International Journal of Pediatrics and Genetics
Vol. 3 No. 10 (2025)
ISSN: 2995-5483

The Role of Interactive Methods in Organizing Practical Lessons on the Topic "Toxic Effects of Inorganic Elements on the Environment"

Murodova Shaxnoza Ibod qizi
Lecturer, Asia International University

Abstract: This article discusses the organization of a practical training lesson using interactive methods on the topic of pathological conditions arising from the toxic effects of an excess of inorganic elements on the environment and human health.

Introduction. In medical chemistry, classes are generally conducted in the form of lectures, practical exercises, or laboratory sessions. Each class is conducted in a specific format, and organizing practical lessons in cooperation between the teacher and the student through interactive methods significantly increases the effectiveness of the lesson. In the modern educational process, it is crucial to integrate theoretical knowledge with practical training. In particular, the topic "Toxic Effects of Inorganic Elements on the Environment" lies at the intersection of ecology and chemistry, requiring effective use of interactive methods to convey knowledge to students. Interactive methods involve students as active participants, fostering independent thinking, problem analysis, and problem-solving skills.

Main Part

The Significance of the Topic

Studying the harmful effects of inorganic elements helps shape students' ecological thinking, understand the balance between humans and nature, and strengthen their responsibility toward environmental protection.

To ensure that students acquire the necessary skills and achieve deeper mastery of knowledge, the teacher repeatedly reminds them of the concepts through a system of assignments. Organizing the topic "Toxic Effects of Inorganic Elements on the Environment" in an understandable manner using integration methods increases lesson effectiveness. Integrated education ensures multidimensional development of students' worldviews. Since medical chemistry itself is considered an integrative science, the application of this method in practical lessons further enhances learning outcomes. Both internal and external integration are recommended.

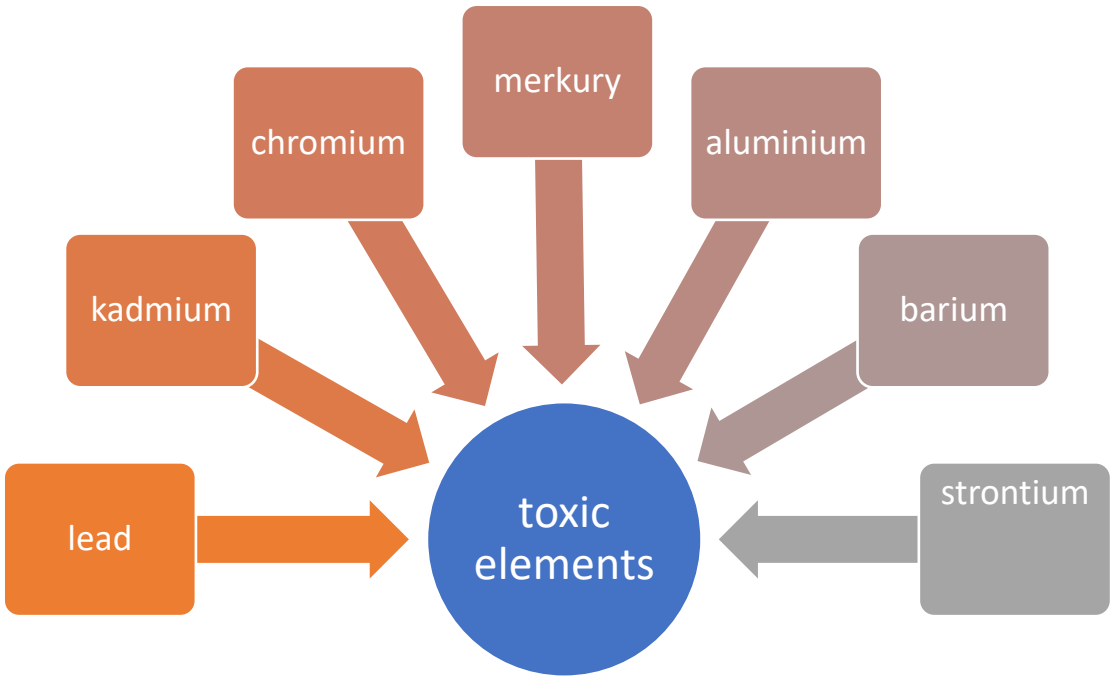
Each historical stage of human development has had a visible impact on the environment. Every civilization has influenced the structure of living organisms, causing either positive or negative changes. Explaining the variations in the concentrations of biogenic and inorganic elements in the human body under the influence of environmental and historical processes illustrates the integration of medical chemistry and history. For example, the tragic consequences of the "Minamata disease" in Japanese history provide students with a clearer understanding of the toxic effects of excess inorganic elements in the body. To reinforce this, students are given handouts describing the causes and consequences of Minamata disease, with ten minutes allocated for individual study. Afterwards, interactive methods such as "rapid question-answer" or "group work" may be applied to consolidate knowledge, making the session more engaging.

Vol. 3 No. 10 (2025)
ISSN: 2995-5483

The "rapid question-answer" method enhances students' attention and responsiveness. Meanwhile, the "group work" method develops their research skills in a competitive environment, encouraging active participation for group success.

Interactive Methods Applied in Practical Sessions:

- "Brainstorming": Students are asked, "Which inorganic elements cause the greatest harm to humans and the environment?" They discuss in groups and draw general conclusions.
- "Cluster Method": A central concept "Toxic Elements" is written, and elements such as lead, cadmium, mercury, chromium, etc. are placed around it, with their sources and effects shown graphically.



- "Role-Playing": Students take roles as "industrialist", "ecologist", "doctor", or "ordinary citizen" to debate the consequences of toxic elements.
- "Case Study": For example, "A mercury-producing plant operates in your region. What threats does it pose to the population and the environment? What measures should be taken to eliminate them?"
- "Blitz Survey" and "Insert" Technology: Students reinforce their knowledge through quick Q&A sessions and analyze texts using the "Know – Want to Know – Learned" strategy.

Examples of Information Table:

Information	I know	I want to know	I studied
Barium sulfate is used as a radiocontrast agent in gastrointestinal radiography.			
Strontium is widely used in the treatment of osteoporosis and as an antitumor agent			
The necessity of			

Vol. 3 No. 10 (2025)
ISSN: 2995-5483

cadmium in the development of living organisms has been demonstrated			
Organic compounds of mercury cause damage to the central nervous system, cardiovascular system, stomach, liver, and kidneys.			

Experimental Results:

Baho darajalari	Practical group	Number of students	Control group		Experimental group	
			Number	%	Number	%
Excellent			12	50	13	53
Good		24	8	33	8	33
Satisfactory			4	17	3	14

References:

1. G.A. Ixtiyarova, D.J. Bekchanov, M.Sh.Ahadov. “The Importance of Modern Technologies in Teaching Chemistry.” (Textbook), Tashkent, 2020.
2. Murodova Sh.I. “Utilizing Pedagogical Mastery in Organizing the Lecture on ‘Introduction to Medical Chemistry’” (4) 2025.
3. R. Mavlonova, D. Abdurahimova. “Pedagogical Mastery.” (Textbook), Tashkent, “Science and Technology,” 2009, p.176.
4. B.L. Faberman et al. “Modern Teaching Methods in Higher Education.” Tashkent, 2002.
5. A. Efimova. “The Teaching Profession.” Tashkent, 2002.
6. N.T. Alimkhodjayeva, G.G. Suleymanova, Z.A. Ikramova, X.S. Tadjiyeva. “Medical Chemistry, Part 1.” Tashkent, 2024.