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Research Article

DEVELOPINF OF 21ST CENTURY SKILLS AMONG STUDENTS THROUGH THE ENHANCEMENT OF THE CHEMISTRY CURRICULUM

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ABSTRACT

The article covers textbooks created on chemistry of the 7th and 10th grades on the basis of the "National Curriculum", their content and developing competences.

KEYWORDS

"National curriculum", base competencies, subject competencies, practical training, project work.

INTRODUCTION

In developed countries, education is recognized as a key factor in ensuring sustainable development, and in the new educational concept established by international organizations and most countries of the world until 2030, the urgent task was "to improve the process and means of assessing the quality of education, to introduce into practice mechanisms that allow you to determine the results achieved." Of urgent importance is the introduction of state educational standards based on a competency approach to the educational system, the development of a system of criteria, indicators, parameters and indicators of the quality of training, the identification of factors affecting the quality of training.

Methodology. In general secondary schools, the interests of 7th and 10th graders in mastering and learning in skills-based education were studied. In this case, one school was selected from 14 regions of the Republic. Respondents were observed in cooperation with science teachers to master the academic year 2022-2023 and the academic year 2023-2024 during September-February. Analysis, synthesis, observation, survey methods were used as research methods.

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By improving the quality of teaching natural scientific disciplines in the World, effective research works are being carried out aimed at creating a modern methodological framework for the development of mental potential, creative abilities of students and ensuring the quality of Education.

In the 21st century, at the International Council of Europe for education, J. Delor. In his lecture," education is a hidden treasure", he explains" the four pillars on which education rests": learning to know, to do, to learn to live together, to learn to live. These concepts reveal the main content of competence.

According to the decree of the president of the Republic of Uzbekistan "on additional measures to further improve the educational system" dated November 6, 2020 PQ-4884, the order of the minister of public education "on approval and experimental testing of the preliminary draft of the national curriculum of general Secondary Education "dated December 9, 2020 " ensuring continuity and continuity of educational programs and disciplines of preschool, general secondary, secondary

In education, a competency-based approach suggests the formation of general educational skills in schoolchildren, which means the transition from private skills and subject-specific skills, information as the subject of memory to the school of thinking, acting and developing abilities.

On the basis of the national curriculum, graduates of the school develop scientific literacy competencies and practical competencies in chemistry. In the lessons, competencies related to the main subject sub competences are developed on the basis of topics. Sub competences are encoded, and are important in evaluating results. For example, scientific literacy competence SLC, with corresponding sub competences SLC 1, SLC 2 defined.

Scientific literacy competence includes 6 sub competences: SLC 1. Understanding chemical concepts and terms, SLC 2.Determination of the essence of the process, theoretical law and laws on chemistry , SLC 3.The use of chemical formulas and units, SLC 4.Separation of similarities and differences between chemical and other science phenomena, scientific interpretation of various information (formula, graph, table) on SLC5 , SLC 6.Distinguish between classical and modern chemical teachings.

Subcomponents covered by practical competence: PC 1. To follow the rules for the use of chemicals and equipment; to perform laboratory experiments based on the subjects studied; PC 2. Chemical formulas, the use in practice of theoretical laws and laws on chemistry, the performance of actions on their basis; PC 3. Solving questions about chemistry; PC 4. Conducting experiments and research, drawing conclusions, analyzing, describing the results in different ways;

PC. Chemical and other science to observe processes related to phenomena, conduct experiments and research, draw conclusions, analyze, describe results in different ways; practical competence6. Making models that explain the vital importance of experiments.

Results and discussion.

21st century education is a term associated with students ' adaptability to life when faced with real - life challenges .

Essential skills are required to achieve success in 21st century life and the workplace: for example, Information, media and technological skills, communication and collaboration skills, critical thinking and problem-solving skills. . The fact that school education educates students with 21st century skills contributes to an effective society .

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In the general system of secondary education, students are prescribed the formation of base competencies in combination with competencies related to science. Through the disciplines in the direction of the block of natural and Economic Sciences, it is advisable that the formation of base competencies in students is aimed at being able to apply the skills and qualifications acquired on the basis of the knowledge acquired by them in various situations.

In particular, in the formation of communicative competencies, it is necessary to correctly pronounce, interpret and teach free communication terms related to natural and Economic Sciences in the formation of the skills of independent, creative thinking, written and oral fluency in mastering the state language, foreign languages.

In the teaching of subjects, it is necessary to regularly use modern information and telecommunications tools that expand the possibilities of effective development of competence in working with information. In this case, it is recommended to use mobile devices (phones, tablets and other gadgets) in the formation of skills for students to search for information related to science from various sources, analyze it and work with the media in compliance with information security.

In the formation of self-development competence, it is necessary to have universal qualities, love the motherland, acquire legal, economic knowledge, strive for innovations and, on the basis of acquired theoretical knowledge, to make independent decisions, be aware of progressive and innovative changes in society and be able to use them in everyday life.

Civic duty in the formation of socio-emotional and civic competence consists in acquiring knowledge about social and political development, emergencies, environmental problems and understanding artistic and artistic works and developing organizational feelings in their preservation.

The formation and development of competencies related to the base and science in students allows them to develop a scientific worldview, the ability to think logically, the potential for self-realization, raise chemistry to a new qualitative stage of teaching, connect the content of Science in the educational process with the development of current social life, science and technology and modern technologies.

Education based on a competency approach consists in strengthening the practical nature of the subjects. This orientation comes from simple questions about how a student can use the results of the knowledge they have acquired in school outside of school. The main idea of this approach is that everything studied must be included in the process of use in the life of the individual in order to ensure the “long-term impact” of school education. This is especially true of theoretical knowledge, which should cease to be a burden that is simply memorized and become an explanation of phenomena and a practical tool for practical situations and problem solving.

The main goal is not to master the sum of data, but to develop skills that allow students to identify their goals, make decisions and act in normal and non-standard situations. It is in this direction that special attention is paid in the textbooks of the 7th and 10th grades. For example, consider practical competencies.

AK1. Following the rules for the use of chemicals and equipment; sub competition of performing laboratory experiments based on the subjects studied in Grade 7 p.122 “chapter V. Theme 5. Obtaining and properties of acids"; Grade 10 p.167 “ Chapter III. Theme 21. Practical training. Experiments on carbohydrates " topics;

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AK2. Chemical formulas, the use of theoretical laws and laws on chemistry in practice, the sub competition of performing actions on the basis of them Class 7 p.100 "Chapter IV. Theme 7. Flame structure and combustion of substances in oxygen"; Grade 10 p.173 "Chapter III. Theme 23. Practical training. Identification of organic compounds on the basis of specific reactions " topics;

AK3. The sub competition of solving problems of chemistry in Grade 7, p.37 "Chapter II. Theme 11. Solving problems related to calculation based on chemical formulas";

AK4. Conducting experiments and research, drawing conclusions, analyzing, describing the results in different ways sub competition in Grade 7 p.31 "Chapter I. Theme 9. Observation and description of the chemical processes taking place in everyday life, in the farm"; Grade 10 p.37 "Chapter I. Theme 10. Practical training. Analysis of the composition of organic compounds";

AK5. Chemical and other science monitoring processes related to phenomena, conducting experiments and research, drawing conclusions, analyzing, describing results in different ways sub competence in Grade 7 p.135 "Chapter VI. Theme 3.. Physical properties of water"; Grade 10 p.155 "Chapter III. Theme 17. Practical training. On the topics" getting soap from oils";

AK6. Making models explaining the vital importance of experiments subcompetence Grade 7 p.173 "Chapter VIII. Theme 4. Practical training. Reducing ecological footprint"; Grade 10 p.189 "Chapter IV. Theme 3. Practical training. An example is the development of paper processing".

Based on the goals and objectives of the national curriculum, the goals of Sustainable Development, A global Call of the United Nations to improve the way of life and improve the well-being of all mankind by comprehensively improving the economic, social and environmental situation in the world, to build a fair and sustainable society, are embedded in the content of chemistry textbooks. Since the experience of different countries in the field of sustainable development varies greatly, all the goals and relevant tasks of the Agenda 2030 are formulated in a general, universal form. Each country is set to localize BRM, i.e. develop national development goals based on its development priority and financial capabilities, out of 169 tasks on the agenda for 2030. It is envisaged that countries will adapt these goals to their national conditions.

From the goals of Sustainable Development in the 7th and 10th grade chemistry textbook on the basis of the national curriculum:

"Goal 7: to ensure the possibility of using cheap, reliable, stable and modern sources of energy for all;

Objective 11: to ensure the openness, safety, robustness and environmental sustainability of urban and residential areas;

Goal 12: ensure reasonable consumption and transition to production models;

Goal 13: the formation of knowledge and skills related to "quick action to combat climate change and its consequences" is embedded in a number of topics:

In Grade 7: Chapter IV. Theme 2. Factors affecting air pollution. P. 87.

Chapter IV. Theme 6. Burn. P. 97.

Chapter IV. Theme 8. Ozone and its use. P. 102.

Chapter IV. Theme 9. The biological importance of oxygen and ozone. P. 104.

Chapter V. Theme 7. Acid rain. P. 126.

Chapter VI. Theme 7. Water pollution and methods of its purification. P. 144.

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Chapter VIII. Theme 2. Minerals and deposits in Uzbekistan. P. 176.

Chapter VIII. Theme 3. Ecological aspects in the production of minerals. P. 170.

Chapter VIII. Theme 4. Practical training. Reducing environmental footprint. P. 173.

In Grade 10: Chapter II. Theme 8. Obtaining, properties and uses of alkenes. P. 59.

Chapter II. Theme 19. Oil and oil processing. P. 88.

Chapter II. Theme 22. Natural sources of hydrocarbons, the effective use of their processing products. P. 96.

Chapter III. Theme 15. Practical training. Complex esters in plants. P. 150.

Chapter III. Theme 22. Natural and artificial fibers. P. 169.

Chapter IV. "Environmental Protection".

Chapter IV. Theme 2. Organic waste and their processing technologies. P. 185.

Chapter IV. Theme 3. Practical training. Paper processing. P. 189.

In the curriculum, the content of activities of education is reflected in the emphasis on the methods, skills of activities that must be formulated, the experience of activities that must be collected and understood by students, and the educational achievements that students must demonstrate.

The most important sign of a competency-based approach is the student's ability to learn independently in the future, and this is impossible without deep knowledge. However, the role of knowledge has changed. Knowledge is now completely subject to skills. The content of education includes only the knowledge necessary for the formation of skills. All other knowledge is treated as a reference, which is stored not in the head of the reader, but in reference books, encyclopedias, on the Internet. At the same time, the reader should be able to quickly and accurately use all sources of this information to solve certain problems, if necessary.

To achieve the educational goal, the composition, content of the teacher's training sessions – what should be changed in the formation of students ' competencies?

To solve learning problems, it is important to activate mental activity and create an effective model of the development of learning techniques.

How important it is for a child to be on the path from simple memorization to knowledge, from incompetence to skill, to know the meaning and outcome of his actions, thus having competencies. Only the knowledge that the student himself strives for and understands becomes solid and conscious.

In the formation of communicative competencies, the state language, independent, creative thinking in mastering foreign languages, correct pronunciation, interpretation of terms related to natural and Economic Sciences in the formation of written and oral fluency, and teaching free communication, for example, in Chapter II “simple and complex substances”, experiments on “determination of water added to milk” and “determination of butter quality”, which can be used in 2 As a result of the conclusion, it will be easy to understand that the quality of substances depends on their composition. Comprehensible interpretation of one's own opinion, correct pronunciation of terms related to chemistry have a positive effect on the level of study of the subject. As such, in a practical exercise on the topic of Chapter VII “determining the composition of apples”, skills related to quality analysis are also developed. Chapter IV on the topic” the biological importance of

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oxygen and ozone " is a comparison of two important substances, with examples of the fact that it is important to know their importance.

In the teaching of chemistry, it is necessary to regularly use modern information and telecommunications tools that expand the possibilities of effective development of competence in working with information. In this case, it is recommended that students use mobile devices (phones, tablets and other gadgets) to search for information related to science from various sources, analyze it and formulate skills for working with the media in compliance with information security. For the formation and development of this competence, the house was given project work for the task.

For example, in Chapter I, “practical training. Project work named t” observe chemical phenomena that occur in the Garden, collect data and present it to the next lesson “on the topic” observation and description of chemical processes taking place in everyday life, in the farm;

Chapter V “strengthening lesson” on the topic " Do You know the natural indicators? Where and how can they be used? "project work;

Chapter VI. On the topic” water pollution and methods of its purification " water

preparation of a draft proposal on pollution and methods of its purification”;

"Chapter VII. Project work on the topic” chemical elements in living organisms and their importance “entitled” collecting data on the occurrence and importance of certain minerals and chemical elements in the composition of nutrients;

Chapter VII. "Practical training. Determination of the composition of apples” was given a project work on the topic " vitamins and minerals in fruits or vegetables."

Effectiveness of the formation of competencies in students (at the beginning and at the end of the experiment)

Groups	Number of students	Reproductive degree	Partial algoritmic degree	Partial research degree	Independent investigation degree
Main competences					
Experiment group	at the beginning	782	243	328	152	59
	At the end	782	75	352	208	147
Control group	at the beginning	780	241	325	154	60
	At the end	780	238	324	152	66

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Competences related to science						
Experiment group	at the beginning	782	211	345	172	54
	At the end	782	76	321	242	143
Control group	at the beginning	780	190	346	182	62
	At the end	780	190	346	182	62

CONCLUSION

So, the content of chemistry textbooks of grades 7-10 based on the competency approach includes:

1. Since the concept of chemistry is an integral part of the only natural-scientific image of the world, the science of chemistry is a central Natural Science, closely related to other natural sciences.
2. There is a connection between the fact that the surrounding world consists of substances that are characterized by a certain structure and are capable of mutual changes, the structure, properties and application of substances.
3. Chemical thinking, the ability to analyze the phenomena of the surrounding world from a chemical point of view, the ability to speak and think in a chemical language.
4. Understanding the role of chemistry in everyday life and its practical importance in the life of society, as well as understanding the place of humanity in solving food, Energy, Environmental, Defense, etc., which are global problems.
5. In everyday life and practice, safe handling skills with substances, materials and chemical processes include knowledge, skills and competencies such as chemical process management.

In this case, the enrichment of the educational process is required to organize the educational process on the basis of innovative technologies. A competency approach leads to a change in understanding of educational goals, to an understanding of the need for other educational methods or technologies such as activity, group, game, role, practice-oriented, problematic, necessitating the use of modern teaching methods. Helps students see the connection between individual subjects, school activities and the outside world.

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