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EFFICIENCY OF USING THE ELECTRONIC PUBLICATION (EP) “SELF-LEARNING” FOR SCHOOL STUDENTS BASED ON COMPUTER TECHNOLOGIES

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Abstract

This article analyzes the effectiveness of using an electronic publication (en) for "self-education" for schoolchildren based on computer technologies. The study highlights the development of students' logical thinking and the consolidation of knowledge through the "self-education" electronic publication (EP) in problem-solving. Problems in traditional teaching methods (time constraints, low motivation) were also studied, and the methodological advantages of using computer technologies and electronic publications (EP) in solving them were substantiated.

Keywords: chemical education, chemical problems, information technology, electronic publication, motivation, logical thinking, classification, teaching methodology.

Introduction

Annotatsiya

Ushbu maqolada kompyuter texnologiyalari asosida maktab o‘quvchilari uchun “o‘z-o‘zini o‘qitish” elektron nashr(en)dan foydalanish samaradorligi tahlil qilinadi. Tadqiqotda masalalar yechish da “o‘z-o‘zini o‘qitish” elektron nashr(EN) orqali o‘quvchilarning mantiqiy tafakkurini rivojlantirish, bilimlarni mustahkamlash masalalari yoritilgan. Shuningdek, an’anaviy o‘qitish

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usullaridagi muammolar (vaqt tanqisligi, motivatsiya pastligi) o‘rganilib, ularni hal etishda kompyuter texnologiyalari va elektron nashrlardan (EN) foydalanishning metodik afzalliklari asoslab berilgan.

Аннотация

В данной статье анализируется эффективность использования электронного издания (en) "самообучение" для школьников на основе компьютерных технологий. В исследовании освещены вопросы развития логического мышления учащихся, закрепления знаний посредством электронного издания (ЭП) "самообучение" при решении задач. Также изучены проблемы традиционных методов обучения (нехватка времени, низкая мотивация) и обоснованы методические преимущества использования компьютерных технологий и электронных изданий (ЭИ) в их решении.

Kalit so‘zlar: kimyo ta’limi, kimyoviy masalalar, axborot texnologiyalari, elektron nashr, motivatsiya, mantiqiy tafakkur, tasniflash, o‘qitish metodikasi.

Ключевые слова: химическое образование, химические задачи, информационные технологии, электронное издание, мотивация, логическое мышление, классификация, методика обучения.

Experimental Sessions and Stages of Their Organization

One of the objectives of the initial stage of the experiment was to determine the influence of working with EN on the emotional sphere of students and their attitude toward learning to solve problems using computer technologies. The identification experiment was conducted in 2021-2022 with the participation of 7th-grade students from general education schools, totaling 307 people. In accordance with the goal set during the experiment, the existing level of

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knowledge and skills in the exact science necessary to solve computational chemical problems related to the main classes of inorganic compounds was determined. [1] During such an examination, the following considerations were noted: In chemistry, the main class of inorganic compounds includes problems related to oxides, acids, bases, and salts:

1. Calculations to find the number of atoms, molecules, and moles in a compound.
2. Calculations using a chemical formula.
3. Calculations for deriving the formula of a compound
4. Determination of skills in solving chemical equations based on appropriate algorithms.

By observing this issue, we determined the mood of the students, solved problems that were easy for them in an interactive way, read the condition, and quickly solved it in interviews, and determined their opinions based on the results of the questionnaire analysis. The problem was that they tried to give a final answer immediately after the first question. They knew that they had to follow all the sequence of actions. In such questionnaires, only positive opinions about EP can be observed among students. This observation led to the hypothesis that when used in teaching typical classroom problems, EP affects weak students more than "strong" students. [2]

Students' attitude toward solving chemical problems using information technology and EP (in the Karakalpak language). 1. I liked the work - 90%. 2. I didn't like working - 3% 3. The idea didn't work - 7%.

Subsequently, this hypothesis was confirmed experimentally. We explain this fact by the fact that when working with EN (in the Karakalpak language), a certain way of thinking is formed in students, and mental actions are ordered. When solving simple typical problems, a strong student does not need to develop such a thinking discipline, as it already exists.

Therefore, he perceives the proposed algorithmic instruction as an assignment of the actions he needs, and naturally acquires experience. He behaves quite

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differently when faced with problems that are unfamiliar or difficult enough for him. In this case, he works with EN more enthusiastically than a weak student. In our opinion, there is great interest in this matter. It should be noted that frontal work can be organized in lessons dedicated to problem-solving, while students perform problems at home during individual work [3.].

Thus, we found that learning with the help of computer technologies is of interest to many users, who love working with EN. After the process of learning to solve problems, students can discuss emotional uplift, individual points of the solution. Working with EN allows for the firm assimilation of knowledge that, under other conditions, does not attract their attention or arouse interest. After this understanding, interest in continuing the work arises. As a rule, a student who has learned to solve one problem feels a sense of satisfaction and takes responsibility for solving the next one.

When interviewing various categories of users, they were asked a very important question for us: "Do you need such a training program?" This issue was of practical importance. During the survey, more than 140 users from the total number of those who have worked with EN answered this question. The responses received are shown in the diagram. More than 95% of those surveyed were in favor of creating an EN. During the experiment, possible directions for applying EN in the educational process were identified. [4.].

EN can be used in frontal work lessons, when students solve problems at home during individual work, in lessons dedicated to problem-solving, and in independent work. We also assumed that he could successfully replace the teacher in their absence. Analysis of the questionnaires confirmed that approximately 46% of users hold the same opinion. Types of independent study can be prepared for entrance exams or a unified state exam. Approximately 35% of users believe that EN can be complete. 18% of users believe that EN can be used for in-depth study of material outside of chemistry lessons, and finally, 58% believe that EN can be used in lessons.

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At the next stage of the experiment, EN was applied to individual-group chemistry lessons in the classroom. Its high effectiveness was confirmed when applied in the educational process and in extracurricular activities.

Users' opinion on the feasibility of creating an EN for teaching solving chemical problems 1. Necessary - 95%. 2. Unnecessary - 1%. 3. The idea didn't work - 4%. The simplicity of control allows a user who has not previously used a computer to quickly master EN. The reference "http://chemical-wine.vercel.app/" is used in EN [5].

Users' opinions on possible areas of application for EN in solving chemistry problems. In class - 58%. 2. For extracurricular work - 18%. 3. In independent work - 42%. 4. Exam preparation - 35%.

Some students who declared their inability to work with a personal computer before the start of academic classes stopped being afraid of the computer and acquired the skills and abilities to work with it while studying chemistry. As an example, I would like to quote a reader's review of EN: "Before I sat down in front of the computer for the first time, I had a special feeling. I was a little worried and a little scared.

"As soon as they showed me how to use a computer, I calmed down." The use of EN in chemistry teaching allows for the implementation of interdisciplinary connections with informatics in practice.

During the study, an analysis of these wishes and proposals was conducted. The purpose of the analysis was to identify proposals for improving the EN that could be implemented in its structure. The comments and suggestions are divided into two groups: those related to the content of the EN and those related to the technical part.

The first group included the following proposals: 1. Provide reference tables of complex inorganic substances. 2. Indicate several methods for solving the problem. 3. Set clear boundaries for rounding fractional numbers. 4. Increasing the size of the EN database. 5. Make the instructions more specific or increase

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the amount of material in them and create several variants. 6. Use test tasks to test students' knowledge where appropriate. 7. Enter more complex tasks into the database. 8. Let it be possible to use the finished solution less frequently. We included the following sentences and remarks in the topics of the second group:
1. The background color is very bright. 2. It is impossible to minimize the program and then return to the solution while performing the action. 3. Allocate space to perform calculations on a computer rather than on paper. Most of the proposals have been implemented in practice, while the remaining proposals will be taken into account when developing new versions of the EN.

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