It was also found that didactic scars should be used more often when studying topics that form general chemical concepts (initial concepts, basic classes of inorganic substances, periodic table of chemical elements, etc.), contributing to the assimilation, consolidation, better memorization and systematization of the studied. When studying educational topics of more specific content (chemistry of elements, chemical reaction rate, fundamentals of chemical production, etc.), where previously acquired knowledge is being deepened, conducting didactic games does not give great expected results. The use of story-role-playing games should take place (no more than 1-2 times a year) mainly in senior grades (grades 10-11), since they carry career guidance information in their content, and longer and more time-consuming preparation is required in conducting these games, both from the teacher and from the students.

When explaining new material, the teacher should not get carried away with a large number of didactic games, since the educational significance of the topic, its relevance should not be replaced by gaming, entertaining functions and attributes. As our research has shown, short-term games (5-10 minutes) help to achieve a better and more effective result in the process of teaching chemistry in grades 8-9.

In our opinion, the potential of didactic play can be widely used in the process of conducting propaedeutic chemistry courses, where games will help develop students' interest in chemical science and make the studied material more accessible to them.

Conclusion. A didactic game, by our definition, is a special methodological means of teaching in the form of a steam situation, used by a teacher to arouse interest and achieve certain didactic goals in the educational process.

The mutual influence of the didactic game on the effectiveness of teaching chemistry is shown. a model of the system of application of didactic games in



teaching chemistry has been developed, which reveals the purpose and essence of their use in combination with other means in the educational process.

It has been experimentally shown that the scientifically based use of didactic games in teaching the basic chemistry course allows you to influence the change in the leading motives of learning and the development of cognitive interests in the subject under study, increase the level of learning and the reproduced amount of knowledge, as well as the quality and success of learning, while improving memory and attention.

Improving the effectiveness of teaching chemistry by means of a didactic game can be carried out if didactic games are used purposefully and systematically in the educational process, taking into account their classification, observing a step-by-step algorithm for their compilation and methodological recommendations for organization and conduct, which is confirmed by the results of a pedagogical experiment.

Currently, the study of chemistry at school increasingly begins with propaedeutic courses. Taking into account the results of pedagogical research on the use of didactic games, we believe that the use of games in these courses will also contribute to the development of interest, more successful assimilation of the theoretical foundations of the subject, while avoiding overloads of students.

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