

*K. P. Vergeles, G.S. Kovaleva, N.I. Kolachev, I.O. Sadovshchikova*

### **SHARING EXPERIENCE IN PROVIDING FEEDBACK IN THE PROCESS OF ASSESSING AND DEVELOPING FUNCTIONAL LITERACY**

*The article focuses on an analysis of existing approaches to providing feedback based on a criterion-referenced approach for evaluating and reporting results with the aim to identify features that can be used in the national functional literacy instrument. Critical concepts in the field of formative assessment are analyzed, the experience of international comparative studies (PISA, TIMSS, PIRLS), and the way of providing feedback based on competency profiles are described. For comparison, the approach to providing feedback, which was used in the project “Monitoring the formation of functional literacy” in the first stage of the instrument's development and testing, is given. In conclusion, the directions for further work on the development of the instrument are featured.*

**Keywords:** *functional literacy, feedback, reporting of results, formative assessment, PISA, TIMSS, PIRLS, proficiency levels, achievement levels, competency profiles.*

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*E. L. Rutkovskaya, A.V. Polovnikova*

### **ASSESSMENT AND FORMING FINANCIAL LITERACY: TASK MODELS AND THEIR DEVELOPMENT**

*The article focuses on the evolution of PISA financial literacy assignments presented to 15-year-old students during the three stages of the study. A visual comparison of the scope of tasks for 2012, 2015 and 2018 is carried out. On the basis of a quantitative analysis of measuring materials, a conclusion is made about a significant reduction in the number of aspect tasks and an increase in the proportion of complex tasks. Specific examples show the evolution in approaches to the development of tasks that assess and develop financial literacy in domestic practice, similar to the practice of developers of measuring materials of the PISA study, conducted with the participation of the author. The importance of aspect assignments at the initial stage of work on the creation of educational and methodological, including evaluation materials on financial literacy is emphasized. The peculiarities of complex tasks and their broader possibilities in assessing and developing financial literacy of students are emphasized, which are taken into account when creating a bank of tasks for monitoring the formation of functional literacy at the Institute of Education Development Strategy of the Russian Academy of Education. Special attention is paid to the issue of level representation of financial literacy assignments in the developed complexes. The components included in the set of tasks on financial literacy used in the 2020 monitoring study are considered in detail. It presents empirical data on the performance of assignments of different difficulty levels by ninth-graders (age of PISA study participants) belonging to five groups with different levels of financial literacy.*

**Keywords:** *functional literacy, financial literacy, complex assignments, financial literacy level, PISA (Programme for International Student Assessment).*

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*T. W. Koval, S.E. Dukova*

### **«GLOBAL COMPETENCE»: EXPERIENCE IN THE DEVELOPMENT OF NATIONAL EDUCATIONAL AND DIAGNOSTIC MATERIALS**

*The article shows the approaches and analyzes the actual results of developing the national tools for the formation and assessment of the global competence of 5–9 grades students in the framework of such a direction of functional literacy as «global competence». The authors identify methodological guidelines for the formation of content and competence-based areas of assessment of this direction of functional literacy based on the indicators of the international program for assessing the educational achievements of students PISA; requirements for the educational results of the Federal State Educational Standard of basic general education; didactic approaches to the educational process that have developed in the domestic education system; taking into account the age characteristics and social experience of students in grades 5–9. The study reveals the features of the phased formation of the conceptual framework for global competence. Based on the data obtained in mass approbation of tasks and their expert assessments, the authors focus on the directions for further improving the content component, and the conceptual framework for assessing the global competence of students. The article contains examples of the characteristics of tasks from the educational and diagnostic materials on «global competence».*

**Keywords:** *PISA, functional literacy, global competence, education quality assessment, tasks for the formation and assessment of global competence.*

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*E. L. Rutkovskaya*

### **SCHOOL EDUCATIONAL SPACE: OPPORTUNITIES FOR THE DEVELOPMENT OF FUNCTIONAL LITERACY**

*The article examines the school educational space in the context of its opportunities for the development of functional literacy of students. Functional literacy seems to be the basis for a possible and expedient combination of efforts of all teachers of an educational organization that has included this task among its priorities. A description of the interdisciplinary approach to the organization of work aimed at solving the problems of developing functional literacy is given. The article focuses on the conclusion obtained as a result of the international research PISA, about the higher level of functional literacy of students of those schools, where there is a coordination of actions of teachers, the integration of their efforts, demonstrated in the course of the study. The possibilities of creating conditions that ensure the successful organization of cognitive activities aimed at developing functional literacy are shown using specific examples from the experience of developing students' financial literacy. Examples of*

*various teaching aids on financial literacy for schoolchildren are given, including training modules built into the curriculum for certain educational subjects, and elective courses. The existing pedagogical practices of the development of functional literacy (using the example of financial literacy) in the process of project activities of schoolchildren are described. The importance of the introduction into educational practice of contextual problematic tasks reflecting typical life situations requiring the use of knowledge and skills mastered by students is noted.*

**Keywords:** *functional literacy, educational outcomes, educational space, integration of school teachers, teaching materials on financial literacy.*

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*L. O. Roslova, E.S. Kvitko, L. O. Denishchev, I. I. Karamova*

### **THE PROBLEM OF FORMING THE ABILITY TO “APPLY MATHEMATICS” IN THE CONTEXT OF LEVELS OF MATHEMATICAL LITERACY**

*The article continues the study of the concept of mathematical literacy, which began in article [7] by setting out the conceptual foundations of its formation and evaluation. In this article, this concept is considered in the context of highlighting the levels of mathematical literacy. The approaches to describing the levels of mathematical literacy in the international research PISA (Program for International Student Assessment) for the period 2003–2019, the main factors determining it, are given. Taking into account the specifics of Russian results, 5 levels of mathematical literacy are proposed, and their qualitative description is given. Three complex tasks containing tasks of various levels are given, relevant comments are given and the characteristics of each task are presented: context, domain of mathematical content, type of cognitive activity, type of item, level of mathematical literacy, assessment of answers, planned learning outcomes, computing tools used, use of computer tools. Suggestions are given regarding the use of complex tasks for assessment and for the formation of mathematical literacy. Conclusions about the decisive influence of subject and metasubject learning outcomes on the quality of the formation of mathematical literacy are proposed.*

**Keywords:** *functional literacy, levels of mathematical literacy, PISA international research, basic general education.*

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*E. S. Korolkova, A.A. Kozlova*

### **FORMATION OF FINANCIAL LITERACY OF SECONDARY SCHOOL STUDENTS: THE WORK OF SUBJECT TEACHERS**

*The article is devoted to the problem of the formation of financial literacy among secondary school students. The relevance of this issue is determined by the fact that the problem of the formation of functional literacy at school is not only the main international trend, but also the task of Russian education, formulated by special*

*regulations. Financial literacy is one of the elements of functional literacy. The article presents the experience of using complex tasks on financial literacy in various subjects within the framework of secondary education. Using the experience of a Moscow school as an example, the possibilities of forming students financial literacy are revealed, specific methods and techniques for including complex tasks in the work of a teacher of social studies, computer science, mathematics, a foreign language, etc. are presented. The article discusses the possibilities of using extracurricular and project activities to form financial literacy. The article defines the features of complex tasks and their differences from traditional questions and tasks. Each set is a block of tasks based on one financial literacy situation. Each assignment is aimed at developing a certain competence: identifying financial information, analyzing information in a financial context, assessing financial problems, applying knowledge and understanding, justifying financial choices. Thus, it is complex tasks, thanks to the activity approach, that successfully contribute to the formation of financial literacy. The authors emphasize that the success of work on the formation of functional literacy is possible only if the entire teaching staff is involved in this activity and cannot be the result of the efforts of only one teacher.*

**Keywords:** *functional literacy, financial literacy, complex assignments, teacher experience, financial situations, general educational activities, meta-subject connections, inter-subject interaction.*

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*T. V. Koval, S. E. Dukova, O.I. Sadovshchikova*

### **«GLOBAL COMPETENCE»: ANALYSIS OF THE RESULT OF FUNCTIONAL LITERACY MONITORING**

*The authors analyze the results of assessing the formation of the global competence of students, obtained during the monitoring of the functional literacy of students in grades 5–9 (2019–2020). The study focused on the dynamics of cognitive skills' group formation that were included in the conceptual framework of global competence. The paper showed the methodology and substantiated the possibility of comparing the results obtained based on tools developed in 201–2020 (situations and tasks which followed the requirements of the Federal State Educational Standard of basic general education and the approaches in international study of the quality of education PISA). The interpretation of the results discussed touched upon a) the problem of content — the knowledge component of such a direction of functional literacy as «global competence», namely, knowledge in the area of global problems and intercultural interactions; b) the problem of the formation and presentation of cognitive skills in conditions of increasing complexity of the content component (on the basis of the ability to evaluate information); c) the problem of determining the level of complexity of tasks for the formation and assessment of the global competence of students. The authors considered deficits in forming the cognitive skills as potential opportunities for improving the quality of education of students in secondary school; emphasized the importance of the interdisciplinary (metasubject) approach in the*

*formation of the global competence of students in grades 5–9. The article contains examples of tasks aimed at the formation and assessment of the ability to give arguments, examples of students' answers and recommendations for the formation of this skill.*

**Keywords:** *PISA, functional literacy, global competence, education quality assessment, cognitive skills, ability to argue / give arguments.*

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*O. B. Loginova, N.A. Avdeenko, S.G. Yakovlev, O.I. Sadovshchikova*

### **PROJECT “FUNCTIONAL LITERACY MONITORING”. CREATIVE THINKING: FIRST RESULTS**

*The article discusses Creative Thinking framework, tasks specificity and first results of diagnostic work, fulfilled by student of 5th — 9th grades in 2019–2020. The research is focused on finding out and describing the areas in which students demonstrate the competence to think creatively, that is to engage productively in the generation, evaluation and improvement of ideas, which can result in original and effective solutions, generation of new knowledge, and impactful expressions of imagination. The results show that it is easier to students to demonstrate creative thinking in common situations — when they are creating literary texts and making social decisions. It is easier to students to generate ONE idea, than develop range of DIFFERENT ideas. It is difficult to the majority of students to demonstrate the competence to evaluate and improve ideas.*

**Keywords:** *functional literacy, creative thinking, content model of creative thinking, competency model of creative thinking, PISA, assessment of the quality of education, educational outcomes, learning situation and learning task.*

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*J. N. Gostev, M.I. Kuznetsova, L. A. Ryabinina, G. A. Sidorova, T. J. Chaban*

### **PROBLEMS OF ASSESSMENT AND FORMATION OF LOWER SECONDARY EDUCATION STUDENTS' FUNCTIONAL READING LITERACY**

*The article is devoted to the description of conceptual bases of reader literacy assessment as a component of functional literacy in the context of international study PISA and practice of measuring materials modeling in the framework of monitoring of reading skills assessment in Russia. The changes that have appeared in the development of tools for assessing the reading skills of schoolchildren are described. The article analyzes the results of diagnostics of reading literacy as one of the components of functional literacy of students in grades 8 and 9 in one of the Russian regions, provides examples of tasks, and pays special attention to the analysis of results for four groups of reading skills. Based on the obtained results, the authors draw preliminary conclusions about possible changes in the educational process that will contribute to improving the level of reading literacy of general school students, also*

*the authors while emphasizing the need for a broad discussion of the identified problems in the scientific and pedagogical community.*

**Keywords:** *reader literacy, functional literacy, educational process, evaluation practice, PISA, lower secondary education students.*

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*L. O. Denishcheva, K. A. Krasnyanskaya, O.A. Rydze*

### **APPROACHES TO DRAFTING ASSIGNMENTS FOR MATHEMATICAL LITERACY OF 5TH-6TH GRADE STUDENTS**

*The article presents a study related to the formation of mathematical literacy of students in grades 5–6, within the framework of an innovative project of the Ministry of Education of the Russian Federation “Monitoring the formation and assessment of functional literacy”. In this study, as a basis for identifying levels of mathematical literacy, the concept of mathematical literacy is used, understood as “an individual’s capacity to reason mathematically and to formulate, employ and interpret mathematics to solve problems in a variety of the real-world contexts” [2, p. 67; 3 p. 8]. Approaches for identifying levels of mathematical literacy are based on the description of the levels for 15 year olds adopted in the international study PISA (Program for International Student Assessment) 2018 g. [4] In this article, approaches to the formation of mathematical literacy are considered in the framework of the relationship between its levels developed for students in grades 5–6 and tasks corresponding to these levels. Particular attention is paid to the description of approaches to the design of mathematical tasks. Based on the analysis of the results of monitoring the functional literacy of Russian students, 3 levels of mathematical literacy are proposed for students in grades 5–6, and their meaningful description and characteristics of the corresponding tasks are given. Examples of tasks corresponding to different levels are given. We believe that the requirements and comments for the tasks described in the article will help the authors of textbooks and teaching aids for students and teachers to develop tasks that contribute for the formation of functional literacy of students in grades 5–6.*

**Keywords:** *mathematical literacy, levels of mathematical literacy, the international study PISA, requirements for the development of tasks.*

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*A. Y. Pentin, N.A. Abroad, E. A. Nikisheva, G. Y. Semenova*

### **PERFORMANCE LEVELS OF SCIENTIFIC LITERACY BASIC SKILLS BY STUDENTS OF THE MOSCOW REGION: DIAGNOSTIC RESULTS**

*The article presents modern approaches to the development of didactic tools intended for the formation and assessment of the levels of scientific literacy of students. Testing of tasks for measuring scientific literacy was carried out in the course of diagnostic test in grades 8 and 9 of schools in the Moscow region. The authors analyzed the competencies and skills that are necessary to achieve the scientific*

*literacy. The students performing of tasks of different levels of complexity are considered, and the reasons for difficulties in completing tasks are analyzed. Based on the analysis, the cognitive operations are described that are necessary for performance of different level tasks. The formation of the skills highlighted in the article can be considered as a promising direction for updating the methods of teaching natural science subjects.*

**Keywords:** *scientific literacy, learning outcomes, competencies and skills, level of complexity, cognitive operations, teaching methods.*

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*T. P. Afanasieva, G.L. Kopoteva, I.M. Logvinova, I.V. Merzlikin, E.N. Young*

### **METHODOLOGICAL SUPPORT AS A FACTOR OF FORMATION OF FUNCTIONAL LITERACY IN THE GENERAL EDUCATION SYSTEM**

*The article is devoted to the problem of methodological support for the modernization of educational systems of schools to ensure the formation of functional literacy in students. The role of methodological support in the successful formation of functional literacy has been substantiated. The purpose of the article is a methodological substantiation of the construction of a system of methodological support for the formation of functional literacy in educational institutions on the basis of its structural and functional modeling. The methodological foundations of the research were: system-activity approach, system analysis; key provisions of the theory of developing pedagogical systems. The construction of a system of methodological support for the formation of functional literacy in general education included: the formation of an aggregate subject of methodological support, capable of providing it at all stages of development and implementation of functional literacy as a systemic innovation; determination of interrelated directions of methodological support, methods of its implementation and results; distribution of directions and tasks of methodological support between the levels of the system of methodical work and methodological structures that make up the aggregate subject of methodological support; development of methodological support measures. The creation of a system of methodological support on the basis of the proposed model assumes taking into account the opportunities available in the general education system for its implementation, planning and implementing a system of actions that ensure its “cultivation” from the existing system of methodological work. To determine the current state and opportunities for the development of the system of methodological work in general education, the method of analysis of expert assessments of representatives of regional, municipal and school methodological structures was used. In our opinion, the methodology for constructing a system of methodological support for the formation of functional literacy in schools on the basis of the presented model creates the necessary prerequisites not only for solving the problem of methodological support for functional literacy, but can also be used in the implementation of other large-scale pedagogical developments affecting each school.*

**Keywords:** *innovative activity, methodological support, methodological support model, general education, systemic innovation, functional literacy.*

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*O. A. Abdulaeva, I. D. Alexashina, Yu P. Kiselyov, I.V. Mustina*

### **MONITORING TO ASSESS THE FUNCTIONAL LITERACY OF STUDENTS IN SAINT PETERSBURG: EARLY RESULT**

*The article presents information about the regional diagnostic work to identify the level of functional literacy of students in grades 5 and 7 of educational organizations in St. Petersburg in 2020. A brief description of the research methodology and specific diagnostic tools is given. Primary data on the percentage of task completion by students in grades 5 and 7 for certain types of competencies in three types of functional literacy: reading, mathematics and science are presented. Based on the analysis, the assessment of the state of functional literacy of students in grades 5 and 7 of educational organizations in St. Petersburg for each type of functional literacy, identified areas of adjustment of research tools, recommendations for improving the educational programs of schools in St. Petersburg and the system of teacher training.*

**Keywords:** *functional literacy, assessment of functional literacy, diagnostic tools for assessing students' functional literacy, organization of assessment procedures, characteristics of tasks for assessing functional literacy, results of diagnostics of students' functional literacy.*

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*E. A. Belovolova, V.F. Soldatov*

### **SCHOOLCHILDREN' FUNCTIONAL LITERACY MONITORING: NEW OPPORTUNITIES FOR DEVELOPING REGIONAL ASSESSMENT OF THE GENERAL EDUCATION QUALITY**

*The article presents some approaches to the development of regional assessment of the quality of education based on the results of participation of educational organizations in the Moscow region in the project of the Ministry of education of the Russian Federation "Monitoring the formation of functional literacy of student".*

**Keywords:** *regional assessment of the quality of education, regional diagnostic work, meta-subject results, functional literacy.*

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**SCIENCE LITERACY: FROM REGIONAL MONITORING TO SCHOOL PRACTICE**

*Science literacy (SL) includes the ability to explain phenomena scientifically, evaluate and design scientific inquiry, and interpreting data and evidence scientifically. It defines a person's ability to participate in reasoned discussion of problems related to science and technology, and in general, his ability to engage with science-related issues, and with the ideas of science, as a reflective citizen. The SL level assessment of schoolchildren in world practice is carried out within the framework of the Program for International Student Assessment (PISA). The results of Russian schoolchildren throughout all the cycles of these studies remain rather low. This, in turn, requires the adjustment of domestic educational technologies to achieve better results in the formation of students' science literacy. As an example, a description of the structure and purpose of the Diagnostic Test (DT8) on the SL, conducted annually in the Krasnoyarsk Territory among 8th-grade students, is given here. The results of DT8 of 2019 are discussed and the key problems and directions for the subjects of the science field are highlighted, along which it is necessary to carry out work to develop the meta-subject skills of students in order to form their science literacy. Emphasis is placed on practicing the ability to recognize scientific issues, apply scientific research methods, interpret data, and use scientific evidence to draw conclusions.*

**Keywords:** *PISA, science literacy, diagnostic test, educational results, meta-subject skills, educational system, competences*

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