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## **FORMING OF THE INFORMATION CULTURE OF THE ADOLESCENTS WITH VISUAL IMPAIRMENTS**

### *Abstract*

The article is devoted to one of the complex educational issues, the problem of forming the information culture of the adolescents with visual impairments. The study clarified the structure and content of the concept of “information culture of the adolescent” as an integrative personal quality, which is a set of motivational, informational-content and operational-activity components that reflect the information motives of the teenager.

The structural and functional model of forming the information culture of the adolescents with visual impairments in an inclusive education institution has been developed, based on information, personal-activity, and individual approaches and principles (system-based, dynamism and flexibility, awareness of goals, individualization, feedback, activity, completion of training, reflection, involvement of the adolescent in the design of an individual educational trajectory), combines a set of motivational-target, content-activity and operational-activity stages of teaching. The model allowed us to consistently and holistically consider the natural connections between the individual components of the process under study: the content, the complex of pedagogical conditions, the activity of the teacher and the activity of the teenager, methods, forms, means, outcomes.

*Keywords:* culture, information culture, adolescents with visual impairments, inclusive education, the structural and functional model, information, personal-activity, and individual approaches, principles, methods, forms, means, pedagogical conditions, outcomes, experiment.

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## **КӨРУ ҚАБІЛЕТІ ЗАҚЫМДАЛҒАН ЖАСӨСПІРІМДЕРДІҢ АҚПАРАТТЫҚ МӘДЕНИЕТІН ҚАЛЫПТАСТЫРУ**

### *Аңдатпа*

Мақала күрделі білім беру проблемаларының бірі - көру қабілеті бұзылған жасөспірімдердің ақпараттық мәдениетін қалыптастыру мәселесіне арналған. Зерттеу барысында жасөспірімнің ақпараттық мотивтерін көрсететін мотивациялық, ақпараттық-мазмұнды және операциялық-белсенді компоненттердің жиынтығы болып табылатын интегративті жеке қасиет ретінде «жасөспірімнің ақпараттық мәдениеті» ұғымының құрылымы мен мазмұны нақтыланды.

Инклюзивті білім беру мекемесінде көру қабілеті бұзылған жасөспірімдердің ақпараттық мәдениетін қалыптастырудың құрылымдық-функционалдық моделі әзірленді, ол ақпараттық, жеке-белсенділік және жеке көзқарастар мен қағидаттарға (жүйелілік, динамизм және икемділік, мақсаттарды түсіну, даралау, кері байланыс, белсенділік, оқуды аяқтау, рефлексия, жасөспірімді жеке білім беру траекториясын жобалауға тарту), оқытудың мотивациялық-мақсатты, мазмұнды-белсенді және операциялық-белсенді кезеңдерінің жиынтығын біріктіреді. Модель бізге зерттелетін процестің жекелеген компоненттері: мазмұны, педагогикалық жағдайлар кешені, мұғалімнің қызметі мен жасөспірімнің қызметі, әдістері, формалары, құралдары, нәтижелері арасындағы табиғи байланыстарды дәйекті және тұтас қарастыруға мүмкіндік берді

*Түйін сөздер:* мәдениет, ақпараттық мәдениет, көру қабілеті бұзылған жасөспірімдер, инклюзивті білім, құрылымдық-функционалдық модель, ақпараттық, тұлғалық-белсенділік және жеке тәсілдер, принциптер, әдістер, нысандар, құралдар, педагогикалық жағдайлар, нәтижелер, эксперимент.

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## ФОРМИРОВАНИЕ ИНФОРМАЦИОННОЙ КУЛЬТУРЫ ПОДРОСТКОВ С НАРУШЕНИЕМ ЗРЕНИЯ

### Аннотация

Статья посвящена одной из сложных образовательных проблем - проблеме формирования информационной культуры подростков с нарушением зрения. В ходе исследования уточнена структура и содержание понятия «Информационная культура подростка» как интегративной личностной черты, представляющей собой совокупность мотивационных, информационно-содержательных и операционно-активных компонентов, отражающих информационные мотивы подростка.

В учреждении инклюзивного образования разработана структурно-функциональная модель формирования информационной культуры подростков с нарушением зрения, включающая информационные, личностно-деятельностные и личностные установки и принципы (системность, динамичность и гибкость, понимание целей, индивидуализация, обратная связь, активность, завершение обучения, рефлексия, вовлечение подростка в проектирование индивидуальной образовательной траектории), объединяет совокупность мотивационно-целевых, содержательно-активных и операционно-активных этапов. Модель позволила последовательно и целостно рассмотреть естественные связи между отдельными компонентами изучаемого процесса: содержанием, комплексом педагогических условий, деятельностью учителя и деятельностью подростка, методами, формами, средствами, результатами.

*Ключевые слова:* культура, информационная культура, подростки с нарушением зрения, инклюзивное образование, структурно-функциональная модель, информационные, личностно-деятельностные и личностные подходы, принципы, методы, формы, средства, педагогические условия, результаты, эксперимент.

**Introduction.** Dynamic socio-cultural changes taking place in modern society are characterized by rapid scientific and technological progress, global informatization, and the formation of a new type of socio-economic formation—a post-industrial “information” or “open” society. The national doctrine of education in Kazakhstan formulates goals and objectives, including: ensuring the versatile and timely development of children and youth, their creative abilities, formation of self-education skills, self-realization of the individual; training highly educated people and highly qualified specialists capable of professional growth and professional mobility in the conditions of Informatization of society and the development of new knowledge-intensive technologies. The search for innovative mechanisms for the forming of information

culture of the individual in new socio-cultural conditions is of fundamental importance for pedagogical science and practice.

Currently, to the study of the information culture is most often used by the information approach in which this concept is considered in the context of skills of self-building knowledge in demand of everyday life [1; 2].

Particularly relevant is the formation of information culture in adolescence, when “internal processes begin to develop that lead at the end of adolescence to the formation of relatively independent and stable views, assessments, a relatively stable system of attitude to the world and to oneself” [3].

Institutions with inclusive education for children, as an independent educational structure of general education, are characterized

by openness, mobility, flexibility, and the ability to respond promptly to the needs and demands of the child and society as a whole. The essential indicator of institutions of inclusive education of children is the pedagogical technologies of self-development of a person that contribute to his further effective self-realization in society, full participation in everyday, social and professional fields of activity in the information society [4].

Fundamental to our research are the works that allow us to reveal the content and structure of the concept of “information culture”.

Theoretical analysis allows us to note that in the psychological and pedagogical science, the concept of “information culture” is considered by scientists as:

- a part of the general culture of society, designed to provide the essential meanings of the person, the ability to perceive and transform the world around himself [5]; the level of development of society, the level of development of specific societies, nations, as well as spheres of activity;

- the field of culture associated with the functioning of the information society and the formation of informational qualities of a person [6];

- set of rules for human behavior in the information society [7]; qualitative characteristics of human activity in the field of receiving, transmitting, storing and using information in the context of universal values [8]; the degree of perfection of the person, society or a certain part of it in all possible types of work with information [9].

For all the significance of the research, the problem the formation of information culture of a teenager is one of the insufficiently developed problems, which determines its relevance and the need to develop scientific and methodological support that ensures the effectiveness of its solution.

The relevance of the research is due to the need to resolve contradictions between:

- the objective need of society for a person with an information culture and insufficient development of theoretical and methodological foundations for the formation of information culture in adolescents with visual impairment;

- the need for educational practice in

scientific and methodological support in the process of forming of information culture of adolescents in institutions with inclusive education of children and insufficient development of the content, methods, forms and means of teaching.

The revealed contradictions allowed us to formulate the problem of research, which consists in the search for and scientific justification of the content, methods, forms and means of forming an information culture of adolescents with visual impairment [10].

Relevance, social significance, insufficient theoretical and practical development of the problem under consideration allowed us to determine the topic of the dissertation research: “Forming of information culture of adolescents with visual impairment”.

**The purpose of the article:** Theoretical and methodological substantiation of the model for the formation of information culture of adolescents with visual impairment.

The purpose of the study determined the need to set and solve the following objectives:

- to clarify the structure and content of the concept of “information culture of the adolescents”;

- to develop pedagogical conditions for the implementation of a model for the formation of information culture of the adolescents with visual impairment.

**Material and methods.** Clarifying the concept of “information culture of an adolescent” requires identifying its content and structure. Let’s consider the basic concepts of our research: “culture”, “information culture”.

The word “culture” comes from the Latin word *colere*, which means to cultivate the soil. “Cultural” means artificially created, invented and worked by people, unlike the one given by nature, formed naturally, without human intervention. The concept of “culture” first began to be used in antiquity, but at that time it did not yet have the status of science, meaning a purposeful impact on nature, as well as the upbringing and education of the person himself.

The concept of “culture” is ambiguously defined depending on the scientific discipline within which such an attempt is made.

Culture studies uses the concept of culture, which reveals the essence of human existence as the realization of creativity and freedom. It is culture that distinguishes a human being from all other beings [11]. Culture defines itself - in the process of internal interaction of its elements, properties, patterns, norms and values, etc. This interaction is carried out simultaneously “horizontally” (in space) and “vertically” (in time). From the point of view of the cultural approach, the following main characteristics of culture can be distinguished:

- Culture is a meaningful content of people’s joint life.
- Culture is biologically non-inherited information, a world of artificially created phenomena.
- Culture contains images of human relations: ways of perception, feeling, thinking, behavior, and expression in a symbolic form.
- Within the framework of culture, technologies are formed: social interaction, material objects, generation and translation of symbols, etc.

The cultural approach is characterized by integrativity, interdisciplinarity, attempts to study culture as a single system and a special class of phenomena. Culturological explanation is based on knowledge and observations obtained in the framework of ethnographic and anthropological field research, and is based on the fact that people’s behavior is determined by external cultural tradition [12].

The founder of English anthropology E. B. Tylor (1989) understood culture as “that complex whole which includes knowledge, belief, art, morals, law, custom and any other capabilities and habits acquired by man as a member of society” [14].

Philosophers distinguish four main aspects of “culture” interpretation [16]:

- abstract designation of the general process of intellectual, spiritual, and aesthetic development;
- denoting a state of society based on law, order of morals mildness, etc.; in this sense, the word “culture” coincides with one of the meanings of the word “civilization”;
- an abstract indication of the peculiarities

of the way of existence or way of life peculiar to a certain society, a certain group of people, or a certain historical period;

- abstract designation of forms and products of intellectual, and, above all, artistic activity (this is the meaning of the word “culture” has become most widespread).

Within the framework of sociology, the structure and functioning of culture in connection with social structures and institutions are studied. The assimilation of culture is carried out by means of learning. Culture is created, culture is taught. Since it is not acquired biologically, each generation reproduces it and passes it on to the next generation. This process is the basis of socialization. If the process of socialization stopped on a mass scale, it would lead to the death of culture. Culture shapes the personalities of members of society, and thus it largely regulates their behavior. The modern scientific definition of culture symbolizes beliefs, values, and expressions (used in literature and art) that are shared by a group; they serve to organize the experience and regulate the behavior of members of this group. A. S. Karmin (1997) states that “culture is social information that is preserved and accumulated in society by means of symbolic means created by people” [16, p. 42];

Based on the above, it can be argued that the concept of “culture”, capacious and ambiguous, is used in a broad and narrow sense. In a broad sense, it is everything that is created by humanity, its physical and intellectual efforts. In a narrow sense, this is a special state of society. Currently, there are about five hundred definitions of the concept “culture”.

Since the modern stage of human development is characterized by the formation of an information society, social reality imposes new requirements on the personality in such a society, which are expressed in the need to form a new personal quality - information culture. “Information culture of the individual - a set of rules of human behavior in the information society, ways and norms of communication with artificial intelligence systems, conducting a dialogue in human-machine systems “hybrid intelligence”, use of telematics tools, global and

local information and computing networks. It includes the ability of a person to understand and master the information picture of the world as a system of symbols and signs, direct and reverse information links, freely navigate the information society, adapt to it" [17].

In the context of the multidimensional concept of "culture", the modern definitions of the category "information culture" are also ambiguous. Analyzing the definitions of information culture, B.C. Tsymbalyuk (2003) reveals the multiplicity of this concept, considering it in different planes of the system of public relations, according to a subjective criterion, noting:

- information culture of the individual;
- corporate information culture (of various social organizations);
- information culture of society and the state (represented by their bodies);
- information culture of civilizations.

By objective criteria:

- as a sphere of public relations;
- as the inter-industry Institute for information law;
- as a scientific discipline;
- as an academic discipline;
- as an organizational and managerial category [15].

In modern studies of information culture (I. Yu. Efimova, E. G. Izarova, etc.), the information approach prevails, since this problem came to science from the information sphere. Within the framework of the information approach, most definitions of information culture imply a set of knowledge, skills, search, selection, analysis of information, that is included in information activities aimed at meeting information needs.

From the positions of the indicated approaches, a broad understanding of information culture is associated with the essence, functions, and criteria of human culture, while a narrow one is aimed at identifying various facets of the information culture of the personality. The literature review has allowed us to identify the following views of scientists on the concept of "information culture":

- Information culture is a necessary and important part of the general culture (V. A.

Ukhanov considers information culture to be a necessary and important part of the general culture: general culture is designed to provide a person with the ability to perceive and transform the world and himself, it forms and implements the essential meanings of a person, and information culture serves as a condition that ensures this perception, a prerequisite for the distribution of all the wealth of material and spiritual culture [5, p. 6-18]; M. G. Vokhrysheva understands information culture as "an area of culture associated with the functioning of the information society and the formation of information qualities of the personality" [9, p. 18]; "a set of rules for human behavior in the information society, in human-machine systems that fit into the world humanistic culture of man" [8, p. 6].

- information culture as a level of development of society, personality (T.N.Sosnina, P.N. Gonchukov: "information culture characterizes the levels of development of specific societies, nationalities as well as spheres of activity. It is a product of his creative abilities, acts as the content side of subject-subject and object-object relations registered with the help of various material carriers". I. G. Khangeldieva (1993) considers information culture as "qualitative characteristics of human activity in the field of receiving, transmitting, storing and using information, where the priority is universal spiritual values [11, p. 23-30]; E. L. Semenyuk (1994) gives the following definition of information culture - it is "the degree of perfection of a person, society or a certain part of it in all possible types of work with information: its receipt, accumulation, encoding and processing of any kind, in creating on this basis qualitatively new information, its transfer and practical use" [12, p. 9];

- in pedagogy, ideas about information culture are actively developed in the context of considering the information culture of the individual (E. G. Izarova): "a system of ideas about the information picture of the world, skills in the field of information and communication technologies and knowledge of legal and moral and ethical norms of behavior in the information space, ensuring the optimal implementation of

individual and collective information activities, both in the professional sphere and in everyday life” [2, p. 9]; I. Yu. Efimova (2003) considers the information culture of a child as a dynamic quality of personality that characterizes its readiness for information activities and emphasizes that information culture has a system structure, in which it is possible to distinguish a system-forming core or factor. It is the information activity of students, due to the nature of their educational and cognitive activities. This activity, in accordance with the needs of students, manifests itself in the use of information resources accumulated by them and society, clarifies the content of the concept of “information culture of senior school students” by introducing such characteristics as “integrative quality of personality”, “readiness of the subject to use individual and General cultural knowledge in information activities” [4].

A.V. Petrushchenkov [17] identifies three blocks in the information culture of the individual:

- a system of qualities that characterize a person (be able to add knowledge, find and process information, have a high level of overall development, have professionally significant qualities);

- content block (to have the necessary minimum of psychological and pedagogical knowledge about a person, to know the principles of working on a computer, to have the ability to master new knowledge, types and forms of activity, to know the psychology of communication in the real and virtual world, to be ready for collective activity);

- operation block - (ability to work with software, have information processing skills, the ability to navigate the information environment, analyze and highlight the main information, creatively to process the information, the ability to evaluate their actions in terms of their adequacy and effectiveness).

There are other models of information culture. Information culture of the individual is usually considered in the context of skills and abilities for self-development of professional and any other knowledge required by everyday

life. In other words, the concept of “information culture” includes many components:

- the culture of searching for new information when the individual understands that the elimination of information deficit is always associated with significant psychological difficulties;

- culture of reading and perception of information and the need to analyze the entire “documentary trail” of the studied direction;

- awareness of the fact that any professional reading is a means of gaining knowledge;

- skill to process large amounts of information;

- skill to generate own database software and maintain personal search engines;

- understanding the importance of interpersonal professional communication for the success of any work activity;

- striving to improve the level of communicative competence;

- nurturing tolerance of other people’s points of view and opinions, a willingness not only to receive, but also to give knowledge;

- skill to find partners for joint activities using telecommunications channels;

- skill to clearly and evidently present the results of their own activities, including taking into account the level of preparedness and mood of the target audience;

- knowledge of the rules governing the use of intellectual property.

Thus, the first stage of mastering information culture can be considered when a person:

- has an understanding of information and information processes, the structure of the computer and its software;

- it is able to enter information with sufficient speed using the keyboard and work with the graphical interface of programs using the mouse;

- can use information modeling to solve problems using a computer;

- can create and edit documents, including multimedia presentations;

- can process numeric information using spreadsheets;

- can use databases for saving and searching information;

- can use information resources of a computer network;
- knows and does not violate copyright laws on computer programs;
- adheres to ethical standards when publishing information on the Internet, as well as in the process of communication via the Internet [16].

It should be noted that the content of the concept of “information culture” most accurately reflects the interaction of an individual with the surrounding information environment and information space. This concept includes not only the ability to work correctly on the computer, on the Internet, in corporate networks, but also all other aspects of the multifaceted concept of “culture”, adapted to the information society, that is, knowledge and skills in the field of information technology, knowledge of legal and ethical standards in this area [18].

Adolescence is a transition from childhood to adulthood and covers the period of human life from 10-11 to 13-15 years. At this age, internal factors of development that define a new type of relationship between the child and the environment begin to become increasingly important: he becomes capable of independent development through self-education and self-improvement. In this regard, the formation of information culture is particularly relevant in adolescence, since, as a basis for self-realization, self-knowledge and self-development, information culture helps to meet the need for the implementation of physical and mental forces associated with the growth of self-awareness, intensive development of the surrounding social environment.

New information technologies offer unlimited opportunities for personal development. However, the uncontrolled passion of teenagers for the Internet and computer games can have negative consequences for the development of a teenager’s personality. The psychological consequences of using information technology are ambivalent. On the one hand, there can be specified a large number of positive influences on Internet users in connection with the type of activity in it. Thus, cognitive activity on the Internet, search for information by keywords

will allow any user to find a lot of materials on the issue of interest, get acquainted with different points of view on this problem, and stimulate their own activity and creativity. Communication activities on the Internet can contribute to the emergence of motivation for mastering writing skills in children, learn new forms and peculiar rules of communication. Other positive effects of mediated communication include the intensification of foreign language learning and the actualization of cultural and geographical knowledge. Speaking about the positive aspects of computer games, it should be noted that they can perform the function of psychological unloading, play the role of a kind of psychological training, generally representing a socially acceptable type of symbolic experience important for the development of the personality [21].

However, negative effects are added to all the positive effects of the use of IT. So, navigation on the Internet (connected with any type of activity-cognitive, gaming, communication), can contribute to a kind of departure from reality, the emergence of a syndrome of dependence on the Internet, in which the navigation process “drags” the child so that he is not able to fully function in the real world. In a more global sense, we can talk about the possibility of autism of IT users when they are interested in “modeling” or “playing” various situations using a computer. IT contributes to the care of children and adolescents from reality. In addition, in children with vision problems, a constant stay at the computer can worsen the state of health.

Based on the studied theoretical positions, we offer the following definition of the basic concept of “*information culture of the adolescent*” for our research.

*Information culture of the adolescent is an integrative personal quality, which is a set of information motives, knowledge and skills of information activities related to the consumption and creation of information resources to ensure creative self-realization in education, daily life and future professional activities in the information society.*

Theoretical analysis allows us to identify the main criteria of information culture of

the adolescent: the presence of motives for information activities; theoretical knowledge in the field of information technology; knowledge and skills in the use of IT.

The structure of information culture of

the adolescent in our study is represented by motivational, informational-content and operational-activity components that have a level nature of manifestation - creative, reproductive or critical (Table 1.).

Creative level	Reproductive level	Critical level
<b>Motivational component</b>		
<b>Criteria:</b> motives of information activities (for obtaining additional knowledge; for leisure and personal development; for professional self-determination and adaptation to life in the information society)		
<b>Level indicators</b>		
Motives are stable	Motives are unstable	Motives are poorly expressed or absent
<b>Informational-content component</b>		
<b>Criteria:</b> theoretical knowledge (about the information picture of the world and information search systems; knowledge in the field of information technologies for leisure and personal development; knowledge of the possibilities of using information technologies in the intended professional activity).		
<b>Level indicators</b>		
Theoretical knowledge system, deep, correlated with their own information motives.	Theoretical knowledge is systemic, but not always solid, not always correlated with its own informational motives.	Theoretical knowledge is haphazard, sketchy, fragmentary, lack of depth and strength.
<b>Operational-activity component</b>		
<b>Criteria:</b> practical skills (search, selection and processing of information for additional knowledge; creative use of IT for leisure and personal development; use of IT in the intended professional activity).		
<b>Level indicators</b>		
Purposeful nature of information activity, stable skills of IT in the intended professional activity, creative self-realization in education and everyday life.	The nature of the activity is not sufficiently conscious, skills are not always stable, and creative initiative is almost absent.	The nature of the activity is reproductive, skills are unstable (often absent), and creative initiative is not shown.

Table 1. *Criteria and level indicators of components of the information culture of the adolescents*

**Results and findings.** The purpose of this article is to develop a structural and functional model for the formation of information culture of the adolescents with visual impairment.

Structural and functional model for the formation of information culture of the adolescents with visual impairment meets the following criteria:

- connection or integrity, which involves the limitations of the study highlighting significant dependencies between objective areas;
- constantity, or stability, which main features are reproducibility and technology;
- observability, i.e. the need to link the key points of the theoretical model with real effects that can be recorded in the object under study;
- visibility - including the minimum, visible number of parameters in the model.

Thus, the structural and functional model of forming the information culture of adolescents with visual impairment - this is a certain sequence of stages in the process of forming the information culture of the adolescents, which provides quantitative and qualitative changes in personality properties, moreover, the transition from one stage to another is carried out due to the complexity of the goals of the stages and the means used for personal development.

The structural and functional model of forming the information culture of the adolescents with visual impairment, developed by us as a result of theoretical research, combines a set of motivational-target, content-activity and operational-activity stages that provide the structural content of the process under study and its functional implementation, reflects the gradual nature of interaction between a teacher



and a teenager and describes the features of his development, allows you to most effectively manage the process of forming the information culture of a teenager and predict its outcome (Table 2).

<b>The goal</b> is to form the information culture of the adolescents with visual impairment		
<b>Scientific approaches:</b> information, personal-activity, individual.		
<b>Principles:</b> system-based, dynamism and flexibility, awareness of goals, individualization, feedback, activity, completion of training, reflection, involvement of the adolescent in the design of an individual educational trajectory.		
<b>Content:</b> modular IT curriculum		
<b>Stages</b> <b>for the formation of information culture of the adolescents with visual impairment</b>		
Motivational-target	Content-activity	Operational-activity
<b>The activities of the adolescents</b>		
<b>Information-cognitive</b>	<b>Information-practical</b>	<b>Creative</b>
<b>Activating the motivation of the adolescent master IT</b>	<b>forming knowledge, habits and skills of the adolescent</b>	<b>stimulating creative activity of the adolescent</b>
<b>The activity of the teacher</b>		
<b>Methods</b> (presentations, demonstrations, electronic textbooks, creativity);		
<b>Forms</b> (lectures, practical classes, independent activities);		
<b>Means of teaching</b> (information and pedagogical technologies, textbooks).		
<b>PEDAGOGICAL CONDITIONS</b> <b>for the implementation of the model for the formation of information culture of the adolescents with visual impairment</b>		
1. Optimization of the information and educational environment for the formation of information culture of the adolescents with visual impairment;		
2. Introduction of a modular and variable component of educational content into the educational process;		
3. Ensuring the teacher's readiness to form an information culture of the adolescents.		
<b>Learning outcome:</b> formation of the information culture of the adolescents with visual impairment.		
<b>Components:</b> motivational, informational-content, operational-activity.		
<b>Criteria:</b> motives of information activity; theoretical knowledge in the field of IT; practical skills and skills of information activity.		

Table 2. *The structural and functional model for the formation of information culture of the adolescents with visual impairment*

The main conceptual provisions are represented by a set of scientific approaches (information, personal-activity, individual) and principles (system-based, dynamism and flexibility, awareness of goals, individualization, feedback, activity, completion of training, reflection, involvement of the adolescent in the design of an individual educational trajectory).

*The information approach* is based on understanding the role and significance of information for life and self-realization in the information society. Kazakhstan has local experience in applying the ICF classification in the healthcare system, as well as in conducting medical and social expertise [23]. Within the framework of the information approach, most definitions of information culture imply a set of knowledge, skills and abilities for searching, selecting, analyzing information, that is included in information activities aimed at meeting the information needs of students [2;4].

The personal-activity approach assumes not passive behavior of a teenager in the process of forming an information culture, but its inclusion in activities. The activity of the adolescents with visual impairment changes depending on the means and methods used by the teacher, on the stage of formation of information culture. Types of activity of the adolescents in the process of forming their information culture: information-educational, information-practical, creative. The type of activity of the adolescents and the level of formation of components of information culture are mutually determined.

*The individual approach* allows to take into account the different level of initial computer training of teenagers, as well as the difference in age, health and psychological states, information motives and abilities of adolescents. The individual approach helps to ensure the optimal rate of progress for

each adolescent with visual impairment in the program, individual consultations, creative tasks, as well as the ability to choose own educational trajectory through modular and variable training.

The process of forming the information culture of a teenager is presented by us in the structural and functional model (Table 1) in three stages: *motivational-target, informational-content and operational-activity*. Each stage of the formation of information culture of a teenager contains target parameters that allow us to present the studied process as a complete, systematic.

*Motivational-target stage.* The starting point of the motivational-target stage is the goal, which is specified by the tasks of the teacher and the teenager. The main objective of the first stage of formation of information culture of the adolescents with visual impairment: to strengthen the adolescent motivation in mastering the new information technologies; to generate knowledge and elementary skills for study programs, including the knowledge and skills to independently obtain information using IT. At this stage, the motivational component of the information culture of an adolescent is mainly actively formed, and the information and content component begins to form.

*Content-activity stage.* At this stage, the conditions for the formation of an information culture of a teenager are expanded, depending on the knowledge, skills and abilities obtained. An individual approach contributes to the choice of an individual program by a teenager, correction of an individual program by a teacher together with a teenager, depending on the interests of the teenager, his abilities and capabilities, personal experience, and the level of claims. The main task of the second stage is to form stable knowledge, skills and abilities. Two components are actively formed: motivational and information-content. The operational and activity component begins to form.

*Creative stage.* The task of the creative stage is to stimulate the creative activity of a teenager in joint activities. At this stage, the nature of the activity changes qualitatively. This is a stage of self-development of new knowledge.

The educational goal here is focused not on the transfer of information from the teacher to the pupil, but on teaching the adolescent to independently seek and find knowledge that already acts as a means and material of work on the development of the teenager. A lot of time is devoted to performing non-traditional tasks outside of the existing knowledge, independent research work. At this stage, the integration of knowledge, skills and abilities obtained by students on the theoretical basis of subjects. The type of teaching is innovative and productive, the model of teaching is search-based, and the type of knowledge acquisition is independent. The stage of personal development is intellectual search; the level of experience acquisition is heuristic. By the end of the learning process, the content and forms of education become creative, rather than reproductive. The adolescent himself designs and performs the task based on his creative abilities. At this stage, the internal motivation of an adolescent to master new information technologies increases, providing fundamentally new opportunities for creating and editing images, conditions are created for the realization of his creative potential. This stage contributes to the active formation of all three components of the information culture of an adolescent: motivational, content-activity, operational-activity.

*The outcome* of the implementation of the designed model is the formation of the information culture of the adolescent.

Having clarified the methodological foundations and justified the structural and functional model of the formation of information culture of an adolescent, we will begin to design a system of teaching means necessary for the transition from the critical to the creative level of information culture.

In the process of forming the information culture of an adolescent with visual impairment, the following system of teaching means is used:

- computer maintenance;
- application software packages - subject of study;
- declarative means are printed materials that are presented both on paper and in the form of regular computer files.

– the didactic potential of these components of the educational-methodical complex is the initial acquaintance with the educational material;

– ICT: electronic textbooks, reference systems, test computer systems, the main didactic functions: familiarization, understanding, consolidation and assessment.

Theoretical research and practice confirm that the effective implementation of the process of forming the information culture of an adolescent with visual impairment is provided by pedagogical conditions.

A *pedagogical condition* is an external circumstance, a factor that has a significant impact on the course of the pedagogical process, to some extent consciously constructed by the teacher, suggesting, but not guaranteeing a certain result of the process [17].

The effectiveness of forming an information culture of an adolescent with visual impairment will depend on the choice of the necessary conditions, which is the main task of our research. Let's take a closer look at each of the pedagogical conditions we have identified:

1. *Optimization of the information and educational environment for the formation of information culture of the adolescents with visual impairment.*

The information and educational environment is understood as a system-organized set of information, technical, educational and methodological support that is inextricably linked with a person as a subject of the educational process.

The main functions of the information and educational environment that are important for our research:

– *information* (provides access to information resources, the ability to receive and use information for personal development, career guidance, etc.);

– *communicative* (the possibility of mutually enriching communication with other people - both traditional and via the Internet);

– *developing* (contributes to the development of information culture of the adolescents);

– *educating* (helps to develop skills of working with IT and their application in specific activities);

– *diagnostic* (aimed at identifying the level of formation of the information culture of the adolescents - tests, self-diagnosis cards, etc.);

– *reflexive* (aimed at developing the skills of a teenager to apply the acquired knowledge, skills and abilities, as well as personal qualities in their specific activities, creative self-realization, professional self-determination).

Optimization of the information and educational environment for the formation of information culture of the adolescents with visual impairment assumes: rational planning of the content of teaching; stimulating positive motivation of a teenager in the formation of information culture; the choice of forms and methods of training that allow to most successfully solve the tasks in the allotted time; choosing the optimal means of forming an information culture; analysis of results in terms of optimality criteria.

The main stages of optimizing the information and educational environment for the formation of information culture of a teenager:

– ensuring full compliance of the content with the tasks of forming the adolescents' information culture;

– the selection in the content of the main essential;

– cross-subject content coordination;

– ensuring that the volume of content corresponds to the time allotted for studying it;

– the process of differentiation in forming of information culture of the adolescents;

– development of a scheme for the rational application of methods for forming the information culture of the adolescents.

Thus, the information and educational environment is a system-organized set of means of data transmission, information resources, interaction protocols, hardware, software and methodological support aimed at forming the information culture of a teenager, including: information resources - the content of teaching; a block of computer programs integrated into a common educational and methodological complex; a local computer network; the Internet.

2. *Introduction of a modular and variable component of educational content into the educational process.*

The main means of modular training is a modular program or module. Some authors understand the module as an independent section (topic), which deals with one or a group of basic fundamental concepts of the discipline; others believe that the teaching module is an integration of various forms and types of teaching related to a common problem (topic).

The module can be presented as a teaching element in the form of a standardized booklet consisting of the following components:

- a well-defined learning goal;
- list of necessary equipment, materials, and tools;
- a list of related teaching elements; the actual teaching material in the form of a short concrete text accompanied by detailed illustrations;
- practical classes to develop the necessary skills related to this teaching element;
- a test that strictly corresponds to the goals set in this teaching element.

Organization of the process of formation of information culture of a teenager on a modular basis allows:

- implement the integration and differentiation of the teaching content in dialectical unity by grouping modules of educational material that provide the development of the course in full, abbreviated and in-depth versions, which helps to solve the problem of level and profile differentiation in the educational and developmental process;
- make each teenager an independent choice of one or another version of the modular program, depending on the level of knowledge, skills of information activities, information motives and interests, and provide an individual pace of progress in the program;
- to shift the emphasis in the work of a teacher to the advisory and coordinating function of managing the cognitive activity of a teenager in order to form their information culture;
- reduce the course on the basis of an adequate set of methods and forms of teaching without much damage to the completeness of the presentation and the depth of acquisition of the teaching material.

In general, researchers estimate that modular teaching can reduce the time of the training course by 30%. The free time can be used for creativity, in-depth self-study of the teenager's favorite features of programs selected for the main study, or for introductory study of programs not selected for the main study.

3. *Ensuring the teacher's readiness to form an information culture of the adolescents.*

The goal of the teacher is to teach teenagers to use information technologies to independently acquire knowledge, skills and abilities, as well as to teach them to apply the knowledge, skills for personal development and self-realization in their studies, daily life and intended professional activities. A prerequisite for the formation of the adolescent's information culture is to ensure that the teacher is ready for this process.

The need to organize special training of teachers is confirmed by the results of self-assessment of teachers: the level of their readiness to form an information culture of the adolescents with visual impairment is defined as superficial. This is how more than 90% of the teachers surveyed assessed their level of information culture. At the same time, the absolute majority of respondents are convinced of the need to deploy special training of teachers to form an information culture of adolescents.

The achievement of this research goal involves conducting a specific study of the dynamics of level indicators of information culture of adolescents in the practical implementation of the model developed by us, provided by a set of pedagogical conditions.

During the research, we used a set of methods of scientific and pedagogical research. At the first stage of the study, theoretical analysis, observation, and questionnaires were used. At the experimental stage of the study, we used self-assessment questionnaires, interviews, practical and theoretical testing, and statistical data processing.

*The forming stage of the experiment* was carried out in two groups (experimental and control), divided into subgroups. In the experimental group, classes were conducted according to the developed structural and functional model, in the control group –

traditionally. Diagnostic tests were carried out at all stages, which made it possible to track the dynamics of the development of components of the information culture of adolescents. For this purpose, a self-assessment map of the components of the information culture of a teenager was developed. Each of the components of the information culture (motivational, informational-content, operational-activity) corresponded to three questions (criteria) of the self-assessment map. The survey was conducted on a seven-point scale, with teenagers choosing a score that characterizes the severity of the statement. Since the self-assessment map was used in the system with other diagnostic tools (regular current control of

theoretical knowledge and practical skills using the developed test system, success criteria, pedagogical observation), there is reason to believe that the data obtained using it is reliable.

We considered the level of information culture formation below 3 to be critical, from 3 to 5 – reproductive, and above 5 – creative. At the beginning of the experiment, the average indicator of the information culture of adolescents in both groups – experimental and control – differed slightly and did not exceed 4 points. During the experiment, the level of forming of information culture components in adolescents of the experimental group increased more significantly than in adolescents of the control group (Table 3).

The components of information culture	Criteria	Zero test		Intermediate test		Final test	
		EG	CG	EG	CG	EG	CG
Motivational (motivation for the use of information technology (IT))	In order to obtain additional knowledge	2,5	3,3	4,7	4,1	6,1	4,6
	For the purposes of personal development	3,7	3,2	4,9	4,1	6,6	4,5
	For professional self-determination and adaptation to life in the information society	4,1	3,7	4,9	4,1	6,0	4,5
Informational and content (theoretical knowledge)	About the information picture of the world, about information search systems	3,7	3,6	4,6	4,2	5,2	4,6
	About using IT for personal development	3,8	3,9	4,8	4,4	5,0	4,6
	About the use of IT in the proposed professional activity	3,7	3,8	4,7	3,9	5,1	4,7
Operational and activity (skills)	Search, selection and processing of information to obtain additional knowledge	3,7	3,6	4,1	3,8	5,0	4,6
	Creative use of IT for personal development	4,3	4,0	4,4	4,1	5,4	4,8
	Use of IT in the intended professional activities	3,5	3,6	3,8	3,7	5,2	4,5

Table 3. Dynamics of forming the components of information culture of the adolescents of experimental and control groups (points)

EG – experimental group

CG – control group

Analyzing the data obtained, it can be stated that the formation of the motivational component of information culture occurred mostly at the first, motivational-target stage of the forming experiment and at the second, content-activity stage. The information-content component of the information culture

of adolescents was formed more intensively in the experimental group, starting from the first stage of the experiment. The operational-activity component of the information culture of teenagers was formed, for the most part, at the third, creative stage.

It was found that the average score of the formation of information culture of adolescents

in the experimental and control groups at the beginning of the forming experiment differ slightly.

The dynamics of growth in the formation of information culture components, as well as the overall formation of information culture in the experimental group at the end of the experiment is higher than in the control group. In the experimental group, where the identified pedagogical conditions were met, the indicators of forming the components of information culture of adolescents by the end of teaching are significantly higher than in the control group. In general, we can judge that at the end of the formative experiment, the average level of information culture formation in adolescents of the experimental group is higher than in adolescents of the control group. In addition, the positive shift in the level indicators of information culture formation in adolescents of the experimental group is higher than in adolescents of the control group.

Analysis of dynamics of changes in the level of forming the components of information culture of adolescents with visual impairment in the experimental and control groups allows us to conclude that the structural and functional model of formation of information culture of adolescents under the identified pedagogical conditions is effectively implemented.

**Conclusion.** In the context of global informatization, the transition to a new educational paradigm is actualized, one of the priorities of which is the formation of an information culture of the individual. Especially relevant is the formation of information culture in adolescence, when there is a formation of relatively independent and stable views, assessments, relatively stable system of attitude to the world and to oneself. The information culture of the adolescents with visual impairment is a necessary personal quality for adaptation to life in an information society.

Our theoretical research and experimental work have shown that a large number of issues in this direction need to be theoretically understood, and new ways and means of activating the process of forming the information culture of the adolescents with visual impairment are needed to make it more effective.

Thus, our research was aimed at solving the problem of forming an information culture of the adolescents with visual impairment. In the course of theoretical analysis, the content and structure of the information culture of the teenager were revealed.

Information culture of the adolescent is an integrative personal quality, which is a set of information motives, knowledge and skills of information activities related to the consumption and creation of information resources to ensure creative self-realization in education, daily life and future professional activities in the information society.

In our study, the structure of information culture of the adolescent is represented by motivational, informational-content, operational-activity components that have a level character of manifestation - creative, reproductive or critical. The main criteria of information culture of the adolescent: the presence of motives for information activities; the presence of theoretical knowledge in the field of information technology; the presence of skills and application of information technology.

The institution of inclusive education for children is defined as a space for receiving multi-level education, as a link in the chain of continuing education, complementing, and not replacing general education; it is based on a student-centered approach aimed at the development of the individual in order to successfully adapt it to the modern information society[23].

The study on the basis of theoretical analysis revealed, the information-pedagogical potential of the institution of inclusive education of children in the formation of information culture of the teenager, representing the reserve educational space of the institution is revealed through the treatment to the subject, maximal individualization of educational process due to the use of information and pedagogical technologies, openness and subjectivity of the content of education, focus on the personal development of the teenager, his pre-professional training and adaptation to life in the information society.

For effective formation of the information culture of the adolescents with visual impairment, we turned to modeling.

The developed structural and functional model of forming the information culture of the adolescents with visual impairment, the main conceptual provisions of which are represented by a set of scientific approaches (information, personal-activity, individual) and principles (system-based, dynamism and flexibility, awareness of goals, individualization, feedback, activity, completion of training, reflection, involvement of the adolescent in the design of an individual educational trajectory), combines a set of motivational-target, content-activity and operational-activity stages that ensure the structural content of the process under study and its functional implementation, provides a

stage-by-stage change in the components of the information culture of the teenager in the unity of the goal and outcome, allows to effectively manage the process of forming the information culture of the adolescents with visual impairment and predict the result.

The experiment showed that efficiency of realization of structurally-functional model of forming the information culture of the adolescents by providing a complex of pedagogical conditions (optimization of the information and educational environment for the formation of information culture of the adolescents with visual impairment; introduction of a modular and variable component of educational content into the educational process; ensuring the teacher's readiness to form an information culture of the adolescents).

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