Research of Formation of Students' Information Culture in the Educational Environment

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Abstract. The aim of the study was to form and prove in practice the effectiveness of the model for the development of the information culture of schoolchildren in educational and extracurricular activities in the information and educational space. In this article, we have summarized the theoretical provisions on the formation of the information culture of students in the educational environment. The process of development of the information culture of schoolchildren in the modern education system, a model for the development of the information culture of schoolchildren in educational and extracurricular activities are presented. The theoretical and methodological base has been determined, which allows using technological, axiological, cultural, systemic and activity approaches to establish principles and structure meaningful and organizational and didactic tools for methodological support of this process; the content of the cognitive-procedural, value-motivational, reflexive-activity and personality-developing components and coefficients, their corresponding levels and diagnostic tools; program and methodological materials display the relevant content of training, the use of information and communication technologies in educational and extracurricular activities; a model with didactic conditions has been formed, elements of the information and educational space of the school have been consistently, purposefully and structuredly included in the development of the information culture of students.

1 Introduction

Innovative information technologies are increasingly being introduced into the education system. In this regard, the learning process becomes to a large extent informational. Students receive new information, process it and subsequently apply it in the educational environment. Pedagogical theory has developed an information concept, which made it possible to identify certain pedagogical and didactic problems. The form of acquiring knowledge in the educational process determines the ways of searching for the means of their presentation in the educational process. It is necessary to develop new methods that allow processing information, updating educational and cognitive operations, methods of assimilating knowledge and presenting it. In an expanded understanding, it is necessary to

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find methods for developing the information culture of participants in the educational process. At the same time, the course towards "visual learning" indicates the importance of the potential of using such tools in the educational process as models, images, images, which sooner or later will replace ordinary texts. Interaction with a system of signs and symbols, the transition from one sign system to another, the processes of encoding and decoding information - all this must be able to be carried out by each member of today's information community [6]. On this basis, the question arises about the information culture of a person, the need for the development of which is indicated by many modern scientists. Among them Venidiktova D.N. [1], Lichik A.A., Petrova I.V., Kostolomova Yu.V. [2], M.P. Lapchik, J. Merredith, E.G. Skibitsky, B.F. Skipner, E.K. Henner and others.

The use of a personal computer as a tool for cognition inevitably leads to the emergence of new types of creative, mnemonic and mental activity of the individual. In this regard, a person must be able to correctly use the appropriate semantic constructs reflected in the sign system of both natural and artificial languages. This is the reason for the attention we pay to the development of an information culture that needs to be carefully studied. It should be noted that to date, methods for its development in educational and educational activities have not been developed. In addition, the possibilities of the current school for their implementation are still poorly studied [4].

In the framework of this study, we carried out a conceptual and in-depth analysis of the problem of forming the information culture of primary school students. On this basis, we can argue that the modern school, including its initial links, cannot exist in isolation from the computerization of the educational system. The paper provides a conceptual understanding of the research problem, but it is important to emphasize that this process alone will not be able to transfer the education system to a qualitatively higher level. The article also presents a model with five components. Specifically, it's a target; theoretical and methodological; meaningful; procedural and evaluative-effective components.

2 Research Methodology

The process of developing the information culture of schoolchildren in educational and extracurricular activities will achieve the best results if the following conditions are met [9]:

- it is necessary to determine the theoretical and methodological base that allows the use of technological, axiological, cultural, systemic and activity approaches to establish the principles and structure the content and organizational and didactic tools for the methodological support of this process;
- the content of the cognitive-procedural, value-motivational, reflective-activity and personality-developing components and coefficients, their corresponding levels and diagnostic tools provides a more accurate and stable result;
- in the program and methodological materials, the relevant content of training, the use of information and communication technologies in educational and extracurricular activities should be displayed;
- the formed model, coupled with didactic conditions, will allow to consistently, purposefully and structuredly include elements of the information and educational space of the school in the development of the information culture of students.

Research methods: theoretical - analysis of psychological and pedagogical literature, modeling; empirical - observation, questioning, testing, conversations with participants in the educational process, ranking; experimental - experimental work, including diagnostic and formative stages; statistical - quantitative, qualitative and comparative analysis of data obtained during the study, and their processing.

3 Results and Discussions

The process of formation of the information culture of younger schoolchildren in educational and extracurricular activities is presented by us in the model. Structurally, the process of formation of information culture is represented by five components, functionally - this is the relationship between the components of information culture of younger students (cognitive-procedural, value-motivational, reflective-activity, personality-developing) of the process of its formation [10].

The model is represented by five components. Specifically, it's a target; theoretical and methodological; meaningful; procedural and evaluative-effective components.

The first component is the target component (formulation of the main goal and tasks necessary to achieve it, that is, the formation of an information culture of younger students based on the integration of educational and extracurricular activities and meeting modern requirements).

Purpose: formation of information culture of younger schoolchildren in educational and extracurricular activities [11].

Tasks:

1. To study theoretical approaches to understanding the terms "information culture", "information culture of younger students in educational and extracurricular activities", to identify their essence and structure.

2. Determine the potential of educational and extracurricular activities of schoolchildren to develop their IC.

3. Create and present theoretical justifications, as well as test the model for the development of the IC of schoolchildren in educational and extracurricular activities.

4. Carrying out experimental activities, evaluate the effectiveness of the model for the development of IC for schoolchildren in the information and educational space of an educational institution, taking as a basis the established criteria for its effectiveness.

The second component is theoretical and methodological (description and justification of the conceptual base for the formation of information culture of younger students in educational and extracurricular activities; approaches and principles) [12].

As shown in the first chapter, as indicators of the information culture of a younger student were taken: information literacy; information consciousness and information behavior. These indicators have become the basis for defining the very concept of "information culture" and for developing a strategy in the activities of a primary school teacher to form the information culture of students. Research base: primary classes of the Municipal Budgetary Educational Institution "Secondary School No. 11 in Grozny, and the Municipal Budgetary Educational Institution "Secondary School No. 3 in Urus-Martan. A total of 170 primary school students and 14 teachers took part in the study.

140 schoolchildren of grades 2-4 participated in the experimental work [13].

We carried out experimental activities in the period from 2020 to 2023. It was carried out in three stages:

The first stage (2020) is the study of various sources on a given research topic.

The second stage (2021-2022) - conducting a stating experiment.

The third stage (2023) - we refined the theoretical apparatus and methodological basis of this study.

The results of the analysis of the motivational sphere of schoolchildren, in the study of which the modified method of A.V. Matyukhina obtained the results that the majority of participants in the control (41%) and 38% of the experimental group are characterized by a low level of development of information activity (which primarily implies the organization of their leisure time). 49% of the CG and 50% of the EG have an average level, and only

10% of the control and 12% of the experimental group have a high level (children strive to acquire new knowledge and skills) [14].

The results of the study indicate that 76% of the control group and 70% of the experimental group showed a low level of theoretical knowledge in computer science, and only 24% of the control group and 30% of the experimental group showed an average level. The skills and abilities of almost all primary school students in the control (70%) and experimental (72%) groups are at a low level, 28% of the control and 24% of the experimental groups are at an average level, and only 2% of the control and 4% of the experimental groups are at a high level [15].

Based on the results of monitoring the activities of primary school students during testing, we can state that they mostly experienced difficulties in the process of completing tasks. As a rule, they chose answers at random.

The results of the study according to the method of A.V. Karpova say that only 5% of the control and 8% of the experimental group of schoolchildren are capable of correctly planning future information activities or analyzing the ones already carried out, that is, they have a high level of reflection formation. In 32% of the control and 36% of the experimental group, reflection is formed at an average level [16]. Most of the subjects - 63% of the control and 56% of the experimental group - showed a low level. Associated with this are minor qualitative changes in other components of the IC of primary school students.

So, having carried out diagnostic measures, we can conclude that the level of development of the main components of IC among primary school students is low. Research suggests that the level of development of individual components of the IC in a small part of schoolchildren corresponds to the average, but this is only the lower limit of the average. Both the control and experimental groups showed approximately the same level, which indicates initially almost the same level of knowledge and skills of the subjects of these groups [17]. The ascertaining experiment allows us to say that the school should organize regular and purposeful work on the development of the IC of primary school students, indicate the need for a systematic organization. The effectiveness of such work will increase if students are involved in this activity, both during school hours and after school hours. In the context of our study, psychological and pedagogical conditions were identified that contribute to the effective formation of the information culture of younger schoolchildren during school and extracurricular activities.

After conducting a formative experiment, the results were obtained that, for the most part, the respondents of both groups are characterized by a low level of development of information activity motivation (41%) and 38%. This is primarily due to the organization of their leisure time. 49% of the control and 50% of the experimental group showed an average result, and only 10% of the control and 12% of the experimental group showed a high result (meaning that they are eager to acquire new knowledge and skills) [18].

Due to the fact that the motivational component of the IC of the majority of primary school students is not sufficiently developed, it is difficult to develop the other components in them.

After carrying out the formative stage of the study, we can conclude the following: that only 9% of the respondents in the control group are capable of properly planning future information activities or analyzing those that have already been carried out. This means that their reflection is formed at a high level. In the experimental group, this figure is 28%. In 51% of students in the control and 56% of the experimental group, reflection is formed at an average level, and in 40% of students in the control and 16% of the experimental group it is low [17].

The schoolchildren included in the experimental group showed a positive trend. This proves that the concepts of IC development we have created are working. When conducting

experimental lessons, we resorted to active methods and forms of learning. First of all, we used a didactic game. Parsing and analyzing game situations in the lessons, we laid the foundations for the formation of information models. A set of developmental tasks for design made it possible to establish interdisciplinary connections and acted as a material for the formation of abilities for analysis and synthesis. Mostly in the lessons that were conducted as part of the experiment, we offered the children to perform practical developmental tasks.

While conducting classes, we also actively used such a technique as a game metaphor. In almost all classes, metaphorization of the learning environment of interaction took place. For this purpose, we used computer support for classes [15]. This provided a visual materialization of the main metaphorically game environment of educational activity. Before explaining this or that material, we showed the children text documents, cards, slides, etc., which served as supporting metaphors for the topic of the lesson (the State of Informatics - the Bay of Pictograms, Rebusograd, the Geometric Ocean, the Island of Models, etc.). This approach contributed to the activation of cognitive interest and the development of figurative thinking of schoolchildren.

At the final stage of the course, we conducted several project sessions. In these classes, schoolchildren, using the acquired knowledge and skills of working on a PC, developed their personal computer projects on the proposed topic.

The results of experimental activities give grounds to assert that it turned out to be very effective in the formation of the IC of primary school students. This is also indicated by observational data, which made it possible to state its sufficient effectiveness in development.

In general, the experimental activity carried out by us also allows us to assert that its idea, organization and implementation methodology made it possible to cope with the practical tasks identified in this study.

As a result of the study, the following results were obtained [16]:

1. We have established and substantiated the conditions for the development of the information culture of primary school students in educational and extracurricular activities.

2. We have identified the possibilities of educational and extracurricular activities for the development of the IC of schoolchildren. We reflected these opportunities in three areas – “technological”, “motivational-need” and “information-value”.

3. We provided theoretical substantiations and tested methods for developing the IC of schoolchildren in educational and extracurricular activities (with the help of elective courses, a teaching electronic complex, adaptive educational technologies, presentations, modeling and design, integrated classes).

4. We have developed the content of the lessons on the development of IC, using the methods we have established.

5. We have formed and provided a theoretical justification for the criteria-evaluating apparatus for determining the degree of development of IC.

6. We have received positive dynamics for each criterion indicating the development of the information culture of schoolchildren.

The methodological foundations for designing a pedagogical system for the formation of information culture of a younger student are determined and the theoretical outlines of the scientific justification for the development of the components of information culture of a schoolchild that we have identified are outlined: value-motivational, reflective-activity, cognitive-procedural and personality-developing.

The model of formation of information culture of the younger schoolchild developed by us reflects: the purposes and tasks of the corresponding activity (the target block); methodological foundations (theoretical and methodological block); content components that ensure the formation of knowledge and skills of information activity of actions in the

IEE (content block); ways, forms and methods of organizing training (procedural block); assessment of the level of formation of the components of the digital culture as a whole (evaluative and effective block).

The pedagogical conditions for the implementation of the model of formation of the information culture of the younger schoolchild are determined. They include:

- creation of an information environment, taking into account the age and individual characteristics of elementary school students;
- the use of computer technology in the study of all subject areas of elementary school;
- the readiness of teachers to use information technology in their professional activities.

4 Conclusions

In the framework of this study, we carried out a conceptual and in-depth analysis of the problem of forming the information culture of primary school students. On this basis, we can argue that the modern school, including its initial links, cannot exist in isolation from the computerization of the educational system. The paper provides a conceptual understanding of the research problem, however, it is important to emphasize that this process alone will not be able to transfer the education system to a qualitatively higher level: it is necessary to change the teaching methodology itself. In order to develop the information culture of primary school students, an educational methodology should be developed that takes into account the extensive and complete integration of curricula and subjects in the context of developmental education. At the same time, an interdisciplinary approach and interdisciplinary connections in the learning process should be approved. From this point of view, the main purpose of the PC, as this study proves, is to use it as an effective tool already in the lower grades.

Conducting a theoretical study allows us to say that today it is necessary to transform the school of memorization into the school of development.

Theoretical and practical aspects of the use of PC in the educational process indicate that the computerization of education should be carried out in terms of the development of the introduction of computers in the process of learning information culture. This process should be considered as the most rational orientation corresponding to such a task as preparing a person for life in the conditions of the information community.

Such a category as information culture is considered in the study as the development of the IC of primary school students in educational and extracurricular activities. In particular, it is considered as a process, the purpose of which is to develop in schoolchildren, through the integration of educational and extracurricular activities, a systematized understanding of the information picture of the world, skills in the field of ICT, as well as the need to use them in solving problems.

Summarizing the results of the study, we can conclude that the development of IC implies the formation of certain qualities - a systematic and theoretical orientation of thought processes, flexibility of thinking, the ability to form information models, the ability to find and process information, the ability to plan actions.

The study indicates that pedagogical support for the comprehensive development of the IC of primary school students should consist in creating a single information-developing and developing space of school education, aimed at developing the position of the student as an active participant in the ongoing information activities.

Summarizing and structuring the results of the pilot study, we can put forward a number of pedagogical conditions for the development of the basics of IC in primary school students in the learning process with computer learning components:

- creation of an information environment, taking into account the age and individual characteristics of elementary school students (introduction of the practical course "Computer and its capabilities" in extracurricular time);

- the use of computer technology in the study of all subject areas of elementary school.

Summing up, we note that the theoretical conclusions made during the study and the empirical results reflected in it prove that the hypothesis we originally put forward was confirmed.

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