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METHODOLOGY FOR ASSESSING FUNCTIONAL LITERACY OF STUDENTS IN THE PROCESS OF TEACHING CHEMISTRY

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Abstract
The article highlights the most important components of functional literacy, the quality of education, assessment of students' functional literacy at the international level, assessment of students' functional literacy and competence, assessment of students' functional literacy in the course of chemical education, assessment of the effectiveness of existing teaching methods, the concept of assessing students' functional literacy in the process of teaching chemistry, assessment methods, as well as approaches to the methodological component.

Keywords: Functional literacy.

Introduction

The modern era of the development of the education system has clearly defined new priorities in the field of school education, corresponding to global trends. A number of schools in the republic have developed a number of priority measures to ensure the quality of education:
indicators characterizing the level of education of students and the justification of the effectiveness of education;
development of objective assessment procedures and technologies to ensure reliable and comparable information;
creation of an education quality monitoring system, including an extensive regional network;
training, retraining and advanced training of personnel for the education quality management system.
Meeting these requirements, the school system is moving into a mode of continuous modernization of the goals, principles, content and technologies of the educational process [1].

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In the context of the development of a national system for assessing the quality of general education in our republic and the beginning of work on the introduction of 4th generation educational standards, a rethink of the approach to assessing the quality of educational outcomes is inevitable. The new paradigm may be based on the well-known "quality cycle" in qualitology, which includes the following links:

1. Marketing in an educational environment. In the context of the development of a national system for assessing the quality of secondary school education in our republic and the beginning of work on the introduction of educational standards of the 4th generation, a rethink of the approach to assessing the quality of educational outcomes is inevitable. The new paradigm may be based on the well-known "quality cycle" in qualitology, which includes the following links:
1. Marketing in an educational environment.
2. Designing requirements for graduates of educational institutions based on state standards.
3. Development of the content and technology of student education in educational institutions.
4. Logistical, scientific and methodological support of the educational process.
5. Introduction of educational technologies.
6. Monitoring the quality of students' education according to certain indicators.3. Development of the content and technology of student education in educational institutions.
4. Logistical, scientific and methodological support of the educational process.
5. Introduction of educational technologies.
6. Monitoring the quality of students' education according to certain indicators [2].

The implementation of this cycle requires the development of monitoring models for assessing the quality of education at various levels, since there is no doubt that education quality management depends primarily on the quality (objectivity) of the methodology for evaluating its results [3].

The relevance of the problem of assessing the quality of education is clearly demonstrated by research conducted in the domestic and foreign theory and practice of education. Thus, in recent years, much attention has been paid to such issues as the disclosure of the essence of the concept of quality of education by domestic and foreign scientists (V.punctuality, punctuality, punctuality, problems

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of assessing the quality of education, individual problems of assessing the quality of education, punctuality, punctuality, problems of universality, problems of assessing the quality of education are clearly demonstrated by research conducted in domestic and foreign theory and practice of education. Thus, in recent years, much attention has been paid to such issues as the disclosure of the essence of the concept of quality of education by domestic and foreign scientists (V. P. Bespalko, G. A. Bordovsky, B. G. Gershunsky, V. P. Panasyuk, M. M. Potashnik, N. A. Selezneva, etc.), pedagogical qualimetry (V. P. Bespalko, A. I. Su-Betto et al.), the quality of students' knowledge and skills (E. A. Krasnovsky, T. L. Kogan and Y. Lerner, M. N. Skatkin et al.), a level-based approach to student learning (O.kakatkin drkatkin et al.), etc.), a level-based approach to student learning (O. E. Lebedev Katkin et al., leveled Katkin et al.a level-based approach to student learning), a level-based approach to learning Katkin et al.), Katkin et al., a level-based approach to student learning (O. E. Lebedev, L. M. Perminova, A. P. Tryapitsina et al.), monitoring and diagnostics of the quality of education (B. P. Bitinas, V. V. Guzeev, I. Y. Gutnik, V. A. Kalni, V. N. Maksimova, A. N. Mayorov, S. E. Shishov, A. P. Tryapitsina, etc.), assessment of student performance (V. M. Blinov, V. Pisarev, V. M. Polonsky, A. N. Mayorov, etc.), competence approach (I. Y. Aleksashina, O. V. Akulova, V. A. Kalni, S. P. Pisareva, S. B. Shishov, and others). Most of the work was carried out by foreign researchers (K. Ingenkamp, I. Costa, R. Wohlseller, D. Nixon, G. Cavelty, M. Holt, and others).

Unfortunately, pedagogical and didactic-methodological monitoring and diagnostic studies to assess the quality of education are rare, and therefore many issues have not been sufficiently studied [4].

The central issues of the methodology for assessing the quality of school education are, firstly, the definition of what should be evaluated (problems of the quality of learning outcomes, educational standards, the level of student training, requirements for the quality of graduate training) and, secondly, how the assessment should be conducted (stages, principles, forms, methods, evaluation tools).

In recent years, the problem of the quality of chemical education has become central to the theory and methodology of chemistry teaching due to the real decline in the quality of the school chemical education process. A paper has been published to assess the quality of training for graduates of secondary schools, containing a mandatory minimum of educational content, requirements for the

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level of training for graduates of secondary schools (A. In recent years, the problem of the quality of chemical education in recent years, the problem of the quality of chemical education has become central to the theory and methodology of chemistry teaching due to the real decline in the quality of the school chemical education process. A paper on the assessment of the quality of basic school graduates' training has been published, containing a mandatory minimum of educational content, requirements for the level of training of basic school graduates (A. A. Kaverina, S. V. Suma-toksin). On the problems of chemical literacy of students (A. A. Tildsepp et al.), towards a step-by-step approach to the acquisition of knowledge and skills (N. E. Kuznetsova, M. S. Park, I. M. Titova, G. I. Yakusheva et al.), the development and improvement of tasks for measuring the level of readiness of students (M. V. Zueva, E. G. Zlotnikov, N. N. Gara, P. A. Gloriozov, A. A. Kaverina, D. M. Kiryushkin, N. N. Lagutina, etc.), component and operational methods of analysis (V. I. Rostovtseva, B. JI. Russ et al.) and others have developed a methodology for an integrative approach in teaching chemistry (M. S. Pak) [5].

It serves as a prerequisite for the development and implementation of a methodology for assessing students' functional literacy in chemistry. However, its creation and application in chemistry teaching were not fully realized due to a number of unresolved theoretical and methodological issues, namely:

1. The lack of a unified conceptual framework on the problem of evaluating the Federal State University of Chemistry.

2.I am developing and implementing methods of functional literacy of students in chemistry. However, its creation and application in chemistry teaching were not fully realized due to a number of unresolved theoretical and methodological issues, namely:

1. The lack of a unified conceptual framework on the problem of assessing the Federal State University of Chemistry.

2. The underdevelopment of the theoretical and methodological foundations and the theoretical assessment model of the Federal State University of Chemistry.

3. The scientific groundlessness of the leading goals and evaluation functions of the Federal State University of Chemistry.

4. The uncertainty of the structure and content of functional literacy in chemistry.

5. The lack of a generally accepted methodology for assessing the level of knowledge of students in the process of teaching chemistry.

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6. The lack of modern forms, methods and means of assessing students' knowledge of chemistry [6].

The results of the analysis of the state of the problem of assessing the quality of the result of the chemical educational process clearly show the need to create a modern theory and methodology for evaluating students of higher educational institutions in chemistry:

these are the new socio-cultural conditions of our society, the crisis of previous systems of values and priorities of chemical education, the transition of the education system to progressive models and technologies, technologies for assessing the quality of natural science teaching [7].

The relevance of our research lies in the fact that the development of the problem of assessing students' functional literacy in chemistry is connected not only with scientific (disclosure of the content and structure of the State University of chemistry, disclosure of methodological and theoretical foundations of its assessment in the process of teaching chemistry in secondary schools), but also with the formation of a socially chemically educated, functionally literate personality, It is also of practical importance. It is related to the development and implementation of a theoretical model and methodology for assessing students' functional literacy in chemistry.

The research is related to the need to resolve the following main contradictions:

between the modern requirements of the state, society, family, personality, educational institutions, and social structures for the quality of chemical education in basic schools and the limitations of the methods and technologies used to assess the quality of its results;

the difference between the need to ensure the quality of chemistry education in secondary schools and the lack of a holistic methodology for its objective and comprehensive assessment;

Chemistry in primary school is between the traditional methodology for assessing the quality of educational outcomes and the need to introduce a step-by-step methodology for assessing the quality of students' functional literacy in chemistry.the difference between the need to ensure the quality of chemistry education in secondary schools and the lack of a holistic methodology for its objective and comprehensive assessment;

Chemistry in primary school is between the traditional methodology for assessing the quality of educational outcomes and the need to introduce a step-by-step

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methodology for assessing the quality of students' functional literacy in chemistry [8].

The relevance, incompleteness and unresolved nature of the above-mentioned scientific tasks and contradictions in the theory and methodology of chemistry teaching led to the choice of the research topic.

The aim of the research is to develop and implement a methodology for assessing the functional literacy of chemistry students, ensuring a stable quality of chemistry teaching in secondary schools.

The object of the research is the process of assessing the functional literacy of students in chemistry in secondary school.

The subject of the research is the structure and content of functional literacy of chemistry students.The aim of the research is to develop and implement a methodology for assessing the functional literacy of chemistry students, ensuring a stable quality of chemistry teaching in secondary schools.

The object of the research is the process of assessing the functional literacy of students in chemistry in secondary school [8].

The subject of the research is the structure and content of functional literacy of chemistry students.

The hypothesis was put forward in accordance with the purpose and subject of the study.

The quality of chemistry assessment and teaching in secondary schools is ensured if the assessment of students' functional literacy in chemistry based on the principles of objectivity, integration, substantive reliability, continuity and complexity is carried out in integrity at the stages of diagnosis, monitoring and certification.

To achieve the goal and test the working hypothesis, the following tasks were set:

1. The quality of chemistry assessment and teaching in secondary schools is ensured if the assessment of students' functional literacy in chemistry based on the principles of objectivity, integration, substantive reliability, continuity and complexity is carried out in integrity at the stages of diagnosis, monitoring and certification [4].

To achieve the goal and test the working hypothesis, the following tasks were set:

1. Information search and analysis of philosophical, psychological, pedagogical, didactic and methodological literary sources on the problem of assessing students' functional literacy in the learning process.

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2. Define the conceptual framework for the research topic.
3. Scientific substantiation and formation of theoretical and methodological foundations of the methodology for assessing functional literacy of students in the process of teaching chemistry.
4. To determine the structure and content of the Federal State University of Chemistry, corresponding to the modern educational standard in chemistry.
5.. Define the conceptual framework for the research topic.
3. Scientific substantiation and formation of theoretical and methodological foundations of the methodology for assessing functional literacy of students in the process of teaching chemistry.
4. To determine the structure and content of the Federal State University of Chemistry, corresponding to the modern educational standard in chemistry.
5. Development of a theoretical model and methodology for assessing functional literacy of students in the process of teaching chemistry based on it.
6. To determine the methodological prerequisites for the optimal functioning of the developed assessment methodology of the Federal State University of Chemistry.
7. To conduct an experimental test of the effectiveness of the proposed methodology for assessing functional literacy of students in the process of teaching chemistry [6].
To solve the tasks set, the following research methods were used:
analysis and synthesis of philosophical, psychological, pedagogical and methodological literature on the research problem, study, modeling and construction of normative documents, generalization, comparison;
questionnaire, interview, observation, pedagogical experience, written control work, inter-element and operational analysis, determination of the quality and quantity of respondents' responses, graphical and tabular presentation of the results, methodological interpretation of the results.
The scientific novelty of the research lies in the fact that for the first time in the theory and methodology of chemical education, a step-by-step methodology for assessing the functional literacy of chemistry students in secondary schools in the context of a competence-based approach was developed [8].
The theoretical significance lies in the fact that:

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The necessity of modernizing the methodology for assessing the quality of chemical education results in secondary schools and creating a modern methodology for evaluating FGU chemistry is substantiated.;
The main contradictions have been identified, the solution of which will help to formulate a new relevant scientific problem and solve it.;
The methodological and theoretical foundations of the methodology for assessing the functional literacy of university students in chemistry are defined: methodological approaches (competence-based, functional-non-activity, complex), leading ideas (Modernization of education, standardization, humanization) and principles (integration, meaningful authenticity, continuity);
the conceptual framework of the system for assessing the quality of chemical education in secondary schools has been improved and expanded, which is necessary for optimal use of the author's assessment methodology, which includes the following concepts: quality of education, literacy, level of education, functional literacy of students, functional literacy of students in chemistry, assessment of functional literacy of students in chemistry, the purpose of assessment in chemistry of BSU;
The priority functions (diagnostics, monitoring, certification) of assessing students' functional literacy in chemistry are determined, which serve as the initial condition for creating the content and methodology for assessing students' functional literacy in the process of teaching chemistry in secondary schools.;
The composition and structure of students' functional literacy in chemistry are determined, which corresponds to the modern educational standard in basic school chemistry and includes 4 main components: basic unchangeable knowledge, subject skills of a reproductive and productive and creative nature, students' value relations to chemical and other objects.;
An author's model for assessing students' functional literacy in chemistry has been developed, on the basis of which a step-by-step methodology has been built and tested that implements the initial variants of Express, systemic and complex assessment methods at the stages of diagnosis, monitoring and certification during the current, intermediate and final assessment. functional literacy of chemistry students.
The practical significance lies in the fact that:
The quality of functional literacy of students in chemistry is a certain level of assimilation by students of the content of teaching basic school chemistry,

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corresponding to the modern standard. Let's identify four levels of functional literacy of chemistry students: unacceptable, acceptable, sufficient, high-quality chemical education is the external and internal accuracy of the process and result of chemical education, reflecting the compliance of the current educational standard in chemistry achieved by students. Monitoring of students' functional literacy in chemistry is a systematic, continuous monitoring of the quality of students' functional literacy at the intermediate stage of the lesson and the chemical education process as a whole. Assessment of students' functional literacy in chemistry is the process of determining whether the level (quality) of functional literacy achieved by students corresponds to the educational standard of the basic school in chemistry. assessment of the quality of functional literacy of students is the result of the expression of value relations of subjects of chemical sciences. Educational process the quality of knowledge, skills and abilities of students and the nature of their value relationships [8]

Functional literacy of students is a certain level of knowledge of secondary school students, representing the level of mastery of their core competencies, allowing them to effectively navigate in educational activities and beyond. functional literacy of students in chemistry is a certain level of knowledge of secondary school students, characterized by the level of mastery of their core competencies, determined by the educational standard for chemistry of secondary schools, in order to navigate in educational activities and beyond [9].

Conclusion

1. As a result of the conducted theoretical and experimental studies, it has been established that at present, due to a fundamental change in socio-economic conditions, the formation of a functionally literate student's personality is becoming an urgent task of basic general secondary education and chemical education in particular.

2. The need to apply a comprehensive assessment methodology for the Federal State University of Chemistry is due to the need to eliminate the contradictions we have identified:

a) modern requirements of the state, society, family, personality, educational institutions, and social structures for the quality of chemical education in secondary schools and the limited methods and technologies used to assess the quality of its results;

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b) the need to ensure the quality of basic school chemistry education and the lack of a holistic methodology for its objective and comprehensive assessment;
C) between the traditional methodology for assessing the quality of the results of the chemical education process in secondary schools and the need to introduce modern methods for assessing the quality of functional literacy of students in chemistry.
3. Taking into account the federal educational standard, methodological, theoretical and didactic-methodological conditions, the content and structure of the Federal State University of Chemistry have been developed, representing the unity of the following 4 interrelated components: basic unchangeable knowledge, subject skills of a reproductive nature, objective skills of a productive and creative nature, value relations to chemistry and other subjects.
4. The conceptual provisions are formulated and a theoretical model of the FSU chemistry assessment is developed, reflecting the integrity of the target, meaningful, organizational, methodological and effective components.
5. The conceptual rules and the theoretical model of functional literacy assessment served as the basis for the development of a comprehensive step-by-step assessment methodology for the Federal State University of Chemistry, which includes the stages of diagnosis, monitoring, certification and implements optimal assessment methods and tools in the process of ongoing, interim and final assessment.
6. Within the framework of the research, measuring and evaluation materials (graphical schemes of concepts, express, system and complex tasks, written control papers) were developed and applied, the quality requirements for chemical knowledge and subject skills in the chemistry course of grades 8-9 were determined, the possibilities of diagnosis, control and certification were determined. Within the framework of the research, measuring and evaluation materials (graphical schemes of concepts, express, system and complex tasks, written control papers) were developed and applied, the requirements for the quality of chemical knowledge and subject skills in the chemistry course of grades 8-9 were determined, the possibilities of diagnosis, control and certification were determined. functional quality (degree) allows an objective assessment of chemical literacy of students, which, in turn, ensures the quality of students' professional qualifications in chemistry.

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7. Methodological prerequisites have been identified that contribute to the optimal functioning of the proposed methodology for assessing students' functional literacy in chemistry, as well as ensuring objective and high-quality learning outcomes in chemistry.
8. The analysis of the results of the pedagogical experiment showed that the methodology for assessing students' functional literacy in chemistry provides objectivity, integrativity, meaningful reliability, continuity and comprehensive assessment in the process of conducting current, intermediate and certification, as well as basic chemical concepts, objective skills (intellectual, communicative, chemical experimental, computational and computational, symbolic andgraphic) and students' value attitudes towards chemical education and self-education, chemical sciences, chemistry, functional literacy in the field of chemical technologies and industries, chemical aspects of healthcare, substances and chemical materials and their human use.
9. Taking into account the conducted research, it is promising to develop a methodology for assessing students' professional qualifications in chemistry, as well as to modernize the professional and methodological training of a chemistry teacher at a university.

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