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### **Formation Of Information Culture Of Primary School Students**

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**Abstract.** *This article describes the relevance of information culture formation for primary school students. Possible solutions to this problem are considered. Moreover, by reasoning and results of research, the scientific and practical significance of information culture formation for primary school students is summed up. The result of designed for students of primary school teaching and learning means is considered, which contribute to formation of information culture and development of intellectual abilities of students, as well as further preparation of children to education process at the basic school.*

**Key words:** Information society, computer science, information culture, informatization of education.

### **Introduction**

The development of modern period of civilized society can be called informational. Information society puts forward the new demands on its members such as the possession of certain knowledge, skills and abilities, which in previous stages of society development can be considered as optional or at least not urgent.

Therefore one of the main directions of the development process for modern society is informatization of education, which provides a broad introduction to the practice of psycho-pedagogical research aimed at the intensification of the learning process, the implementation of the ideas for developmental education, improvement of organization forms and methods of educational process, ensuring the transition from mechanical assimilation of factual knowledge to the mastering the ability of independently acquiring new knowledge. Among the qualities that school will form in modern generation the following should be mentioned: the ability to plan the structure of their actions (planning); the ability to build an information model of the object or process under study (modeling); the ability to organize search for information (search); discipline of communication and the ability to structure messages (communication); skills to handle new techniques and new technologies in different life situation (instrumentation activities); technical skills for the most common tools in Information Society such as Computers.

This problem could not be solved within the traditional school disciplines other than computer science, because none of the scientific disciplines reflected in the school subjects, does not possess a well-developed concept for the supply of the appropriate action.

An important contribution to the development of a course was made by the following scientists: A.P. Ershov,<sup>1</sup> G.A. Zvenigorodsky,<sup>2</sup> Yu.A. Pervin,<sup>3</sup> G.NoX,<sup>4</sup> K.

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<sup>1</sup> A.P. Ershov, "Concept of Informatization of Education," in *Education and computer science*, VI (1988), p. 3-22.

<sup>2</sup> A.P. Ershov, G.A. Zvenigorodsky, Yu.A. Pervin, *Computer science in school (Concepts, Condition, Prospects)*, Novosibirsk, Academy of Sciences of the USSR, 1979.

Parmentier,<sup>5</sup> etc.

In dialectical development of strategic objectives for school computer science, the slogan of universal computer literacy, which is relevant to the first stage of computer science, was gradually displaced by the more urgent task of information culture formation. This increases the need for the formation of information search, analysis, processing, storage, distribution, representation of this information to other people in the most efficient manner. We are talking about formation of work culture with information at schools.

A relatively new term "information culture" originally appeared in the pedagogical theory and practice in connection with the introduction of computer science subject as a compulsory subject in basic school.<sup>6</sup>

Information culture is a characteristic of cultural level of modern young person who knows how to work with the needs of everyday life with computers and information systems, databases, and spreadsheets, personal computer and information networks, which assumes not only new tools of activity, but also (and most importantly) a new vision of the world. Information culture, due to the fundamental components of its concepts, should be formed in schools, beginning with the first school lessons.

This implies that one of the education priority tasks should be the formation of information culture for students of secondary school, many elements of which should be in the primary education.

The study of computer science in primary school is an essential tool in the development of a new literacy, the content of which is much wider than the classic "three skills", corresponding to the traditional content of primary education: read, write and count. It is intended as extension of reading concepts (active search for all varieties and types of information, its perception and analysis), writing (information object creation of various kinds, organization of information appropriately) and counting (design and construction of activities, a variety of constructions, including logical). New literacy is a combination of basic linguistic, processing and communication skills, the ability to work with certain materials, instruments of mental and physical labour, the ability to perform operations and procedures, that is, internal and external technologies. New literacy is a basic of educational springboard to subsequent stages and spheres of study.

It should be emphasized an extremely important advantage of the early introduction of young students to the sphere of computer science; the transfer of this subject on the initial stage of education is a factor of preservation for children's unity of the world (so often destroyed in the traditional methods of primary

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<sup>3</sup> Yu.A. Pervin. *Methods of early computer science learning*, 2<sup>nd</sup> edition, Moscow, "Binom", Laboratory of knowledge base, 2008.

<sup>4</sup> G. Nox, "What can computers give to pedagogy: a view from the American school?," in *Computer science and education*, I (1990), p. 107-112.

<sup>5</sup> K. Parmentier, "Computer science in a French school," in *Computer science and education*, II (1991), p. 111 -113.

<sup>6</sup> Yu.A. Pervin, "The course of "Fundamentals of Computer Science" for primary school," in *Computer science and education*, XII (2002), p. 7-12.

Almira IBASHOVA, Elmira ORAZBAYEVA, Altynay KALZHANOVA, Lyazzat BULETOVA, Asel YESNAZAR

education), developing their ability to approach the problem as a whole, not formalized and prepared.

Psychological readiness of the child for life in information society should be formed in the first years of school. This is primarily due to the necessity of mastering the information literacy. But another important task is to inculcate abstract thinking skills and ability to think logically. All this imposes new quality requirements for the first link of school education in primary school. In our opinion, many of the elements of learning computer science should start in primary school. At this age, children are easier to assimilate the basic concepts of computer science and master practical computer skills. New Information Technologies in Education combined with traditional means contributes to the development of child as a creative person.

### **Objects and Methods of eesearch**

#### *Rationale.*

Currently, there are a large number of researches, a lot of comprehensive courses, program-methodical complexes, individual learning and teaching solutions, dedicated to education and application of information technology in primary school.

Analysis of local and foreign research reveals the following trends in primary school teaching:

Firstly, instead of integrative courses, today we have courses, which differentiate in its content theoretical and practical aspects;

Secondly, the role of courses that emphasize deep study of certain theoretical questions is growing, while there is a danger that well-researched material by students will not be in demand in the course of further education.

Thus, both theory and practice of pedagogy agreed on the need to introduce computer science from the first steps of the school and ending (if we talk about the school education stages) with Farewell bell. It is absolutely clear (again based on the main objectives of computer science in school), that it is not about prevocational training and learning programming within the school subject "Computer science", it is about the general education course, which essentially represents the course of information culture. Since a person's ability to live effectively and efficiently, in our opinion, is formed in the process of studying the subject of computer science, this subject understood by us as the basis of planning regularity and implementation of targeted actions, that is, the need to teach children from the first grade.

A child in the first year of study in their physical and mental qualities is essentially a preschooler, and by the end of the first and beginning of the second year he/she has some features of teen age contradictions and complexities, and therefore requires a special approach to their education.

At the same time, in the presence of various and different approaches to teaching primary school students, there are few publications in Kazakhstan, which would describe specific positive results and validity of teaching primary school students. This, we believe, is due to the fact that the above approach focuses on the

acquisition of solid skills in reading and writing, elementary experience of linguistic communication. And thus the main task of teaching primary school students is providing the initial formation of the child's personality, the identification and development of his ability remains in the shadows. This contributes to the lack of developed scientific problems and practical ways and methods of teaching primary school students, which has a negative effect on the creation of a solid base for further development of the educational programs in grades of primary and basic schools.

The above arguments determine the rationale of our research.

*Goal of the research* is the formation of information culture for students of primary school on the basis of the developed workbook in computer science and educational program for primary school students.

*Research object* is educational process of primary school students.

*Research subject* is the initial formation of the child's personality, identification and development of his abilities.

From the above research objectives the following goals are evident:

- Analyze psycho-pedagogical and methodical literature on the topic of research, and identify features of education on the subject of computer science for primary school students;

- Formulate the principles of learning content selection for primary school students;

- Develop educational and methodological program of education for computer science in primary school.

*The methodological basis of the research* are the achievements in the field of didactic and methodology of teaching in the primary grades, the basic provisions of the knowledge theory; student-activity approach; age, psychological and individual characteristics of elementary school students; theoretical propositions on the relationship of learning and development, education system development concept in Kazakhstan.

*The theoretical basis of research* was made from works of leading local and foreign psychologists, didactics and teachers: A.N. Leontiev<sup>7</sup>, S.L. Rubinstein<sup>8</sup>, J. Bruner,<sup>9</sup> J. Dewey,<sup>10</sup> J. Piaget,<sup>11</sup> P.Ya. Galperin,<sup>12</sup> S.Pepert,<sup>13</sup> B. Hanter,<sup>14</sup> etc.

The following research methods were used to achieve the goals: theoretical analysis and synthesis of psychological and educational literature; pedagogical

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<sup>7</sup> A.N. Leontiev, *The problem of psyche development*, Moscow, Mysl, 1965.

<sup>8</sup> S. L. Rubinstein, *Genesis and consciousness. Human being and world*, St. Petersburg, Piter, 2003.

<sup>9</sup> J. Bruner, *Cognitive psychology: Outside of direct information*, Moscow, Progress, 1977.

<sup>10</sup> J. Dewey, *School and society*, Moscow, Rabotnik prosvesheniya, 1965.

<sup>11</sup> J. Piaget, *Selected psychological works. Psychology of intelligence. Logic and psychology*, Moscow, Prosveshenie 1969, p. 9-53.

<sup>12</sup> P. Ya. Galperin. *Introduction to Psychology: formation of attention*, Moscow, Izdatelstvo, 1974.

<sup>13</sup> S. Pepert, *The Children's Machine: Rethinking School in the Age of the Computer*, Moscow, 1992; S. Pepert. *The Connected Family: Bridging the Digital Generation Gap*, Moscow, 1996.

<sup>14</sup> B. Hanter. *My students are working on computers*, Moscow, Prosveshenie, 1999.

Almira IBASHOVA, Elmira ORAZBAYEVA, Altynay KALZHANOVA, Lyazzat BULETOVA, Asel YESNAZAR

supervision of students work; interviews with primary school teachers; questionnaire survey of teachers; study of students creative products.

## **Results and discussion**

*Scientific novelty of the research:*

- Purpose and goals of computer science for primary school students are determined to form their information culture;

- Educational and methodological program was developed for the formation of information culture of primary school students.

*The theoretical significance of the research* consists of justification for new theoretical postulates revealing the content and method of teaching primary school students based on student-active approach.

*The practical significance of the research* is the ability to use the research results in schools with the introduction of mathematics, language and computer science for elementary school students, the development of teaching aids for primary school teachers of the Republic of Kazakhstan and as a basis for further research on the issue of computer science in primary schools.

According to the Concept of development of Kazakhstan education system today methodical system of computer science education is undergoing significant changes. The problem of content selection for computer science education, especially in the elementary grades is one of the most important.<sup>15</sup>

One of the most important criteria by which the educational content should be selected is teaching principles. The basic principles of general didactic and methodological teaching, took as a basis for selection of content for education in computer science programs for elementary school students are listed below.

*Principle of humanity*, i.e., priority of human values and health of a child, idea of free development.

*Principle of scientificity*, manifested in accordance with offered to students knowledge and latest achievements of scientific progress, consistency of science.

*Principle of consistency* is to plan the content in the ascending line, where subsequent knowledge builds on previous knowledge.

*Principle of systematicity*, which means systematization of the studied knowledge and formed skills in the system.

*Principle of compliance with the goals of the educational content:* The goal of education determines the content of computer science course. In this regard, the content of the course, in addition to the basic concepts of computer science, such as "algorithm", "information", "technology" should also include questions on planning the actions needed to achieve a certain goal by using a fixed set of resources; questions on the organization of research information needed to solve the problem; questions on information structure for the description of objects and systems; technical skills of interaction with the computer.

*Principle of individual education:* the pace of studying computer science, levels of difficulty and creative education activities must match the interests, the

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<sup>15</sup> \*\*\* , *Concept of Education Development of Kazakhstan till 2015*, Kazakhstanskaya, Pravda., 2003, p. 11-15.

possibility and necessity of each student.

*Principle of availability, age and connection with life:* content of computer science for primary school students must comply with their age and physiological characteristics, their life experience. Educational material should lead student's life experience in accordance with the scientific level of social experience in the mainstream of computer science. Therefore, the study of child's personality through his work is one of the most important methods of the educational process in elementary school.

*Principle of clarity:* computer science for primary school students is based on the specific samples (tables, diagrams, drawings, demonstrations, crosswords), which are perceived by students not only through the visual, but also motor and tactile sensations. This principle enriches the range of ideas for students, develops observation and thinking, helps to deeply absorb educational material.

Development prospects of the country and each region is determined not only by historical past, current situation, but also by attitude of the younger generation, its vision of the real and proper, internal openness, tolerance and the degree of social communication skills.

Speaking about the future of the younger generation head of the state Nursultan Nazarbayev stressed that: "... in the upbringing of the new generation we should refer to the most simple, understandable and at the same time deeply moral and spiritual life of every nation, to the traditions. Their role in life of people is undeniable. Cultural traditions have always been a source of social renewal ... that is why traditions allow a person "not to be lost" and adjust their lifestyle to the rapid changes of the modern world".<sup>16</sup>

Primary school students cannot be considered as a blank page, which can be filled with anything. A child before coming to school spends a certain period of their lives at home or at preschool institution. Because of this, a child is a member of the social environment, even though unconsciously he or she formed a view on the environment, and get some experience. It is this individual, personal experience of a child, acquired at home and in preschool institutions should be used and developed at computer science lessons. Naturally, in this case we must take into account his age and psycho-physiological characteristics.<sup>17</sup>

The first feature of the younger students is their inability to think abstractly. This is reflected in the method of selecting the content of computer science subject for primary school students.<sup>18</sup>

The content of computer science subject is based on the concept of information. This is due to the fact that the information is related to a lot of

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<sup>16</sup> N.A. Nazarbayev, "Ideological consolidation of society as a condition for progress in Kazakhstan," in *FPE. Kazakhstan*, XXI (1993), p. 10-15.

<sup>17</sup> E.Y. Bidaybekov, A.B. Ibashova. *Condition and prospects of computer science development in primary schools of the Republic of Kazakhstan. Proceedings of the Great Moscow seminar on the methodology of early education to computer science*, edited by Yu.A. Pervin, 3<sup>rd</sup> volume, Moscow, publ. RSSU, 2012, p. 29-42.

<sup>18</sup> A.B. Ibashova, G.K. Nurmuhambetova. *Psycho-pedagogical features of young students at studying computer science MIIMNMK "Mathematical modeling and information technologies in education and science"*, 2<sup>nd</sup> volume, Almaty, Kazakh National Pedagogical University named after Abai, 2003, p. 275-280.

Almira IBASHOVA, Elmira ORAZBAYEVA, Altynay KALZHANOVA, Lyazzat BULETOVA, Asel YESNAZAR

modern life, and the information is the basis for many of the concepts and phenomena. Without the information there is no life for a person and many careers depend on how quickly information comes on state of affairs in a company, how quickly large amounts of information are examined and processed, it depends on the speed and accuracy of accepted decision. Students should realize that the information they are interested in is easy to find, with a minimum of effort and time.<sup>19</sup>

Introduction of computer science subject for primary school students provides the ability to tell children about computer, show the whole range of its capabilities, and prepare children to use a computer. At the computer science lessons the system of world perception is formed, and understanding of common information connections for variety of natural and social phenomena. In this regard, lessons of computer science are widely using various forms of lessons, games and visual methods of training and control of knowledge, connection to daily life, as well as materials of such school subjects as mathematics, natural sciences, Kazakh, Russian and English languages, etc., interdisciplinary connections are disclosed.

Computer science courses in primary school are very important:

*Firstly*, for forming various types of thinking, including operational (algorithmic). The learning process combines the development of logical and creative thinking.

*Secondly*, for carrying out the practical work with information, and for acquiring skills to work with modern software. Mastering computer for primary school students will help them to use computer as a tool for their activities in the classroom.

*Thirdly*, for the idea of the universal possibilities for using computer as a tool of learning, counting, image editing, and other entertainment.

The content of computer science subject deepens in subsequent grades and consists of the following topics:

1. *Introduction. Safety instructions in computer classroom.*

2. *Information and information processes:*

3. What is information? Ways to transfer information. What can you do with the information? Saving information. Save to search.

Lesson repetition. Competitions "Ways to transfer information", "Saving of information". Distortion during transmission of information. Information handling. Information processing algorithm. Information processes. Lesson repetition. Competitions "Transmission of information", "Information processes. Information handling", "Information Processing Algorithm". Information coding. Information encryption. Lesson repetition. Competitions "Encoding and encryption information."

4. *World of computers and computers:*

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<sup>19</sup> A.B. Ibashova, Yu.A. Pervin, *Sources, guidelines, prospects of informatization concept of primary education in the Republic of Kazakhstan. Natural Sciences*, Yaroslavl, Yaroslavl Pedagogicheskiy Vestnik, 2013, p. 19-27.

Basic computer devices. Input and output devices. Pointers and cursors. Mouse cursor. Text cursor. What is an icon? Types of icons. Icons on computer screen. How does window works. Name of the window. Menus and Toolbars.

Workspace, scroll bar, status bar. What is a menu?

Computer Menu. Lesson repetition. Competitions "Cursors", "Icons", "Programs and its window", "Menu".

#### *5. Information and communication technologies:*

Working with text cursor. Window of text editor. Editing of text information. Graphic editor. Window of graphics editor. Tools of graphic editor menu. Storing information in a graphical editor. Processing graphic information.

Lesson repetition. Competitions "WordPad", "Paint". The concept of Internet, Information processing.

Students should know the following:

- the concept of information, diversity of its forms;
- information media;
- information processes (transferring, processing, storage of information);
- purpose of the main computer components;
- safety instructions when working on the computer;
- application, role and capabilities of computer in various fields of human activity;

– comprehension of action;

– main action sequences (linear, branching, repetition);

– purpose and main features of text and graphics editor;

– presentation forms of information on computer.

Students should be able to do the following:

– provide examples of information and information processes;

– give examples of information media;

– give examples of actions;

– use to draw with random "colors" and "brushes";

– use text editor to set, edit and format a simple text.

Content includes theoretical (definitions of certain concepts, properties, rules, etc.) and practical materials, relevant life experience of students, which are arranged in order of complexity of their components. This is logical pivot of the course. Questions of a practical nature are disclosed on the basis of real-life actions and abstracting by calculation methods, filling tables, etc., it goes up to the level of theoretical knowledge. Also there is a system of tasks with which students should learn both theoretical knowledge and acquire skills defined by the program.

Tasks are available in various forms, which stimulate the activity of the children, and arouse their interest. Often these tasks are an entertaining and comprehensive. With the help of these tasks mistakes are prevented made by

Almira IBASHOVA, Elmira ORAZBAYEVA, Altynay KALZHANOVA, Lyazzat BULETOVA, Asel YESNAZAR

students as a result of mixing the similar questions of discipline; in this case we offered tasks to identify different by comparison.<sup>20</sup>

Teaching aids are given to help teachers, there teachers can find a thematic planning for each section of the course, the requirements for knowledge, skills of students at the end of the school year; material for the oral exercise and plans for the majority of lessons. Planning and lesson plans are exemplary, i.e. the teacher, in accordance with his students, can make changes to the order of issues introduction, or change the time allowed for the study of a topic. However, the material should be studied, provided by the program for each academic year and at the appropriate level.

At each lesson different tasks are performed aimed at the development of memory, attention and logical thinking. It stimulates independence and the activity in solving problems. Introduction of a computer is seen as a way to activate the creative development of the personality. Computer software in a form of a game creates a learning environment, which provides feedback in the process of solving problems.

A computer promotes the formation of self reflection for students. It allows students to visualize the results of their actions. At the same time students more carefully choose options for action to be taken in emergency situations. This contributes mainly by training software that helps to improve mastering of the material, and stimulate cognitive activity of students in the classroom. It is useful to combine the training software with other teaching aids (devices, drawings on blackboard, tables).

There is the algorithm at the core of any software for its implementation. Thinking through the sequence of computer programs implementation, it is necessary to pay attention to the complexity of the algorithm used and the possibility of its implementation depending on the formed skills of students. In other words, it is necessary to comply with such didactic principle as accessibility (adequacy of previously acquired knowledge). From one software to other software there is a complication of not only the methods of working with a computer, and a variety of ways, but also the complexity of the algorithm on which the software is built. Thus, introduction of material follows the formula "from simple to complex".<sup>21</sup>

In the absence of such computer didactic materials, we have developed a package of educational software (PES) for information support of our methodology.

In PES, except software designed for learning computer science and technology of information processing on computers for elementary school students, there is a computer software both dynamically forming didactic materials and tasks on information technologies, Kazakh, Russian, English languages and

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<sup>20</sup> A.B. Ibashova, Yu.A. Pervin, *Informatization concept of primary education in Kazakhstan. Proceedings of the II research and practical conference "The Russian teacher in the system of modern education*, Moscow, Moscow State Pedagogical University, 2013, p. 146-153.

<sup>21</sup> *Ibidem*, p. 153-160.

arithmetic, and computer software promoting the harmonious and comprehensive development of the personality.

Thus, the solution for tasks is a set of software as a whole; it can be represented as a set of the following educational goals. Firstly, it is learning of computer science and information technologies on the computers in the primary school. Secondly, computer skills are connected with the examples of the material covered by Kazakh, Russian and English languages, literature and arithmetic. Thirdly, when working at a computer, student develops attention, learns the basics of algorithmic approach to solving problems, creates an abstract perception of objects and logical thinking, enhances memory, learns to find new things, and realizes the potential of the creative imagination.

We use methodical chain of specially designed software that consistently fulfils skills with increasingly expanding set of keys, without using a typing tutor.

"Information" software attracts cognitive interest of children and positive emotional attitude towards computer technologies, preparing them for further structured education.

The concept of information is a basic element of the theoretical (information) line of the course. One of the basic concepts of computer science course is a philosophical category of information. Therefore, the course does not give a strict definition of this concept.

The basis for this feasibility is the primary nature of concept. This unusual feasibility for a young person is illustrated by examples on time of year definition and making story according to these examples.

This software provides individual perception of the world, using a subjective experience of children in the interpretation and evaluation of the facts, phenomena, events and surrounding reality.

Creatively working primary school teacher can use this software in addition to its direct purpose. The software has the ability to generalize, organize and find practical applications for received skills of students.

"Text editor Balbobek" software.

This software has a non-intrusive operation speed, it makes possible to work out the correct pressing of computer keys and allows children to use the cursor keys, information input key, and mouse. The software takes into account involuntary memory, which plays an essential role for primary school children.

With the help of this software students see how to store the information they need, transfer it in the database (input, write) and get it from the database by the user (output, read).

"Cell" software.

"Cell" software helps students to solidify their knowledge on "Commands" topic. This software can also be used as a graphics editor with simple interface.

At the same time, it is no coincidence that the study of computer graphics tools in nearly all school curricula follows by the development of the text information processing methods. It is connected, in our opinion, with two reasons. The first reason is that the graphics, such elementary parts of the graphic

Almira IBASHOVA, Elmira ORAZBAYEVA, Altynay KALZHANOVA, Lyazzat BULETOVA, Asel YESNAZAR

information, as points, lines, figures, despite of their simplicity for children, according to the methods of computer reproduction is still inferior to simply and easily typing letters, symbols, words.

The second reason is that the most of the fundamental concepts of computer science required for children as the primary tool of thinking formation in information society today have more methodical parallels with text information processing technology, rather than with computer graphics. Text discretisation and its subdivision on structural elements such as paragraphs, lines, and symbols can cause the association with a structured description of the algorithm divided into stages, items, commands.

Thus, the serial arrangement of two topics in the general education course of early computer science learning (first text processing information, and only after that technology of computer graphics) is the most natural, at least at the current level of applied didactic tool such as information editor and teaching methodology of computer science.

“Balbobek’s Adventure to the Land of Knowledge” software helps to study such subjects as mathematics, Kazakh, Russian and English languages, computer science. This software is specifically forms the notion of "algorithm" and aimed at the development of algorithmic style of thinking. There is a meta-knowledge of knowledge with the use of this software at the lessons on the organization of scientific information, methods of information search, transformation rules, i.e., actualization of mental efforts that ensure the mastery of scientific knowledge of objective reality.

The introduction of computer science in primary schools with the aim to teach a growing person to think independently, develop imagination and practically realize their creative ideas, largely fills this gap. Computer science lessons and their difference from other lessons give children, not only pleasant moments of creative play, but also serve as a key to their own creativity.

The goal of learning computer science is the introduction and use of new advanced information technologies, awakening of desire to experiment in children, create and test hypotheses and learn from their own mistakes. Primary school students develop thinking and creative abilities.

### **Conclusion**

The modern period of society development is characterized by the strong influence of computer technologies, penetrating all spheres of human activity. An integral and important part of these processes is the informatization of education. Currently, there is a new system of education forming in Kazakhstan, focused on the entry into the international information and educational space.

In modern conditions a graduate must have knowledge in the fields of science and technology, which took shape in the form of scientific disciplines in recent years. First of all, computer science is the most dynamic of the school disciplines. In this regard, the achievement of computer literacy, which is closely associated with the user aspect of using computer, is not sufficient for the realization of educational functions of computer science. The aim of education

becomes the formation of student's information culture, the main component of which is operational, algorithmic style of thinking.

The operating style of thinking includes forming skills of planning, information search used in solving tasks, building information models, discipline of communication and messages structuring, instrumentation of all activities. The following main components of the operating style of thinking were distinguished:

- Ability to plan the structure of actions required to achieve a certain goal by using a fixed set of resources. This ability is often referred to as the ability to think algorithmically, although the term "structure of action" somewhat broader than the classical definition of the algorithm.

- Ability to build information models to describe objects and systems. A person using the accumulated data of machine systems, liberated from the description of the data structures must, however, always be aware of the used value ranks and their interrelationships. It is important to imagine the structure of information objects in a formalized manner. The value of this skill is increased due to the proliferation of integrated information systems,

- Ability to organize a search for information needed to solve the problem. The solution can only be effective when volume of information needed for its solution is correctly defined, and the search is properly organized.

- Discipline and structuring of communication language means is the ability to properly, accurately and clearly articulate the idea in an understandable form, and the other party should correctly understand the text message.

- Technical skills of interaction with computer.

Most experts agree on the need for implementation in primary schools the propaedeutic course of computer science starting with primary school or preschool. Expansion of the list of general learning skills of students is mainly due to the skills related to the use of information and communication technologies (ICT), which is reflected in the " Education Development Concept of the Republic of Kazakhstan till 2015."

According to this document it is planned to switch to a new model of secondary education with a 12-year course of study. The first stage is starting from the age of six. The content of education at this stage is completed earlier (from the beginning of schooling) with study of computer science fundamentals. Restrictions of age in early computer science education are now considered obsolete. They were based on the fact that for learning the basic concepts of computer science it is necessary to form the basic skills of working with information (reading information from the screen, writing, typing information into the computer). Today, computer graphics and animation are not rely on basic skills, but more than that, are used effectively during the development of basic skills in the first grade when working with graphical coloured moving objects on the screen.

In connection with the earlier study of computer science it is a real opportunity at an early stage of education to establish a process for the formation of general skills of ICT. This approach promotes purposeful preparation of

Almira IBASHOVA, Elmira ORAZBAYEVA, Altynay KALZHANOVA, Lyazzat  
BULETOVA, Asel YESNAZAR  
students to the systematic use of ICT in continuous individual study in a variety of  
educational, creative and practical activities.

*Formation Of Information Culture Of Primary School Students, Astra Salvensis, V (2017),  
no. 10, p. 229-241*