Volume 3, Issue 5, May - 2025 **ISSN (E):** 2938-3811

Web of Scientists and Scholars: Journal of Multidisciplinary Research

TEACHING CHEMICAL PROBLEM SOLVING AND CLASSIFICATION AS A PEDAGOGICAL PROBLEM

Ajiniyazova Sholpan Saparniyazovna
Assistant, Karakalpak State University named after Berdak
Republic of Uzbekistan, Republic of Karakalpakstan, Nukus

Abstract
This article describes the problems that arise when solving chemistry problems in general secondary schools.

Keywords: Problem, educational issue, chemical thinking, mental activity.

Introduction

The most general definition of a problem is given in the manuals of A. N. Leontiev, according to which a problem is a situation that requires some action from the subject [1]. Thus, the concept of "problem" is determined by activity.

In didactics, the concept of "educational problem" is separately distinguished. D. B. Elkonin [2] formulates a learning problem as a situation that allows the solver to directly master a certain process, method, principle, or "mechanism" of performing any actions of practical importance, and notes the main difference of any other learning problem: its goal and result are not the objects on which the subject of actions acts, but the subject himself. Thus, the concept of an educational problem focuses on the actions that must be performed to solve the problem. The problem itself may not be solved correctly, but the student will gain invaluable experience in solving other problems. In our opinion, taking into account the above, the concept of an educational problem can be defined as follows:

"Educational problems are objects of a student's educational activity, which primarily imply active mental activity aimed at applying general laws in a specific situation." Among educational problems, science problems can be distinguished.

M.V. Zueva gives the following definition of science problems: "Problems are problems that students perform in the implementation of production activities" [3]. G.I. Shtrempleri, A.I., Khokhlova in their methodological manuals give the following definition of a chemical problem: A chemical educational problem is a model of a problematic situation, the solution of which requires students to think and practice based on knowledge of the laws, theories and methods of chemistry, and is aimed at consolidating, expanding knowledge and developing chemical thinking. Solving problems is a form of creative activity, and finding a solution is a process of invention" [4]. Chemical problems are significantly different from the problems that students solve when studying, for example, mathematics or physics. A mathematical problem can be solved without knowing chemistry or physics. Most chemical problems require

knowledge of the material of several disciplines at the same time to solve them, and the idea of the chemistry of the processes taking place is in the first place.

In our opinion, based on the above, we can define the concept of a chemical problem as follows: A chemical problem is an educational problem that requires the student to be able to determine the essence of chemical processes and express them in the form of reaction equations or formulas, taking into account simultaneously occurring processes, and describe the quantitative part of the problem in the form of mathematical operations. In some chemical problems, there is no mathematical part of the solution, but the other two are always present. The above explains to some extent why solving chemical problems is a significant difficulty even for high school students. Primary school students do not first encounter chemistry problems. For the first time, they get acquainted with solving mathematical problems in primary school. Then students get acquainted with physics problems, and only then do they get acquainted with chemistry problems for the first time. Some methods for solving calculation problems are common to mathematics, physics, and chemistry (mathematical operations, notations, names of physical quantities). Students apply the knowledge and skills they have acquired in previous subjects to solve chemical problems. This clearly demonstrates the need for interdisciplinary connections and continuity, especially between chemistry and mathematics and physics.

The most important priority in the study of any educational subject, including chemistry, is not only education, but also the development and improvement of students [5]. Development is a concept that includes various areas of education and upbringing. Mental development is characterized by the ability to perform mental actions, including, as a rule, the ability to learn. As G. M. Chernobelskaya noted, the problem of methodology is to give the teacher specific recommendations on the implementation of the principles of developmental education in the chemistry course ... ", [6]. Development and learning are most effectively carried out in the process of active independent activity of students [7,8,9,10]. Such activities can be organized when solving chemical problems. Currently, chemical problems are turning from a method of developing skills and abilities into a leading teaching method. The student solving the problem is relatively free to choose the solution method, which allows us to talk about creativity and development. At the same time, in the process of solving, he acquires new knowledge, methods of action, and ways of thinking. In teaching students to solve chemical problems, the solution itself is not the goal, it is only a method that helps to deeply understand and master chemical concepts, and serves to develop students' thinking.

According to G. M. Chernobelskaya [6], solving problems helps to generalize theoretical knowledge, and generalization is the highest level of mental activity. Generalization is carried out when connections are sought between the objects being studied, when the search situation is constantly changing. Generalization can be chemical problems that include materials from different subjects or different teaching methods. The most valuable generalization is carried out in the process of independent work. V.I. Daineko also believes: "... the main thing is not that the student can find the right answer to this problem, the goal of teaching chemistry is not formal, knowledge, not the mechanical performance of certain actions and operations, but knowledge and skills based on understanding" [11]. E. A. Shishkin noted that correctly selected

and systematically solved problems create optimal conditions for the formation of creative thinking, a non-standard approach to choosing rational methods of solution [12,13]. Clearly showing the sequence of actions helps to systematize students' mental actions, allows them to analyze and synthesize them in the process of solving, and teaches them to connect with previously studied topics.

It teaches the ability to compare different ways of solving a problem, to see different approaches to solving it, to choose the most rational way of solving it. It is also important to form the skills of correctly designing problem solving. Chemical problems can be used in the educational process in various ways: teaching solutions, solving under the guidance of a teacher, independent work of students, and used in various elements of the lesson. They provide a wide field of activity for the development and upbringing of the individual.

References

1.А. И. Леонтьев. Деятельность. Сознание. Личность. - М.: Политиздат, 1972.-576 с.
2. Д.В.Элконин. Психология обучения младчего школника. М.:Знание, 1974.-64 с.
3. М. В. Зуева Обучение учащихся применению знаний по химии: Кн. Для учителя. - М.: Просвещение, 1987. - 144 с.
4. Штремплер Г. И. Хохлова А. И. Методика решения расчетных задач по химии 8-11 кл.: Пособие для учителя - М.: Просвещение, 2001. - 207 с.
5. Z.K.Qodirov A.G.Muftaxov, Sh.K.Norov Noorganik kimyodan amaliy mashg`ulotlar O`zbekiston respublikasi Oliy va o`rta maxsus ta`lim vazirligi texnik oliy o`quv yurtlarining talabalari uchun o`quv qo`llanma sifatida tavsiya etilgan. Toshkent O`zbekiston 1996.
6. Г. М.Чернобельская Методика обучения химии в средней школе. - М.: Гуман. центр. "Владос", 2000. - 336 с.
7. U.M.Sultanov. Rivojlantiruvchi ta`lim metodologiyasi va texnologiyasi “Ekonomika i socium” №4(95)2022 168-170 b.www.iupr.ru
8. P.I.Ivanov, M.E. Zufarova. Umumiy psixologiya Toshkent-2008 480 b.
9.A.A.Usmanova Pedagogika va psixologiya O`quv qo’llanma Toshkent-2014.302 b
10. М. В. Зуева Развитие учащихся при обучении химии. Пособие для учителей. М.: Просвещение, 1978. -190 с.
11.В.И.Дайнеко Как научить школьников решать задачи по органической химии: Кн. для)учителя. - М.: Просвещение, 1987. - 160 с.
12. Е.А Шишкин. Актуализация обучения решению задач при подготовке учителя химии // Проблемы и перспективы развития химического образования: Материалы Всерос. науч. конф. - 29 сент. - 3 окт. 2003 г. - Челябинск:Изд-во Челяб. гос. пед. ун-та, 2003. - С. 140 - 142.
13.Е. А.Шишкин. Обучение учащихся решению химических задач: Учебно-методическое пособие для студентов химических специальностей педвузов. -Киров.: Изд-во ВГПУ, 2001. - 117 с.