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Развитие функциональной грамотности средствами современного искусства

Проблема и цель. Уровень развития функциональной грамотности проверяется Международной программой по оценке образовательных достижений учащихся или PISA (Programme for International Student Assessment), где российские обучающиеся демонстрируют слабые позиции. В качестве одного из способов улучшения результатов международного тестирования предлагается изучение произведений современного искусства и конструирование на их основе заданий широкого охвата научных областей по формированию функциональной грамотности, вовлекающих обучающихся в творческие задания проектного типа.

Цель статьи: показать способы развития функциональной грамотности с помощью учебно-познавательных и учебно-практических задач, разработанных в процессе постижения произведения французских композиторов Пьера Шеффера (Pierre Henri Marie Schaeffer) и Пьера Анри (Pierre Henry) «Симфония для одного человека» («Symphonie pour un homme seul»), обладающего широкими педагогическими возможностями.

Методология и методы. За основу развития функциональной грамотности средствами современного искусства взяты системно-деятельностный, личностно-ориентированный и полихудожественный подходы. Использовался анализ теоретических источников в области педагогики и искусствоведения.

Результаты исследования. Педагогический потенциал современного искусства, в частности, произведений конкретной музыки, открывает значительные перспективы для создания обучающимися своего творческого продукта, сочетающего виды разных искусств, что требует развития учебно-практических навыков при вовлечении широкого круга информации для получения креативного результата. Образовательная направленность заключается в воплощении концептуальной идеи в литературно-музыкальной композиции и ее визуализации с привлечением персональных компьютеров, подключенных к сети Интернет, звуковых динамиков, usb-микрофона, компьютерных программ.

Заключение. Знания, умения и навыки, полученные при изучении современного искусства, эффективны в формировании функциональной грамотности в общем и дополнительном образовании, урочной и внеурочной деятельности, при интеграции содержания уроков искусства и учебных предметов основной школы.

Ключевые слова: читательская грамотность, естественнонаучная грамотность, математическая грамотность, Международная программа по оценке образовательных достижений учащихся (PISA), современное искусство, конкретная музыка, педагогика искусства

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Developing functional literacy by means of contemporary art

Problem and objective. The level of functional literacy is checked by the Programme for International Student Assessment, where Russian students demonstrate their weak positions. As one of the ways to improve the results of international testing, it is proposed to study works of contemporary art and to construct, on their basis, tasks of a wide range of scientific fields aimed at forming functional literacy, involving students in creative tasks of a project type.

The purpose of the article is to show ways to develop functional literacy through educational-cognitive and educational-practical tasks developed in the process of comprehending the work by French composers Pierre Henri Marie Schaeffer and Pierre Henry *Symphonie pour un homme seul*, which has wide pedagogical capabilities.

Methods. Developing functional literacy by means of contemporary art is based on the system-activity, person-centred, and multi-artistic approaches. The analysis of theoretical sources in pedagogy and art history was used.

Results. The pedagogical potential of contemporary art, in particular, works of concrete music, opens up significant prospects for students to create their own creative products that combine different types of arts. This requires the development of educational-practical skills with the involvement of a wide range of information to obtain a creative result. The educational orientation consists in the implementation of a conceptual idea in a literary-musical composition and its visualisation with the involvement of personal computers connected to the Internet, sound speakers, a USB microphone, and computer programmes.

Conclusion. The knowledge, skills, and abilities obtained in the study of contemporary art are effective in forming functional literacy in general and additional education, lesson and extracurricular activities while integrating the content of art lessons and school subjects of basic school.

Keywords: reading literacy, natural science literacy, mathematical literacy, Programme for International Student Assessment (PISA), contemporary art, concrete music, art education

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Introduction

To prepare the younger generation for a full-fledged existence and activity in a contemporary environment that is subject to constant transformations of all aspects of life, it is necessary to shift the educational perspective from memorising ready-made educational material to acquiring the skill to independently extract and transform information, create a new creative product using the latest technologies. Under these conditions, teaching only academic literacy concentrated on scientific notions and reflecting the level of mastering the subject content of education turns out to be insufficient. Now, education is faced with the problem of forming students' functional literacy to prepare them for active existence in contemporary technocratic society.

According to the UNESCO Thesaurus, functional literacy is "a general concept relating literacy to improved living conditions" [1].

In modern Russian studies, functional literacy is defined as the human ability to adapt and effectively exist [2], as well as "to use all the knowledge, skills, and abilities constantly acquired during life to solve the widest possible range of life tasks in different spheres of human activity, communication and social relations" [3, p. 35].

The Programme for International Student Assessment (PISA), identifying functional literacy in 15-year-old students who have received compulsory general education, implies the study of knowledge and skills necessary "for full functioning in contemporary society, i.e. for solving a wide range of tasks in various spheres of human activity, communication and social relations" [4]. Thus, functional literacy appears through the formation of certain competencies in students, represented "as the ability to mobilise knowledge, skills, attitudes and values, as well as to show a reflexive approach to the learning process and provide an opportunity to interact and act in the world" [5, p. 86].

According to the results of PISA, Russian students demonstrate a low level of functional literacy. At the same time, according to the results of participation in international studies testing the educational quality of national pedagogical systems – *"Trends in Mathematics and Science Study"* or TIMSS; *"Progress in International Reading Literature Study"* or PIRLS – Russian students have quite high achievements in academic literacy.

The variability of the format and content of the PISA tests does not permit students to prepare for concrete exercises, which leads to the inevitability of acquiring the skills to transfer the acquired knowledge to different life situations. Therefore, creative tasks, where it is necessary to attract additional information from various scientific fields, as well as from everyday life and personal experience, can become effective for forming and developing students' functional literacy. At the same time, students will need the skills to formulate, annotate the idea, interpret and transform it into all kinds of visual forms, solve project-type problems, logically transform the text, reflect, and resort to the help of intuition, insight, and critical thinking. Saturation of the content of educational-cognitive and educational-practical tasks with knowledge and skills for mastering works of art in project activities, identifying their language and speech characteristics will help to acquire experience in working with the concept, the context, to interpret them in connection with the orientation.

Wide opportunities for designing creative tasks for forming functional literacy lie in the field of contemporary art, rich resources of which contain a huge pedagogical potential. By providing students with a complex of knowledge, skills, and abilities in comprehending the

samples of contemporary art, they will have the opportunity to independently refract them in various situations, which will contribute to developing functional literacy.

The authors will propose ways to develop functional literacy through educational-cognitive and educational-practical tasks developed on the basis of studying the work by Pierre Henri Marie Schaeffer and Pierre Henry *Symphonie pour un homme seul* (1950).

Under the name "symphony", the authors meant special attention to sounding [6] when embodying a person in music: "A lonely person had to find his symphony in himself, being his own instrument. He screams, whistles, walks, laughs, groans. His heart beats, his breathing quickens, he utters words, calls, and others respond. Nothing responds to a lonely cry like the noise of a crowd" [7, p. 47]. Schaeffer and Henry were also interested in the social aspect of a person's existence, his loneliness when interacting with other people.

The musical basis of the composition consisted of exclamations, whispers, laughter, scattered phonemes, accompanied by steps, claps, blows and knocks, the sound of orchestral instruments and a prepared piano. The works created by the technical transformation of the sounds that fill the world recorded on a tape recorder belong to the direction called "concrete music", the founder of which is Pierre Henri Marie Schaeffer. When creating music, using all the sounds of the surrounding life, "musical objects", separated from the source and the environment that generates them, Schaeffer put a special meaning in them, recognising their intrinsic value. Advocating for special attention to the sound resources, Schaeffer developed aspects of listening, inventing a new direction in the science of "aculogy" [7; 8].

Schaeffer and Henry conceived their composition *Symphonie pour un homme seul* as a musical-dramatic radio play. At the same time, the French dancer and choreographer Maurice Béjart discovered in the work kinaesthetic means of embodying sound in dance, creating a choreographic performance.

The choice of this composition for pedagogical purposes is explained by the significant educational potential inherent in its innovative style, susceptibility to translation into the languages of other arts, the use of computer technologies, and the interactivity of the artistic process, which expands the possibilities of students' self-realisation.

Literature review

The literature on developing students' functional literacy by means of contemporary art, based on the problems, can be divided into three sections. The first section should include sources related to functional literacy in preparation for participation in PISA. The second section includes books on the pedagogy of art, the third one – on contemporary art.

Sources on functional literacy are represented by scientific and methodological literature. The scientific monograph by Frolova "Formation of functional literacy as a basis for the development of educational and cognitive competence of students of a technical college in the process of studying humanities" examines the ways of applying the competence approach in professional education, emphasising the relevance of the problem of literacy formation throughout a person's life [9].

Scientific articles analyse the tools, methodology, forecasting, and monitoring of functional literacy formation within the framework of the project of the Ministry of Education of the Russian Federation [10]. The relationship between the success of the functional literacy formation and the development of the educational content is experimentally confirmed [11].

The complexity and duration of the process of forming functional literacy under the condition of a combination of various modern pedagogical technologies are shown [12].

A large number of teaching aids reveal the essence of the notion of "functional literacy", the characteristics of tasks for its formation, approaches to the development of their contents, methods for mastering them in practice, ways of constructing didactic support [5; 13–15].

A separate group of sources includes proceedings from analytical reports and examples of open PISA tasks on various types of functional literacy for the period from 2000 to 2018 [16–19].

The second section of the literature of this research consists of books on the pedagogy of art [20; 21]. It is significant to emphasise "the artistic and creative development of children and youth, the formation of their individual artistic abilities", to recognise the harmonious development of a person through the cognitive function of art and culture as an important condition [22].

Researchers of art pedagogy highlight the cognitive orientation of artistic activity associated with visual communication. The predominance of visual culture in the contemporary world, which replaces the verbal way of transmitting information, raises the question of the need to change the educational paradigm, where "the development of the visual culture of a growing person is a resource for his future success" [23].

The third section of the literature of research on developing students' functional literacy by means of contemporary art consists of books about concrete music. Special attention is paid to the works by the French composer, music theorist, engineer, writer, French radio announcer, discoverer of concrete music Pierre Henri Marie Schaeffer [7; 8].

Pierre Henri Marie Schaeffer's studies of the concrete music were developed in the works of his students and followers [24–29].

Within the framework of the present research, works related to the interaction of sound and image from technical, linguistic, environmental, semiotic, and aesthetic positions, the embodiment of sound life experience in creativity, the impact of sound affect in the professional practice of working with film sound attract attention [30; 31].

Materials and methods

Developing functional literacy by means of contemporary art is based on the system-activity and person-centred approaches in education, the theory of developmental education. The system-activity approach provides creative self-development of students, conditioned by the principle of "unity of consciousness and activity" (Rubinstein), involving them in different forms of work and comprehension of systemically organised objects of knowledge.

The person-centred approach emphasises individual educational activities based on the development of aptitudes and abilities of each child, his or her self-determination concerning the educational trajectory, the choice of fundamental metasubject objects of knowledge. Independent research activity in accordance with the person-centred approach is motivated by the ability to create a creative product by one's own efforts, is aimed at increasing knowledge and developing abilities.

The theory of developmental education (Davydov, Elkonin), focused on improving cognitive activity, develops active moral, civic positions that encourage students to direct the acquired knowledge, skills, and abilities in accordance with life circumstances.

The research is also focused on the domestic concepts of artistic and creative education of students, including the multi-artistic approach (Yusov), which determines the interaction of different types of arts in all kinds of activities, and the system of aesthetic education of Bakushinsky, which implies the freedom of artistic creativity, finding figurative meanings of art and living in it.

The methodological basis of the research was also made up of works on musicology [32–34], and the theory of visual perception [35; 36].

The analysis of theoretical sources in the field of pedagogy, art history, theoretical modelling, synthesis of a holistic educational process, design of creative tasks, and pedagogical observation were used as research methods.

Results

After introducing students to the audio recording of Schaeffer and Henry's composition, let us reveal its author's idea, the centre of which is a person: "We want to play this game: no tools, nothing but a person. A person is an instrument that is played too rarely" [7, p. 48]. The author's implementation of the idea of the work is close to conceptual art, where the main thing is "documenting the concept and the process of its materialisation" [37, p. 592].

The analysis of the PISA tasks shows that the system-forming element of their content is the concept: "Concentration of the content of the check around concepts, compared to the more traditional thematic approach, allows a broader characterization of the check results from the standpoint of mastering concepts related to real phenomena of the surrounding world" [5, p. 102].

By training the skill of working with the concept of contemporary art as the basic principle of tasks to identify the level of functional literacy, the authors will offer children, following the example of the studied work by Schaeffer and Henry, to find their idea for the implementation of concrete music by sound means. These can be social or psychological aspects of the life of a real or fictional person. The chosen idea should be written in the genre of an essay or story with a historical, fantastic, fairy-tale, mythological, detective, adventure, mystical plot, which will become the basis of their future literary and musical project.

According to the analysis of the PISA test results, domestic students experienced the greatest difficulties when answering questions that require a free form of expressing their own opinions [16; 17]. Thus, the task of composing one's own literary text on the chosen topic, aimed at formulating one's own point of view and logical construction of the idea in the text of a conceptual orientation, improves the level of reading literacy. Guided by information from different areas of knowledge, children learn to demonstrate the acquired level of their mental, spiritual and moral, aesthetic development. Creating one's own text will require students to interpret the existing knowledge in accordance with the concept, the rules of the genre, the adequacy of the idea, the logic of the coordination of parts and the whole when building the text form, a competent presentation of the material with the involvement of cognitive procedures of comparison, matching, and generalisation.

Giving the chosen idea the form of a literary story on different subjects helps to develop the skill of interpretation, separation of the main from the secondary, thematic refraction in different situations dictated by the plot, paraphrasing, working with multi-level elements of the text.

The next step in mastering the work *Symphonie pour un homme seul* is the selection of the sound scale to the written literary composition. The soundtrack can be composed of an online library of sounds and noises, as well as of sounds recorded by children themselves. To complete the tasks, personal computers, sound speakers, headphones, a USB microphone, a microphone stand, an Internet connection, and a programme – a legal free audio editor Audacity are needed.

Let us think over the sound image of the composition. When working on the *Symphonie pour un homme seul*, Schaeffer and Henry focused on the sounding of the human voice, footsteps, breathing, heartbeat: "This is what a person has the right to do, what is given to him today, to express himself, if he can" [7, p. 48].

Let us try to record human sounds and noises using a microphone, that is, musical objects of concrete music. At first, these will be sounds produced by movement, and then different intonations and gradations of volume and emotional state of voices – male, female, and children's. The recorded version is transformed using the effects of the Audacity programme, which permit to repeat a certain fragment as many times as necessary, play the desired section from the end to the beginning, change its speed and playback height, smoothly increase or decrease the volume, and create a sense of visible space. Working with effects will make the recording obtained with the help of a microphone visible, create a beneficial ground for associations, filling the invisible space with different ideas: it can be a classroom, a school buffet, a desert island on a native or fantastic planet. Changing the foreground and background will convey a plastic image and create the impression of moving objects.

The resulting recording must be structured to give a coherent logical form of the musical whole. Schaeffer and Henry conceived the composition of their work as a contrasting alternation of sound objects represented by the transformed sounds of human voices, musical instruments, noises, objects, that is, concrete sounds [7, pp. 52–53]. Students are able to perform sound editing in Audacity, creating collages of recorded sound objects and organising them according to a conceived plan.

Figure 1 Waveform of *Symphonie pour un homme seul* by Pierre Henri Marie Schaeffer and Pierre Henry

Another way of understanding Schaeffer and Henry's *Symphonie pour un homme seul* is possible. Its first stage will be building a musical collage of the most impressive sounds of the surrounding life. Sounds should be recorded purposefully both in noisy places – transport interchanges, markets, railway stations, and in natural landscapes – in the forest, park, rural areas, beaches in different times of the year and weather conditions. The resulting musical collage will be an associative excuse and an incentive to create one's own tale or story.

The sound form of *Symphonie pour un homme seul*, presented in the figure, shows the number of sections, their frequency, spectrum, duration, and dynamics. Working with a graphical representation of sound trains the skill of translating from a symbolic description into a verbal one, processing specially encoded information, and interpreting various forms of text.

Such work will serve the development of reading, mathematical and natural science literacy, which implies the ability to use standard algorithms; will teach to reveal and interpret the meaning of recordings made using various symbols, in this case, sound associations; will help to make decisions related to the peculiarities of a particular situation, as well as to formulate a problem based on the conditions set; to answer clearly the question posed; to develop a plan and strategy for solving a problem; to look for ways to optimise the solution.

The literary and musical composition created by students should be visualised. As an example, the authors will analyse the creative embodiment of *Symphonie pour un homme seul*, performed by the choreographer Maurice Béjart. The choreographer interprets the sound ideas of Schaeffer and Henry with a stage transformation into a musical and choreographic composition, where the opposition of both male and female images, and solo and ensemble numbers, becomes the basis of dramatic development. The timbre composition of the sections and the number of voices heard in it determines the gender composition and the number of the ensemble of dancers. Their alternation marks the boundaries of the sections, making a slender, symmetrical composition.

As is known, "visual interpretation of a musical masterpiece opens up new opportunities to identify its meanings. ... The essence of the visualisation phenomenon in relation to the music representation lies in its hermeneutic nature and consists in understanding, 'translating' and commenting on specific musical content in the figurative-linguistic system of an adjacent art form, bypassing its verbal characteristics (and thereby determining their accessibility for speakers of different linguistic cultures)" [38, pp. 46, 50]. In this case, accessibility was determined by the dynamic nature of Schaeffer and Henry's work, which interested Maurice Béjart and made such a "translation" possible.

After listening to the composition, Béjart conceived a choreographic performance, seizing on Schaeffer's idea, according to which the event remains at the heart of any sound object [8].

Béjart's example should inspire students to create their own choreographic compositions or pantomime performances. It is useful for this to develop one's own system of gestures as "signs of human activity", part of the "integral language system and an important component in creating the perception of art" [32, p. 16].

The nature of the actions will tell the children the sound product they received: "An image of movement in which a gesture, facial expressions, a quick or slow reaction of a 'character', a turn, an approach or withdrawal, an aspiration or contemplation, a stop, an impulse are conveyed – through all this wide range of possible shades, the listener grasps the sphere of content hidden in a particular type of movement" [34, p. 182].

There are other ways to visualise a literary and musical composition created by children. One of them is to create an album of photos. Photos can not only consistently convey the plot but also reflect its contextual associative series. Placing a photo album in a digital environment, creating a slideshow will require mastering such programmes as Studio 52, My Photo Books, Photo Show PRO, Movavi Slideshow, Simply Slideshow, and possibly programmes that generate images: Adobe Spark, Fotor, Dynamic Dummy Image Generator, Texture Maker.

The next visualisation method is to create a cartoon. One should immerse oneself in the study of types, styles, genres, and techniques of painting to draw a cartoon that meets the figurative characteristics of both the literary and musical side of the composition. In the case of realising not a drawn cartoon, but, for example, a puppet cartoon, one should also carefully consider the adequacy of images and materials for their production. It is possible to realise the cartoon idea with the help of a number of computer programmes: Gifovina, Multator, MultiPult, AnimaShooter, Anime Studio, Animator, Express Animate, FlipBook, Hippani Animator, Muvizu, Piskel, Pivot Animator, PowToon, Sketch.js, Slimber, Synfig Studio, Wick.

Another way of visualisation is to create a video. Its theme should be consistent with the musical and literary product created by children and based on the associations that make up the chosen context. One can shoot the necessary shots by oneself or edit them from the virtual video library. Such exercises develop computer literacy, the ability to work with websites and tabs.

Discussion

An analysis of existing tasks aimed at forming functional literacy revealed the absence of an appeal to contemporary art in their organisation, plot, and evaluation criteria. At the same time, the rich imagery and emotional expressiveness of masterpieces significantly stimulate cognitive processes. Besides, reading, mathematical and natural science literacy is usually formed on the basis of the relevant sciences, which excludes training in the skill of transferring the acquired knowledge to other situations.

The effectiveness of developing students' functional literacy with the help of creative tasks designed in the process of acquaintance with works of contemporary art is explained by the rich range of tasks inherent in it. Comprehension of a piece of concrete music *Symphonie pour un homme seul* by Pierre Henri Marie Schaeffer and Pierre Henry, being a vivid artistic embodiment of translation into languages of various arts, can become the basis for creating exercises that include a variety of artistic and creative activities in literary and musical composition, computer and body visualisation.

Concrete music exists in the form of a phonogram; it is impossible to record it with notes using fixed sounds. At the same time, a piece of concrete music can be represented as a waveform, oscillogram, or spectrogram showing the acoustic characteristics of sound. Such a feature of concrete music will teach students to comprehend information in the form of coding, decoding, graphs, and symbols.

Works of contemporary art serve as an occasion for the development of project activities aimed at the acquisition of students' experience of collective interaction, the ability to socialise in different situations, to improve the culture of speech communication, oral and written communication. Complex creative tasks of a project type of various subjects and

formats teach to interpret the information presented in different ways, to influence it and to apply it for solving a variety of problems, develop spatial representations, stimulate cognitive processes, ultimately forming reading, mathematical, natural science and computer literacy of students.

Personal participation of each child in the creation of a creative product expands the associative field, educates the flexibility of thinking in search for solutions to problems set, permits to understand the essence and possibilities of science in application to everyday human needs.

Comprehension of contemporary art, introduction to it by creating one's own creative product following the example of its best examples helps not only to form functional literacy in students but also to bring up a responsible, purposeful, and disciplined person, which remains the main goal of education.

Conclusion

Mastering contemporary art has a fruitful effect on developing students' functional literacy. Studying the peculiarities of the works of contemporary art, children, through their own experience, in educational-cognitive and educational-practical activities, work out their properties such as conceptuality, context, and collage. Getting acquainted with artists' creative processes, students master ways to create their own works with the help of digital technologies. At the same time, children gain experience with computer programmes, an audio editor, learn sound recording, types of technical editing, and also comprehend the laws of art – the artistic transformation of reality, the proportionality of form, the subordination of parts and the whole, repetition and contrasts. The acquired skills are suitable for use in a variety of educational and life situations, which contributes to the successful completion of the PISA test.

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