INFORMATION AND INNOVATIVE TECHNOLOGIES IN THE TURBULENCE ERA

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PREFACE

The development of information technologies and the widespread use of information resources, which are the result of the intellectual activity of the most educated part of society, have determined the necessity to create a framework for their successful use. That is why the development of certain methodological approaches to the use of new information technologies for the implementation of ideas in education, economics and management is currently relevant. It is these issues that the monograph, “Information and Innovative Technologies in the Turbulence Era” is devoted to.

The value of information and the sharing of information services continues to grow on a daily basis in our world. It can arguably be said that the primary role in the process of informatization is played by the information itself, which by itself does not produce any material value. Information is factual data and the body of knowledge concerning the relationship between said data: i.e. a means by which society can be aware of itself and function as a whole. Information must be both empirically verifiable and accessible so it can be received, understood and assimilated. The data taken from the information must be significant and correspond with the latest scientific parameters.

The monograph "Information and innovation technologies in the era of turbulence" consists of two parts: "Contemporary information and innovative technologies in education in times of turbulence" and "Modern technologies in the economy and management in conditions of turbulence".

The works presented in the first part of the monograph deal with several problems; teaching people of various ages, developing their creative potential, developing the ability to predict the results of activities and developing a strategy for solving problems, both educational and practical. Issues related to the fields of psychological, pedagogical and methodological developments aimed at identifying the optimal conditions for using the means of new information technologies in order to fortify the educational process while also considering an increase in both efficiency and quality.

The articles contained in the second part of the monograph relate to the possibilities of implementing the technical and software tools of modern information technologies in economics and management. The benefits of this allow ensuring the management of information flows, communication with the user in natural language, recognition and classification of images and situations, the effective development of the logic and argumentation of evidence, the accumulation and use of relevant knowledge, the organization of various forms of activities, making independent discoveries, etc.

Information and innovative technologies in the economy and management stimulate the development of business, local economies and start-ups. They offer new financial products and services and change the way people live. The problems of modern innovation management, based on identifying the causes and relationships that can arise in the activities of systems from fleeting changes in the environment as well as global phenomena and events, are considered. Without the constant introduction of innovations into the processes of any organization, its life cycle is sharply reduced and it becomes practically impossible to achieve the goals in general and at each stage of any activity in particular.

The central importance of information technology is based on three key conceptual foundations in strategic theory: the competitive forces of the system, the structure of the value chain, and the market hierarchy frame. Information technology can create significant and sustainable competitive advantages by changing the nature of competition: reshaping industries, creating new advantages, and spawning whole new businesses. Transactional information technologies are those systems where technology is used to ensure the quality of other activities. Information technology plays an important role in the restructuring and creation of market sectors.

The presented monograph is not an exhaustive source of theoretical and practical information on the above issues. At the same time, the information provided in the publication will be useful to the international community of educators, psychologists, educational methodologists, leaders of various levels, economists, and managers.

Editors

1.2. THEORETICAL AND METHODOLOGICAL BASIS OF SPECIALISTS VISUAL CULTURE FORMATION

Nowadays, the problem of human visual culture development, which relates to a new approach to the interpretation of images, is being raised more and more often. Visual culture is a component of the generalized concept of "culture", it integrates the ability to work with images and information. Changes in the methods of recording and forms of information, caused by technical and technological progress, actualize the question of the ontological correspondence of what is recorded with what is recorded, and the need to separate the visual component.

The most important abilities for working with visual images are those that reflect the psychological basis of creating images, namely: perception, analysis, interpretation, comparison, and representation of images, based on which a person subsequently creates an individual image. Since these abilities are individual, it is not always clear to the average person what exactly reflects the created visual image. This is explained by the fact that socio-cultural objects have different emotional, semantic, and content saturation for different categories of people who differ in the level of awareness of this cultural sphere. Therefore, the problem of interpreting a visual image through a verbal text remains relevant. However, the greatest difficulties arise with the meaningful content of visual images, and this already involves the choice of directions through which the formation of visual literacy, competence and personal culture takes place. Accordingly, in this aspect, the tasks of the modern educational system and the requirements for various training profiles specialists are also changing.

The purpose of the article is to substantiate the theoretical and methodological foundations of the specialist's visual culture formation. To achieve the goal, the following tasks were set: to analyze the philosophical basis of the concept of "visual"; to determine the theoretical foundations of figurative thinking; reveal the essence of the specialist's visual culture; highlight the peculiarities of the visual culture of the individual, taking into account the influence of various factors.

The scale of work with images contributed to the emergence of a new scientific direction "visualisation", the epistemological principles of which are used today in scientific fields where the key concept is "image". First of all, it is philosophy, cultural studies and pedagogy.

Visual as a philosophical category is considered a way of knowing and thinking when the function of "vision" is actualized. In the philosophical aspect, knowledge can be considered: as a cluster concept covering essential features; in a broad sense – as a set of concepts, theoretical constructions and ideas; in the narrow sense – as data and information[13]. The basis of the cluster concept was a set of ideas about the moving system of contexts and language "games", which is language. In this system, the ambiguity of the meanings and expressions used causes contradictions to arise, which must be eliminated by explanation[14].

The philosopher L. Wittgenstein in the second period of his work concluded that there are many forms of thinking, languages and representations, therefore there cannot be a general definition for all aspects. The scientist uses the term "see aspects", in which he develops two uses of the word "see": the first is a specific vision of something on one object; the second is to "see" something similar on two objects. The second application can develop as follows: first, the perception of the aspect and accompanying phenomena takes place, and then there is a change in the aspect and the identification of new phenomena. He also emphasizes the importance of understanding the influence of context on perception. Accordingly, the transition from dogmatic, formalistic universalism to humanistic context-oriented behaviour involves the ability to "see aspects"[15].

Knowledge can be obtained in different forms – it is facts, information, description, and skill, which have ambiguous definitions in different sciences[16]. Currently, the most accessible form

[13] Znannia.
[14] Liudvih Vithenshtain.
[15] Biletzki Anat, Matar Anat. (2021) Ludvig Vittgenstein. The Stanford Encyclopedia of Philosophy (Winter Edition), Edward N. Zalta (ed.).
[16] Znannia.

is information, the amount of which, thanks to technological progress, is increasing very quickly, it is difficult to work with it and the problem of its truth, reliability and the ability to show visually is disturbed. And the change in the practice of "vision" takes place from remote consideration of objects of the external world to the modern form when the boundary between the observer and the object of consideration is eliminated. In this way, the subject-object rupture of the world, between the inner world of "I" and the outer world of "Others" is overcome. The individual depends on his view of the essence of the object of consideration[17].

As K. Bataeva points out, you can "see" in different ways. If through the concept of "visible" any phenomena can be observed with the help of physical or "mental" eyes, then "visual" has a broader meaning, as it refers to what can be seen not only with the eyes but also with the help of various optical devices and reflective techniques. The latter help to immerse oneself in the imaginary world of dreams and fantasies[18]. In the imaginary world, there is a danger of breaking away from reality and being guided by the desire to live in a virtual world in which events are lived according to wishes.

The difference between "vision" and "visuality" was pointed out by H. Foster[19]. According to him, it consists of the difference caused by how we see and can see, how we are allowed to see and how we are forced to see. At the same time, N. Bryson emphasizes that the visuality of a specific era depends on the socio-cultural situation, which gives it a certain character, which is manifested through mental and linguistic practices and social discursiveness. He considers visuality as a cultural construct that combines many discourses that are placed between the subject and the world[20]. A person chooses which discourse is leading, and in the future, he orients himself to those discourses that will shape his visuality.

Today, there is no unambiguous definition of discourse, as it is related to aspects of consideration. According to this opinion, it becomes clear that the formation of visuality as a process requires familiarization with various discourses, for example, cultural, scientific, pedagogical, etc. Each of them has its purpose and task, and upon completion turns into a text. Discourse uses its language and context, means and techniques, it must be studied in the environment.

O. Kozhemyakina draws attention to such an important mechanism of the communicative impact of visualization as instant semantic capture and detection of accented features, which allows to display of complex concepts in clear connections or to summarize information in the form of expressive images recorded in various types of drawings (diagrams, drawings, photos, tables, pictures). Operating with images, a person mentally finds and intuitively develops non-obvious ideas. For this process to run holistically and efficiently, it is necessary to apply four stages of visual thinking: look, see, imagine, and convey to others[21]. In this regard, it can be concluded that constant work with images in the form of visual operations, considering the acquired experience and new information, can influence the configuration of connections, each time opening new aspects. In turn, this opens up wide opportunities in many spheres of activity, in particular in pedagogy, where visual thinking is considered an important means of improving learning and teaching processes.

According to J.-F.Lyotard, modern man can articulate himself and his activities, using a system of judgments and assertions, requirements and rules, concepts and contexts of various spheres. He introduced the concept of the "postmodern situation", according to which the local structuring of the elements of this system, the so-called "language games", creates a continuous "discursive" state between a person (a group of people) and "cultural reality"[22]. Discourse is associated with the readiness of a modern person to "play" thoughts, ideas, and language to find the most perfect and

[17] Biletzki Anat, Matar Anat. (2021) Ludvig Vittgenstein. The Stanford Encyclopedia of Philosophy (Winter Edition), Edward N. Zalta (ed.).
[18] Bataieva K. (2017) Sotsialna vizualistyka i media-vizualnist. Kyiv: Kondor-Vydavnytstvo, p. 25.
[19] Foster H. (1988) Preface. Visual and visuality. Seattle: Bay Press, ix-xiv.
[20] Bryson N. (1988) The Gaze in the Expanded Field. Vision and Visuality; [Edited by Hal Foster]. Seattle: Bay Press, 91-92.
[21] Kozhemiakina O. M. (2019) Vizualna komunikatsiia v suchasnii mediarealnosti. Vizualnist v estetychnykh praktykakh: ukrainskyi vymir. Cherkasy: [FOP Hordiienko], 11.
[22] Lyotard J.-F., Thebaud J.-L. (1987) Just Gaming. Manchester University Press.

impressive options. In this process, discourse is a method of perceiving and explaining the "inexpressive"[23]. At the same time, within the framework of the postmodern discourse, the subjects of the discourses have access to multidimensional cultural contents, which ensures the freedom and uniqueness of local ideas, which become even richer and deeper[24].

For example, let's consider the content of various aspects of the Ukrainian art history discourse. The goal of art historical discourse is that information on various aspects of art as such, the process of development of Ukrainian artistic culture, and art history studies of works of art contribute to their fuller understanding. Since works of art do not appear by chance, it is through context that they can be understood. During the analysis of the work, professional language rich in various special terms is used. Therefore, there are differences between the perception of works by a professional audience, art connoisseurs and amateurs.

Departure from the artistic canons of traditional art leads to the blurring of the boundaries of art. In search of their path in art, many works appear, the content of which cannot be explained even by the author himself. The appearance of such works is harmful, as it forms an omnivorous viewer, unable to distinguish a truly artistic work from a "game" of authenticity. Research in this field focuses on the fact that the content is always relevant, therefore it is important to be able to identify the internal essential features of art: "The unity of the form and content of a work of art, when the form corresponds to the content, expresses it, following the artist's ideas, conveys the author's idea, causes the perception of the work and corresponding feelings"[25]. The unity of form and content has a social impact, which is a kind of criterion for innovation. A desirable situation is when the innovative search of the artist coincided with the "non-classical 'picture of the world'", which became a fact of mass cultural consciousness. It is important to think that through artistry, which is a concrete-sensual form of expression of the subjective experience of the author, the work becomes "understandable, perceived, causes experiences, associations, emotions following the author's idea, intention"[26].

The problem of ontological correspondence of what is fixed is related to different meanings for the same concept. At first, meanings are ontologized in language and aspirations, concepts and terms appear, and later they are imprinted in various types of drawings. Later, in various forms, they begin to "work" in social practices. As O. Karpov notes, since the time when the theoretical idea of the world, the so-called "picture of the world" began to be perceived as an image, the problem of identifying the reliability of the constructed reality has arisen. Therefore, it is important to clearly understand the true essence of the model before it is put into the world. In the opposite case, society will deal with appearance, simulacrum (empty sign), forgery, and fantasy[27].

For the successful life of a person, the need for the development of imaginative thinking is obvious, because B. Ananiev proved that the visual system is the converter and integrator of a person's sensory experience at the perceptual level and the level of ideas[28]. Figurative thinking through the creation of a visual image in the imagination forms a system of ideas and allows the interpretation of complex intellectual constructions. No matter from which angle we study the image, in its entirety or in detail, it will be filled with specific content and meaning, and in its completeness will be transformed into an idea. Carrying out various intellectual operations, a person thinks to obtain certain knowledge, and with their help to find the truth. Knowledge can be anything that will help us see all the manifestations of human existence and introduce us to new realities.

[23] Lyotard J.-F. (1986) Reponse a la qustion: qu'estce que le postmoderne? Le postmoderne explique aux enfants. Paris, Galilée.

[24] Losyk O. (2002) Filosofska artykuliatsiia «dyskursu» ta «svobody dyskursuvannia» v postmodernistskomu sviti. Visnyk Nats. un-tu «Lvivska politekhnika», № 453, 321-327.

[25] Baranovska A. (2020) Mezhi mystetstva: naukovi ta navkolokhudozhni dyskusii. Ukrainskyi mystetstvoznavchyi dyskurs. Ryha: Izdevniecība «Baltija Publishing», 75.

[26] Ibidem, p. 76.

[27] Karpov A. O. (2013) Ontologization, "ontologization" and education. Questions of Philosophy. No. 9, 40-41.

[28] Ananiev B. G. (2001) Add To Selected About the problems of modern human knowledge. St. Petersburg: Piter, p. 57.

Due to internal connections, any concrete thing is rooted in the universe, where the image "becomes the very first form of certainty of being, and therefore the first unit of knowledge"[29]. From the first moment, an object is reflected on the retina, an image begins to form in the imagination, which, because of concretization, becomes more and more relieved and vivid. According to the structure, ordinary, architectural images and the image of an architectural object are distinguished. Ordinary and architectural images carry an ontological burden because they give a certain vision of reality, in which the image expresses the essence of reality in the form of an architectural structure[30].

When finding out the content of the artefact, a user action is a discourse, during which the underlying ideas are discussed, and the "game" of thoughts begins. With the help of extended dialogue, it is possible to explain what is captured by the viewer depending on his subjective experience in this area. When this dialogue takes place externally between the audience, the depth of the content is understood depending on the preparedness of the participants. However, the most powerful developmental influence on a person is an internal dialogue that forces one to find words and comparisons to visualize the inexpressible.

Degradation of figurative thinking takes place when it is overloaded with ready-made, externally given figurative structures. Then a person loses the ability to independently generate the meanings of images, to "see with the thought". The transition from figurative thinking to informational and consumer thinking leads to the fact that consciousness is closed, and the ability to understand, imagine and generate meanings is lost, blindly succumbing to the influence of the prevailing ideology[31]. At the same time, visual constructions built from simulacra fill the imaginary sphere with illusions and form a fragmentary (clip) consciousness. Real life is replaced by its simulation, it becomes imaginary, in which there is room for any fiction.

The image represents reality, and its content consists of a completed ideal on the background of the concretely existing. Therefore, catching a glimpse of the most essential in the phenomenon can be sufficient for understanding the whole. This resembles the situation when a flash of lightning outlines the outlines of an object, by which one can guess its structure. The content of the figurative representation of reality has many facets and nuances. And if we do not understand something in reality, it is because not all sides have been revealed. Just as a picture emerges in the developer, the meaning of the image becomes deeper with each new facet. Through the combination of many discourses and images that arise as a result, the process of visualization is carried out. Accordingly, the multifaceted coverage of the image brings us closer to its truth, and scientificity.

A picture is a material embodiment of an image. Therefore, when working with a picture, the image is always present. For all pictorial forms, the image is an "absent presence" that always identifies the object. Forms of visual data (pictures, electronic files) are active participants in the communication process [32]. "Visual theory assumes not only the cognitive nature of the act of painting, the creation of a visual image but also the heuristic nature of the products of this act. The pictures themselves recognize and direct this process"[33]. In the context of this opinion, the importance of visual experience becomes obvious, because the depth of interpretation of the form of the visual given, its heuristic content, depends on its quality.

As S. Ovodova notes, reality and culture are created, described and transformed with the help of two means – visual and verbal. However, for this they are unequal in their capabilities because there is a lack of adequate language for the interpretation of visual images, it is often difficult to find an appropriate verbal designation, which cannot be said about verbal texts that use language as a special code for deciphering. Visual and verbal are mass communication methods that have

[29] Petrushenko V. L. (2000) Epistemolohiia yak filosofska teoriia znannia. Lviv: Vyd-vo Derzhavnoho universytetuLvivska politekhnika», p. 134.
[30] Ibidem, p. 134.
[31] Dolzhenko O. V., Tarasova O. I. (2009) Deontologization of understanding. Problems of Knowledge. P. 211-212.
[32] Avetysian A. I. (2017) Kulturfilosofski aktsenty vizualnoi teorii Tomasa Mitchela. Filosofiia i politolohiia v konteksti suchasnoi kultury. Vyp. 2, p. 4.
[33] Ibidem, p. 9.

different representative potentials. In practice, this means that the realization of the representative potential of the visual at this stage of its methodological research is reduced to the use of the mechanism of verbalization, which unarchives the content and creates a narrative[34].

The most traditional cultural practice is the practice that is based on the desire to find a clear meaning of the image, using its visual-figurative and logical-verbal components, the presence of a single ideology and a clear value model into which it fits. Accordingly, the logical-verbal way of conceptualizing reality is aimed at structuring the world, squeezing it into various schemes and models that make it possible to find meaning and identify certain regularities. At the same time, innovative search is associated with a visual image way of conceptualizing reality, when the visual image becomes timeless and multifaceted in interpretation. In this case, the visuality is detached from the word and sinks deeper and deeper into the inner layers of the pictorial text. In the opinion of the author, the principles of perception of visual images are correlated with the main characteristics of visual and spatial thinking, and they can include: the simultaneity of the integrity of perception and its contextuality; the multiplicity of connections and at the same time lack of consistent determinism; the associative nature of identifying connections[35].

The image as a visual text integrates aesthetic characteristics and information saturation. The formation of a person's ability to work with them implies a step-by-step process in which he moves from the level of visual literacy to visual competence. If amateurs have an aesthetic impression of the content of an artefact, then visual literacy is needed to be fascinated by the intellectual complexity of an idea, to search for the novelty of meaning, and other aspects, which eventually develops into competence, reaching the peak of visual culture.

The figurative characteristic of any phenomenon depends on the relationship between it and the subject. According to the purpose, it can be narrowed or expanded. Research into the mechanism of figurative thinking has become an important basis for many modern scientific developments. Among them, we can single out basic studies that have been tested over time: I. Sechenov (image as an active regulator of behaviour), I. Pavlov (the human need for image perception), P. Anokhin (stages of image formation) and others. In the theory of functional systems, P. Anokhin emphasizes that the absence of an image means incomplete perception, and therefore a person is limited in receiving information[36]. Based on their works, it was established that transforming surrounding information into an image is helped by the emotional attitude of a person, which gives it a personal colour, and emotionality is a filter for selecting information. Subsequent research in the field of psychology was concerned with finding out how the image is related to the transmission of information in the brain. In this aspect, A. Volovnyk, for example, examines models of information transmission in the brain, the process of recognizing images and storing them in various types of memory, using those forms of information representation in the brain that can be implemented by the central nervous system[37].

As a rule, two components are distinguished in an image: imagery and objectivity. Imagery is the multicolour of the surrounding world, which is perceived by our consciousness in the form of images, and objectivity "is the attribution of certain sensory characteristics of our perception of reality to a real object"[38]. The analysis of the role of imagery and objectivity in understanding the environment leads to the conclusion that: "without objectivity, imagery loses its definition, without imagery, objectivity becomes meaningless. At the same time, it can be argued that imagery and objectivity appear as opposites to each other, because in certain sense imagery is not objectivity, and objectivity is not imagery"[39]. Each artefact has its properties. Some of them characterize imagery and others objectivity. In the process of human activity, there are moments when these properties are

[34] Ovodova S. N. (2015) Verbal and visual ways of representing cultural meanings. Visual images of modern culture. "Non-capital" culture: visual markers of regional identity. Omsk: Publishing House Om. state un-ta, p. 53-54.
[35] Ibidem, p. 60.
[36] Anokhin Petro Kuzmych. Velyka psykholohichna entsyklopediia [online].
[37] Volovnik A. A. (1991) Informatics of the brain. Human. Issue. 2. p. 7-17.
[38] Petrushenko V. L. (2000) Epistemolohiia yak filosofska teoriia znannia. Lviv: Vyd-vo Derzhavnoho universytetu Lvivska politekhnika», p. 135.
[39]Ibidem, p. 135.

separated from each other, only to later be combined in a new combination. This is the essence of creative work with an artefact.

Changes in the relationship between image components lead to image modification. This internal contradiction finds a way out through the multifaceted nature of images. Images can be divided into perception images and specialized images. The latter is a modification of the image depending on the outlined conditions of its consideration. They include scientific, artistic, religious and cult images, images of specially constructed theories, that is, those that are specially developed and developed. Specialized types of connection are distinguished between imagery and objectivity – rigid, associative and accented. Such psychological mechanisms as imagination, thinking and intuition are used to implement image modifications. This means that for productive work with images, the subject needs to develop the ability to fantasize, imagine, schematize, using figurative and heuristic thinking, as well as turn to unconscious ways of knowing, that is, intuition.

Starting from the 19th century, the problem of intuition began to be considered in philosophical and psychological directions, which is explained by the wide semantic range of the concept, as well as the form of expression. In philosophy, intuition is a specific form of cognition, which is considered as an ability or process: the ability to obtain knowledge without awareness of the ways and conditions necessary for this; finding the truth without connection with sensory and rational cognition; "the process of obtaining knowledge through a holistic understanding of a problem situation without discursive derivation and proof"[40]. At the same time, in psychology, intuition is considered a sensual, insightful, and direct understanding of the truth "without a logical basis, based on previous experience"[41]. This phenomenon is associated with the moment when an individual goes beyond the established stereotypes formed by the experience of the practical and spiritual activity of a person. It is determined by the nature of human creativity when intuitive knowledge was used in the search for solutions to problematic situations. Therefore, in all types of professional activity, intuitive components are revealed, which were formed as professional secrets. The advantage of intuitive thinking is that intuition as a phenomenon makes it possible to grasp the problem as a whole and overcome the limitations of traditional approaches to its solution.

In the context of visualization, it is worth paying attention to M. Bunge's classification, according to which intuition can be sensual and intellectual. Each of them appears in different forms. Sensory intuition has forms that characterize it, such as perception – the ability to interpret, and quickly identify the meaning of an object, phenomenon, or sign; imagination – the ability to create metaphors and imaginary constructions. Intellectual intuition is characterized by such forms as the mind, which is considered as the ability to synthesize, generalized perception and accelerated deduction when common sense is taken as a basis, that is, judgment based on everyday knowledge; assessment, which is associated with practical wisdom, with the ability to quickly and correctly assess the degree of importance of the problem, determine the reliability of the method and the usefulness of the proposed action[42].

Since a sign of intuition is the absence of visible ways of obtaining knowledge, it is often used when there is a shortage of the necessary information. However, M. Bunge, a researcher of this phenomenon, warned that "Intuition is fruitful to the extent that it is clarified and processed by the mind. ... Transformed into formulated concepts and provisions, it can be analyzed, developed and logically connected with the following conceptual constructions. Fruitful intuition is included in the main content of rational cognition and thereby ceased to be intuition"[43]. Such a remark is always relevant and raises the issue of developing not only imaginative but also critical thinking in an individual.

As shown by studies of figurative thinking (O. Braddick, R.L. Gregory, M. Hershenson), conceptual and eidetic intuitions can be added to the mentioned types of intuition, which are

[40] Filosofskyi entsyklopedychnyi slovnyk. (2002) K.: Instytut filosofii imeni Hryhoriia Skovorody NAN Ukrainy: Abrys, p. 248.
[41] Shapar V. B. (2007) Suchasnyi tlumachnyi psykholohichnyi slovnyk. X.: Prapor, p. 190.
[42] Bunge M. (1967) Intuition and science / transl. from English. E. I. Palsky. Moscow: Progress, p. 135.
[43] Ibidem, p. 152-153.

considered inverse in terms of the implementation mechanism and result. Conceptual intuition is the process of building new concepts based on existing visual images; eidetic intuition – the creation of new visual images based on existing concepts[44]. Knowledge of the mechanisms of interaction of these types of intuition, in our opinion, is important for the development of visual literacy and relevance in the educational process, as it can affect productivity and efficiency.

Eidetism in the field of cultural studies is considered as "the artist's ability to preserve and reproduce vivid images and episodes"[45]. Accordingly, the adjective "eidetic" means a sign of receiving a vivid and very detailed memory of visual images. The difference between ordinary and eidetic images is that a person continues to perceive the second of them as if in its absence. From a psychological point of view, the existence of an eidetic image is explained by the residual excitation of the visual analyzer. Since eidetism as a special type of memory is inherent in every person, it allows for retention and reproduces images of previously seen objects and objects for a long time. The type of eidetic memory is characterized by the fact that after 30 seconds of viewing a picture or object, an individual can reproduce and retain it in memory for a short time. Based on this ability, methods of working on memory development are built.

Usually, the level of intellectual performance of a task or action is most fully assessed by the effective and operational-dynamic characteristics considered in traditional theories of intelligence. However, traditional theories of intelligence did not take into account those characteristics of phenomena that are based on acquired experience, namely competence, talent and hidden knowledge. This caused the appearance of unresolved problems, for the solution of which M. Kholodna suggested considering individual mental experience as a key (alternative) phenomenon in new theories of intelligence. In this context, intelligence is considered as "a special form of organization of mental (mental) experience in the form of existing mental structures that generate a mental space of reflection and create within this space mental representations of surrounding changes"[46]. Therefore, knowledge of the mechanisms by which an individual "picture of the world" is born in the process of sifting through the elements of individual mental experience provides an answer about the interaction of concepts and images.

Mental structures are considered as some mental mechanisms, in which all the available intellectual resources of the subject are gathered, which under the influence of external influences can unfold into the mental space. Mental space defines the area of generation and integration of information. How successfully the subject will be able to model reality depends on his ability to form specific spaces for groups of knowledge, combine them (a step towards integration) and make various conclusions. At the same time, this process accompanies the interaction of concepts and images.

The research results analysis of the mechanisms of representation (J. Bruner, F. Kliks, J. Royce, K. Oatley and others) made it possible to conclude that "representation is a special form of organization of mental experience in the form of an individual perception (how a person mentally sees in a given specific moment a specific event)"[47]. The form of mental (mental) representation can be individual, but it must meet two basic requirements: the first – the mental structure is generated by the subject himself and is formed based on external and internal contexts; the second is an invariant reproduction of the objective regularities of the fragment of the real world that is displayed. In this context, it can be assumed that each individual represents the received information in his way.

In the organization of knowledge intellectual reflection, representational abilities play different roles, therefore, according to M. Kholodnaya, it is not so much the knowledge itself that is important, but how the actual mental image of the situation is organized. For individuals to fully comprehend reality, taking into account their unequal representational abilities, external influences are applied

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[44] Eidetyka.
Yablonska T. M. (2011) Intuitsiia. Entsyklopediia suchasnoi Ukrainy [online]. Kyiv: Instytut entsyklopedychnykh doslidzhen NAN Ukrainy.
[45] Literaturna entsyklopediia: T. 1. (2007) Kyiv: VTs «Akademiia», p. 314.
[46] Kholodnaya M. A. (2002) Psychology of intelligence. Research paradoxes. St. Petersburg: Peter, p. 106.
[47] Ibidem, p. 102.

to mental structures that trigger various mechanisms of reorganization of experience. To find possible mechanisms of influence, it is worth turning to the conceptual structure, which M. Kholodnaya considers as an integral cognitive formation, which includes verbal-speech, visual-spatial, sensory-sensory, operational-logical, mnemonic and attentional cognitive components[48]. She also revealed a direct relationship between the possibilities for reflection and sensory impressions with the formation and effective work of conceptual structures. From this, we can draw an important conclusion that if an individual has poorly formed conceptual structures or they do not work well, then the intensity of sensory impressions decreases due to insufficient opportunities for reflection. Accordingly, it negatively affects the visual thinking of an individual.

During life, a person learns the universal relationship of phenomena, involving three ways of obtaining information about the environment, namely effective, figurative and verbal-symbolic. As J. Bruner believed, a very important feature of the higher stages of intelligence is the existence of a system of mutual influences and transitions of the specified methods of obtaining information[49]. As a result, the contents of the concepts are filled and expanded according to the hierarchy, that is, from a lower concept to a higher one. This entire path is also accompanied by the emergence and modification of images. Already in the theory of the step-by-step formation of concepts and mental actions, P. Halperin considers higher forms of intellectual activity as integration of subject-practical, figurative-spatial and verbal-speech components[50]. Research by L. Veckker[51], M. Osorina[52], M. Kholodnaya[53] made it possible to state that the image is an organically integral component of the conceptual structure. In the process of thinking, there is a continuous transfer from the language of images (spatial-object structures) to psycholinguistic language, integration of visual analysis with speech actions.

To understand exactly how images work during thinking with the help of concepts, M. Osorina singled out the effect of the following types of image structures: concrete-associative images, concrete-symbolic (related to elements of generalization of the content of concepts), generally accepted normative images, figurative models and schemes, sensory-emotional images[54]. Investigating this topic more thoroughly, M. Kholodnaya concluded the relationship between the variants of figurative translation of concepts and the degree of their generality. The frequency of use of this concept in a person's speech experience can be considered an indicator of the generality of a concept. She cites important facts for the development of figurative thinking: "first, with the increase in the degree of generality of concepts, the figurative components of conceptual thought became more general; secondly, sensory images are more often activated in a group of concepts with a high and maximally high degree of generality; thirdly, there is a sharp increase in the number of subject-structural images in the group of concepts of a medium degree of generality"[55]. Since the conceptual mental structure is the result of the integration of verbal, speech and image components of mental experience, its functioning can be compared to a "mental kaleidoscope": within the concept, various signs are sorted, and signs and concepts of other orders are correlated until the moment of obtaining an image adequate to the concept.

The structure of figurative thinking is related to the type of spatial relations of a person when working with an image or visualization and consists of the following substructures (components):

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[48] Ibidem, p. 121.
[49] Bruner J. (1971) The learning process. Moscow: Mir, 162 p.
[50] Galperin P. Ya. (1976) Introduction to psychology. Moscow: Publishing house Mosk. university 158 p.
[51] Veckker L. M. (1976) Mental processes. Thinking and intelligence. Leningrad: Publishing House of Leningrad State University. T. 2. 334 p.
[52] Osorina M. V. (1976) Experimental study of figurative structures at different levels of mental activity: author. dis... cand. crazy. Sciences: 19.00.01 / Leningrad. state un-t. L.: Len. un-t, 19 p.
[53] Kholodnaya M. A. (2002) Psychology of intelligence. Research paradoxes. St. Petersburg: Peter, 272 p.
[54] Osorina M. V. (1976) Experimental study of figurative structures at different levels of mental activity: author. dis... cand. crazy. Sciences: 19.00.01 / Leningrad. state un-t. L.: Len. un-t, 19 p.
[55] Kholodnaya M. A. (2002) Psychology of intelligence. Research paradoxes. St. Petersburg: Peter, p. 124.

projective, ordinal, metric, compositional, and psychological[56]. Let's consider the essence of these substructures with figurative thinking[57]. The psychological substructure ensures connectedness, compactness, closure of the image, continuity and actions on it. In the process of working with the image, external and internal details are revealed and connections between parts are established. As a result of the action of this component, the image of the concept should be formed. The order substructure helps a person to constantly compare images and their elements, to establish the relationship of subordination of size (larger-smaller, longer-shorter), distance, shape, location in space, and temporal representations. The development of this component is related to the development of visual-spatial, creative, and operational thinking, which are basic for mastering professions of various profiles. The metric substructure allows you to set quantitative characteristics and relationships in objects and their components. Its development is a key requirement for those professions where it is necessary to have a sense of changing parameters (size, weight, brightness, distance, etc.). The compositional substructure of figurative thinking allows you to perform direct and reverse actions on images, collapse and expand them in different sequences, to combine several blocks of the subject into one. It is important for carrying out creative, artistic and design activities, as well as in those types of human activity where the aesthetic aspect is important. The projective substructure allows the subject to recognize, create images and operate with them, as well as to navigate among spatial objects and graphic images, to establish correspondence between the object and its various projections. The importance of this substructure for a person is that it stimulates the search activity of a person. However, in the process of working with images, you also have to use operations of logical thinking, in a particular analysis.

In rational (or conceptual) thinking, which is the second basic human thinking, substructures characteristic of it are distinguished, based on psychological actions with concepts, in particular: analytical, analogical, combinatory, integrative, and system-forming. In the complete process of interaction of concepts and images, depending on the need, all substructures of imaginative and rational thinking are involved.

For the development of figurative thinking as a basis for visual literacy and competence, it is important to understand the mechanisms (options) of mutual translation of a concept into an image and vice versa. Research in this direction has shown that each of us is dominated by different substructures of figurative and conceptual thinking, which leaves an impression on the perception, processing and reproduction of various information, and therefore on the formation of an individual picture of the world. Imagination plays an active role in the process of forming a visual image of the world. First, there is a generalization of images that are tied to specific conditions and are schematic. Over time, the images are refined and filled with a deeper meaning of a higher order, which gives reason to conclude their completeness.

Thus, knowledge of the psychological basis of visuality opens wide opportunities for the development of visual literacy and human competence. These opportunities should be implemented through educational practices of training future specialists, taking into account the content of visual culture adequate to the specifics of professional activity.

The problems of visual culture affect almost all spheres of human activity. Each field has its requirements, some at the level of visual literacy, and some at the level of visual competence. In general, visual culture is a complex phenomenon, about which disputes have been raging for a long time. W. J. T. Mitchell drew attention to the complexity of the problem, emphasizing that visual culture is a broad concept, and the image is only its component[58]. Images as a form of visual communication create cultural meaning and visuality and can be enriched through integration with various social spheres. To better "read" visual images and detect visuality, visual culture is needed.

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[56] Kruglova E. A. (2001) Taking into account the individual characteristics of the structure of imaginative thinking of students in the teaching of history. Psychological Science and Education, No. 3, p. 52-53.

[57] Slipchyshyn L. V. (2015) Psykholoho-pedahohichnyi aspekt rozvytku uminnia pererobliaty informatsiiu v maibutnikh robitnykiv. Problemy osvity. Vinnytsia; Kyiv: [Vyd-vo ZhDU im. I. Franka], Vyp. 84. P. 52-53.

[58] Mitchell W. J. T. (1996) What Do Pictures Really Want? October, No 77, 71-82.

The visual studies of W. J. T.Mitchell and H. Böhm created a discourse based on a theoretical situation in which not only language but also images have heuristic potential. According to W. J. T. Mitchell, the beginning of visual culture should be sought in the field of non-artistic, non-aesthetic, unmediated visual images and experience, that is, every day "vision". First of all, it is necessary to distinguish the concepts of "image" and "picture" according to the criterion of relation to the material medium: unlike an image, an image cannot be hung on the wall, since it can be preserved and revived only in memory, memories, stories and other means of transmission, storage and reproduction of information (media). Its "play" in the mind depends on the degree of generalization of the image, that is, the generalized image becomes recognizable more quickly and can identify the object for any pictorial forms. The main theses of W. J. T. Mitchell's visual theory: the picture is known by the image; the picture must be represented either by a material carrier (image) or by a verbal unit; the image cannot be reduced to language; in the image, as well as in the language, meaning and heuristic potential are imprinted; the centre of the conceptual system is a metaphor in which image and word are integrated; images are characterized by a certain specificity that manifests itself in their life cycle; characteristic features of images are meaningfulness and informativeness[59].

Here we can recall the events of the distant past, when in search of medical visuality, medical theatres became popular, thanks to which medicine received visual images of the human body, which gave rise to scientific visualization. Today we see that a lot of data and images are produced by machines, but at the origin of these processes are specialists with feelings, knowledge and experience. Therefore, these results have their cultural context. Researchers in the fields of visual arts, design, communication, linguistics and other fields are helping to rethink the historical development of the visual, especially how technological progress has affected visualization, contributing to the emergence of new theories about the interpretation and analysis of visual culture. In turn, the development of technologies and the emergence of new applications have opened wide opportunities for visual detection. You can name a sufficient number of online services (Animation Maker by Me Heritage, Animation Maker by Crello, Animation Maker by Pix Teller) and applications (PixaMotion, Reface, StroryZ, ThinkLink) that provide an opportunity to detect visuality. A special role belongs to the Internet, which allows you to combine text and images, reading and viewing at the same time.

As noted by M. Sturken and L. Cartwright, the study of visual culture is complicated by the fact that it is not a fixed set of tastes, ideals, aesthetics or practices, but an interactive set that is constantly changing. It is a much more complex phenomenon, because it takes into account not only images and visuality but is also based on multimodal and multisensory cultural practices. Its meaning is formed primarily in a specific culture, which in turn affects the consciousness of individuals. In this sense, the worldview of society is formed through competition and coordination of practices in a particular society. In modern conditions, most researchers of visual culture emphasize the fact that due to historical shifts, technological development and changes in the practice of viewers, there is a cross-enrichment of visual categories in different fields (art, science, medicine, etc.), and the same images and images are used in different social spheres[60].

Visual culture is polycentric because the visual does not come in its pure form – it integrates the work of the body in various aspects (hearing, touch, smell) and touches all texts and discourses. The visual is the point of entry into the multidimensional world of intertextual dialogism[61].

Attention should be paid to such important factors influencing the development of visual culture as the economy and intensive development of visual technologies. In the economy, computer technologies, images, and visual and sensory communication are widely used, which are important when working with visual and virtual objects, which form a space for creating, improving and preserving content, and developing visual means. The emergence of new forms of visual mass

[59] Ibidem.
[60] Sturken M., Cartwright. (2018) Practices of Looking: An Introduction to Visual Culture, 3rd ed. NY: Oxford University Press, p. 7.
[61] Shohat E., Stam R. (2001) Narrativizing visual culture: towards a polycentric aesthetics. The visual culture: reader. 2-d ed. / Ed. N. Mirzoeff. London-NY: Routledge, p. 55.

communication actively changes the way people communicate, the formation of personal experience, and the process of learning and sharing.

If the concept of visual culture has an academic orientation, then the space for its study is formed by those disciplines in which visuality plays a leading role. In the case of specialists in the artistic profile, they include those disciplines related to art and design, and in the technical profile – those that require constructions, dynamic pictures, and graphic representation (physics, drawing, engineering graphics, statistics). At the intersection of scientific fields, new directions have appeared that significantly expand the possibilities of traditional disciplines for them.

In particular, one of these directions is computer linguistics, which is based on the automation of processing, exchange and storage of various information that exists in text format. Its main task is the linguistic support of information systems. Each of the components of computer linguistics has its task: linguistics analyzes, reveals and interprets the meaning of texts in all manifestations of the language system, and information and computer technologies organize parameterized text information into databases and knowledge bases, create hypertext networks with navigation in huge arrays, form corpora of texts. Without developed visual thinking, it is impossible to grasp the depth of possibilities of hypertext technologies.

Therefore, taking into account the multifacetedness and complexity of the phenomenon of "visual culture", it is necessary to consider the essence and mutual relationship of the concepts "culture", "visual culture", "visual education", "visual competence" and "visual literacy".

Culture. According to[62], the category "culture" is considered in the following aspects: cultivation and care of the land, that is, the object that bears fruit; development, which is qualitatively determined by levels – "care, improvement, the ennoblement of physical, mental and spiritual forces, inclinations and abilities of a person"; education, which is based on a set of "methods and methods of organization, implementation and progress of human life, ways of human existence"; education, as a process of transferring a set of material and spiritual assets embodied in the results of productive activities of people; respect associated with a valuable attitude to reality, to socio-historical formations localized in space and time, which, in turn, are classified according to various signs and characteristics (historical types, ethnic or regional characteristics, etc.). Modern philosophical research actualizes the problems of the ontology of culture, social and cultural progress, the study of universal, special and unique in the development of culture, and the identification of its basis. In this context, culture can be considered as a "symbolic and communicative design of an individual in the element of time", although it is allowed to go beyond the boundaries of one's time, which allows one to get into "that existential and anthropological space that connects different times".

In the narrower sense, culture is a set of values, ideals, and norms, which primarily perform a regulatory function in society. At the same time, the socio-historical character of culture dictates a much wider range of functions, among which scientists distinguish those that are considered basic: cognitive, informational, communicative, integrative, socialization, adaptive, valuable, regulatory, semiotic[63], cognitive, informational, worldview, communicative, regulatory, axiological, educational[64], creative, cognitive, informative-broadcast, communicative, regulatory, axiological (evaluative), educational, worldview[65]. An analysis of only these isolated functions shows that their choice depends on the orientation to the main approaches, leading functions, essential features and typical structural elements. In this context, the work[66] defines the main approaches to the study of culture: philosophical – considers the system of human reproduction and development as a subject of activity, the main function is aimed at the production of ideas and their material embodiment, and the essential features are universality and generality; anthropological – studies the system of artefacts, knowledge and beliefs, with the help of which adaptation takes place and the way of life of the people,

[62] Blikhar V. S. ta in. (2020) Filosofiia: slovnyk terminiv ta personalii. Kyiv: KVITs, p. 139.
[63] Herchanivska P. E. (2006) Kulturolohiia: / Za red. V. I. Panchenko. 2-he vyd. Kyiv: Universytet «Ukraina», p. 45-47.
[64] Khairullina Yu. O. (2011) Svitohliadna kultura osobystosti: strukturno- funktsionalnyi analiz. K.: Vyd-vo NPU imeni M. P. Drahomanova, p. 24.
[65] Kulturolohiia: teoriia ta istoriia kultury (2010). Vyd. 3-tie. Kyiv: Tsentr uchbovoi literatury, p. 16-19.
[66] Ibidem, p. 12.

is reproduced, an essential feature is the symbolic character; sociological – examines the system of values and norms that mediate the interaction of people, focuses on model support and socialization, an essential feature is a normativity.

Such a thorough and versatile delineation of the category "culture" gives reason to consider culture as a complex dynamic phenomenon that manifests itself at the social, collective and personal levels, which have differences in functions and content. At the social level, culture integrates social relations aimed at the creation, assimilation and preservation of material objects and spiritual values, the content of which is formed by historical time and the technical and technological base of society. The collective level encompasses those values, that become spiritual and practical guidelines in all spheres of society's life. Personal culture reflects the spiritual component of a person's life, in which ethical, moral and aesthetic values, interact, which are imprinted by historical time, the method of production, cultural experience and national-cultural features. Therefore, one can agree with the opinion of V. Moskalenko that "... the culture of the individual is nothing more than a single projection of the culture of society, community"[67]. Everything relevant to the development of society should be reflected in personal culture as components of different content. Depending on the relevance and importance under certain conditions, these components are considered as a separate type of culture, which only confirms the polyaspect and dynamism of the cultural phenomenon. The formation of a highly cultural personality in harmony with the environment is possible under the condition of a dialectical connection of social, collective and personal levels[68].

In the process of socialization, and learning, a person directs his efforts to achieve qualitatively excellent educational results that correspond to the following hierarchy: literacy, education, competence, culture and mentality[69]. The transition to a higher level is accompanied by spiritual integration when a person rises from the level of a consumer of mentalities to a generator and producer of spiritual experience. However, the contribution to spiritual experience depends on the spiritual qualities of the individual and the scale of their detection[70].

Among a large number of culture definitions, those that are consonant with the topic of the study were selected. We present the definitions of visual culture, which are also focused on different aspects.

Visual culture is: "Social practices, contexts, and symbolic content of visual representation and aesthetics"[71]. In this definition, emphasis is placed on the interdisciplinary nature of cultural studies, attention is paid to the ethnographic perspective in the study of visual culture, and emphasis is placed on the process of creating visual images (creation and representation) and the impact on social relations and cultural meanings. Accordingly, the need to possess the ability to interpret content, which is based in turn on the ability to recognize and decode images, is actualized. In the field of using visual images, the ability to encode information in an image is also relevant.

Visual culture is a phenomenon that conveys information about various visual and cultural aspects of people's lives[72]. Accordingly, it has parallels in all types of culture, in particular, in "tactile", "taste", "acoustic", "motor" and other types of culture. Each of them has its history of development, which was not always connected with the history of "visual". In this aspect, the "visual" is limited by the psychophysical laws of optics, however, together with technical and technological progress, it became possible to obtain thorough and wide-ranging visual information.

Visual culture is a multi-level system of "methods and means of displaying information using various types of art, creating aesthetically calibrated standards of visual perception, artistic and

[67] Moskalenko V. V. (2015) Kultura i osobystist. Aktualni problemy psykholohii /Instytut psykholohii imeni H. S. Kostiuka NAPN Ukrainy. Kyiv, Feniks, T. 11, Vyp. 12, p. 354.
[68] Kulturolohiia: teoriia ta istoriia kultury (2010). Vyd. 3-tie. Kyiv: Tsentr uchbovoi literatury, p. 16.
[69] Gershunsky B. S. (1998) Philosophy of Education for the 21st Century. In search of practice-oriented educational concepts. Moscow: Perfection, p. 67.
[70] Ibidem, p. 196.
[71] Vivanco L. A. (2018) Visual culture. A dictionary of cultural anthropology [online]. Oxford University Press.
[72] Whitney Davis. (2014) Encyclopedia of Aesthetics. 2 ed. Oxford University Press, USA, 3288 p.

graphic culture"[73]. This definition of visual culture is focused on the professional activity of a teacher, which is aimed at revealing and understanding artistic images. The main task of the teacher is to teach students to "see", which in turn implies that they have a certain range of competencies in the field of art education. The visual culture of the acquirer is considered as a complex of his pictorial, creative and artistic project abilities, formed in practical, purposefully organized artistic and pictorial activities. Artistic vision prepares the ground for the formation of artistic images, the development of creative imagination, and visual and creative thinking. Since this definition of visual culture is focused on the aesthetic experience that is learned in the process of involvement in art and through the attitude to the environment, it accumulates its following components: imaginative thinking based on visual perception and visual attention, visual memory, sensory-emotional experience, and cultural reflection.

In the context of the anthropological approach, visuality is considered the basic form of modern culture, through which the world and reality are represented[74]. In this form, visual communication enriched by various cultural codes comes to the fore, and the emphasis in the texts shifts from narration to short texts in which the meaning is easily grasped, which require minimal work on decoding, the play of reality and illusion, novelty and unusualness is appreciated, the beauty of the content[75]. M. Gabova cites the characteristic features of modern visuality: the predominance of visuality in all spheres of people's lives; high speed of perception of visual images due to simplicity, stylization, brevity and versatility; demonstrability and efficiency; clear information saturation. However, the weakening of critical thinking, the formation of fragmented thinking, and the reduction of the desire to participate in the construction of complex storylines and delve into the tangle of thoughts are observed as negative consequences of visualization[76].

Visual representations of the technical world are based on the aesthetic reflection of reality, which in itself enriches human consciousness and helps to highlight the dominant features of modernity. A new term appeared within the framework of aesthetic-oriented visual culture – visual art, which in turn combines traditional academic fine art and modern art. The latter unites those types of art in which the power of artistic expressiveness lies in the emotional perception of the entire artistic image – art objects, architecture, sculpture, photography, installations, and performance. Since such an image has many facets in its semantic content, it becomes accessible to the mass viewer, and affects his consciousness and artistic values. By nature, modern art is conceptual, its important elements are signs and symbols, through which it conveys certain ideas and views to the viewer[77].

So, in the context of the anthropological approach, the visual culture of society is formed from the following elements: concepts - the language with which a person wants to organize experience (the taste of objects – a cook; colour, form – an artist; construction, material – an engineer, etc.); relation – constituent parts of the world, connected in a certain way (in space and time, by meaning, determined by cause-and-effect relationships); values (a person should gravitate towards generally accepted beliefs, which are the basis for moral and ethical principles); rules – regulate the behaviour of people following the values of visual culture.

Art is a tool with which an artistic professional works on the realization of an idea using visual competence. Since art as a system contains a set of signs, images, allegories, and images-symbols that were formed as a result of the cultural and historical development of the people, the connection between visual and ethnocultural competence is obvious.

In the context of art education, L. Masimova gives her understanding of visual culture. She took into account the close connections between informational and communicative competencies, an important component of which is the visual component, and proposed the following structure

[73] Syrova N. V., Chikishev V. N. Visual culture as a means of forming a general and professional culture of a person. Bulletin of Minin University. 2018. Volume 6. (22).
[74] Gabova M. V. (2017) Visual culture of modern society: experience of typology. Human. Culture. Education. 2 (24), p. 32.
[75] Ibidem, p. 34.
[76] Ibidem, p. 39.
[77] Ibidem, p. 37.

of visual competence: "1) the ability to translate visual images into verbal information; 2) the ability to create a verbal text based on an image; 3) understanding the symbolic nature of the visual image; 4) knowledge of universal and national visual stereotypical images-symbols; 5) familiarity with visual genres of modern media content; 6) interpretation of the semantic load of the composition; 7) development of communicative ideas; 8) creation of own visual information; 9) the ability to motivate the appropriateness of the form of information presentation"[78]. The scientist concluded that to fully create visual information, it is necessary to know the history of code and stereotype formation, to understand the interaction of visual and other types of images, and to know the rules of use, techniques of visual thinking and means of creating visual information.

An important direction of future specialists' professional training in the artistic profile is the development of the semantic dimensions problem of the creativity results, which will ignite from the consciousness of the creator. In this context, the question of how a teacher should organize the formation of students' visual competence using his discipline or creativity is raised.

Visual representations of the technical world are based on the aesthetic reflection of reality, which in itself enriches human consciousness and helps to highlight the dominant features of modernity. At the same time, the visual culture of technical professionals has its characteristics. According to I. Nyshchak, the basis of understanding a technical graphic image is general scientific knowledge, which is formed during the study of scientific and natural disciplines: understanding the meaning of the concepts "point", "line", "surface", "body", "figure", "proportion", "scale", etc.; representation of coordinate systems; knowledge of the basic principles of Euclidean geometry (the axiom of a straight line, right angles, the axiom of parallelism, methods of specifying the spatial position of a point, line, plane, etc.); the concept of a mathematical function and its graphic representation; the concept of a curve and its order, etc.[79]. A person must learn to "see" a real spatial image behind each line, each graphic picture or conventional designation, and be able to connect it with a real object of the surrounding reality. This ability is formed in the educational process with the help of an organically connected set of educational materials that reflects the spatial and geometric properties and forms of the depicted object.

Based on the requirements of the professional field and the content of the technical specialist's training, it is possible to distinguish the content of graphic competencies and the main areas of work with it: objects of graphic images and their spatial characteristics, graphic images of geometric and technical information, graphic images and documentation of productions various areas, graphic constructions, designing.

In 2018, the European Union adopted a digital education action plan, which recognized the relevance of enriching learning with digital technologies, which opens access to a large amount of information and resources. In 2019, the project "Visual Literacy for engineering education (VLEE)" was launched as part of the EU Erasmus+ Project based on the collaboration of partners and experts from Poland, Spain, Denmark, Ireland and the United Kingdom. The main goal of this project is to assist in the development of visual competencies for higher engineering and vocational education, using the potential of all disciplines studied[80].

According to research materials within VLEE, visual literacy is defined as "a set of skills and abilities to understand, create, and think and learn using all kinds of visual material, such as images, pictures and graphics or 3D objects"[81]. It defines a set of abilities that allow you to understand information, generate ideas and communicate using visual materials. If literacy is the interpretation and creation of texts, then visual literacy refers to a set of abilities that allows you to understand information, ideate and communicate using visual materials. The extent of visual literacy depends

[78] Masimova L. H. (2003) Vizualna hramotnist u systemi mediaosvity. Uchenые zapysky Tavrycheskoho natsyonalnoho unyversyteta ym. V. Y. Vernadskoho, № 3, p. 174.
[79] Nyshchak I. D. (2014) Inzhenerno-hrafichni znannia, uminnia ta navychky vchytelia tekhnolohii: kvintesentsiia poniat. Pedahohichni nauky, T. 1, № 66, p. 366.
[80] Różewski P., Kieruzel M., Lipczyński T., Prys M. (2021) Framework of visual literacy competencies for engineering education discussed in the scope of DigComp framework with examples from educational R&D projects. Procedia Computer Science, 19, p. 4441.
[81] Visual Literacy for engineering education: newsletter 2. VLEE, p. 7.

on the level of education and its purpose. As part of the project, a model was developed that helps determine the required level of competencies and plan their development with the help of educational practices. In particular, three levels of visual literacy are proposed for engineering and professional education, according to which an individual's visual competence develops (basic, intermediate and competent). If at the basic level, learners learn basic visual and graphic practices and learn new concepts, then at the intermediate level they apply and expand these practices. The competence level implies the developed ability of the future engineering specialist to develop new practices following professional competencies, involving acquired knowledge and a critical attitude to existing practices[82].

16 digital competencies of VLEE visual literacy have been established, which are structured in 6 areas of technical professional's activity: 1. Use – find and access visual media effectively (select, use of visual, technologies). 2. Interpretation – critical interpretation, analysis and understanding of visual materials required (interpret forms, graphics, and data). 3. Analysis – analysis and evaluation of visual resources and data expressed by visual means (identify, evaluate). 4. Solving – use visual means for identifying and solving technical problems (visualize solutions, explore). 5. Creation – generation of visual representation and data (create form, create data, envision). 6. Communication – use visual information to exchange technical ideas, concepts, and problem solutions (describe functionally, share, express, and present)[83].

Thus, based on the analysis of various aspects of culture, the role of visuality in it and the professional activity of various profiles specialists, we present the following definition of a specialist visual culture. The visual culture of a specialist is considered as a dynamic multi-level system, which in its development goes through the stages of visual literacy, visual competence and education, which differ in the depth and breadth of the mastered visuality of professional activity. It accumulates the achievements of humanity in the field of creation, display, assimilation, storage and transmission of visual information about the objective world of the professional sphere. As a complex system, it integrates motivational-valuable, cognitive-active and evaluative-reflective components, the formation of which provides an opportunity to comprehend historical and cultural heritage in the professional sphere and develop the complex visual, creative and project abilities of a specialist. The main condition for the successful development of a specialist's visual culture is the continuous formation of visual experience in the context of professional activity and the self-improvement of a person.

Peculiarities of the visual culture of the individual are related to the influence of various factors, namely: dominant value preferences of a person, upbringing and education systems, demands of historical time, age and social specificity. For many types of human activity, visual culture is an important component of professional competence. In the process of long-term socialization of an individual, his model of visual perception is formed and improved, which in different age periods relies on different foundations: in preschool and junior school age – on visual representations, which are laid by visuality; in adolescence – to the visual image; in adulthood – a visual image supported by relevant knowledge and competences, reinforced by modern technical visual means. As a result of various influences, a visual attitude is formed in the human mind, which depends on the need to learn different visual systems and form a visual experience. As life itself has proven, art education contributes to a person's view of the world around him in a slightly different way than people without such training see it. This is because the study and research of artefacts of visual culture, visual schemes and norms develop visual abilities and thinking. In this regard, V. Kintsans

[82] Guide to the Visual Literacy for Engineering Education. Competence Framework. (2019) VLEE, Erasmus+Programme of the European Union, p. 45.

[83] Różewski P., Kieruzel M., Lipczyński T., Prys M. (2021) Framework of visual literacy competencies for engineering education discussed in the scope of DigComp framework with examples from educational R&D projects. Procedia Computer Science, 19, p. 4443.

notes: "Works of fine art are, as it were, keepers of visual experience. They are not just visual cultural and historical evidence of the peculiarities of vision, but also products of visual consciousness"[84].

In real life, we come across different types of semantics, with the help of which you can form an idea about the features of the visual culture of different people. Examples of semantics:

Aged. What an older person will see can be deeper, and more meaningful, because he has significant life and visual experience. The same visual image may mean nothing to a young person, while it has significant value to an older person. And it can be the other way around.

Professional. A picture, drawing, or diagram as a visual object is best understood by a specialist or a person trained in this subject. Conversations of specialists are filled with terms, the meaning of which is not always known to the average person, so he cannot imagine the subject of the conversation. To do this, she needs to delve into the specific professional content, and familiarize herself with its visual possibilities.

Subcultural. In the process of the historical development of the subculture, along with the change of ideology and preferences, its symbolism was transformed. It performed a double role: on the one hand, it testified about belonging to a subculture, and on the other hand, it characterized the position of a person in the cultural field. Since there are many subcultures, including political, social, sports, educational, etc., they have a rich symbolism, which is manifested in clothes, hairstyles, accessories, speech, musical styles, and lifestyle.

National. To avoid some ambiguities in the understanding of culture, it is considered as the culture of a certain field of activity, or in the context of achievements in different fields of activity. In the first case, we are talking about those spheres of activity where the meaning of "national" has no meaning, for example, in physics, chemistry, mathematics and other scientific spheres, the foundations of which are the same for all. In the second case, with the artistic spheres of activity, we can talk about the culture of painting, music, ballet, design, and architecture, which reflect national achievements.

On a time scale, slow changes take place in society, which affects public consciousness. They are manifested in a change in lifestyle, artistic styles, mentality, "wandering" plots, symbols and ideas. With the increase in the number of internal incentives, the possibilities of national culture expand. Borrowing cultural assets and their assimilation through the prism of national characteristics often contributed to the emergence of unique achievements, in which, thanks to one's innovations, other people's forms changed, thereby enabling the realization of mature opportunities. This is how, for example, the Ukrainian architectural style "christened crystal temple" appeared, which "developed the traditions of wooden architecture, used the form of baptismal columns in Kiyvan Rus'churches of Byzantine origin and formed a stylistic unity with Western baroque sculpture"[85].

Other national semantics are related to symbolism. Every language has components-symbols that strengthen and increase the intensity of the sign. The understanding of the symbol has its specifics, which reflect everyday life, morality, social relations, production activity, the natural environment, the uniqueness of the plant and animal world, etc. Since symbols can be nationwide and national, each nation, having assimilated the general system of images-symbols of the world, interprets them at the expense of its national-cultural component. To know the spiritual universe of a nation, a thorough understanding of the figurative and symbolic content of those elements that record customs, traditions, worldview, as well as the names of phenomena and objects of the environment, everyday life and culture is required. Components-symbols, through linguistic meanings, participate in the formation of cultural codes, the integration of which determines the mentality of the people.

National semantics include symbols, national colours, themes, motifs and plots. Today, language, national symbols and heroes, and religious beliefs are the sacred attributes that embody the culture, traditions and historical memory of the people. Colourful folk symbols, like allegory and metaphor, form figurative meanings based on the similarity or affinity between certain phenomena.

[84] Kintsans V. (2016) Visual culture: analysis and ways of formation International Scientific and Practical Conference. World Science. No 7 (11), p. 33.

[85] Popovych M. V. Kultura v rozmaitosti poniat, yavyshch i skhem postupu. Entsyklopediia istorii Ukrainy.

An example of national semantics is the blue-yellow colour of the Ukrainian flag, where blue is associated with the sky, and yellow with a wheat field. In the Ukrainian cultural sphere, other examples of semantics are "viburnum", "marigold", "embroidered towel", etc.

In the context of visual culture development, O. Selivanova's remark that an image is a psychological phenomenon, while a symbol is a stable functional category of culture, is important. Therefore, in culture, the symbol has a higher semiotic status and performs powerful integrative and regulatory functions. Based on deep associations, the symbol collapses various conceptual spheres and becomes culture-rich[86].

Characteristic features of symbols are saturation of information with simultaneous simplicity, ambiguity, ability to a high degree of generalization, and ability to visualize deep meaning and ideas.

An image is the simplest element of knowledge that a person receives. In the future, it needs verbal processing. But, as practice shows, this is not always easy to do. If for the verbal method there are reference books (even better – specialized ones) where you can find explanations of words and concepts, then for the visual method this problem exists and needs to be solved. Knowing what types of information there are, you can get a more or less complete information picture in different environments. And here visual information helps, which reflects: the reasons, the constructive function of the visual, communicative processes and social actions. Visual information indirectly contains the following subtypes of information about the reasons (cultural and social) why the object came into view (of an artist, engineer, teacher, etc.); the constructive function of the visual in the process of both its creation and perception; communicative processes for which this image becomes an informational message; social actions, the catalyst of which is the image.

In practice, when meeting with a visual image, integrated knowledge from many fields is involved – philosophy, psychology, cultural studies, design and professional activity, which are refracted through the subjective. For semantic reconstruction to take place qualitatively, it is necessary that the vision of the author and the viewer, converge. The basis for this reconstruction is provided by phenomenology and hermeneutics of design. Therefore, it is essential what kind of message viewers "read" in visual information.

Today, when perceiving visual images, there is a tendency when the viewer (recipient) wants to make a minimum of effort when perceiving the meaning, and wants here and now. With such a production, the beauty of the picture, novelty and unusualness, the play of reality and illusion come to the fore. Often, the artist thinks about how and what to "touch" the viewer. The works are given beautiful, meaningful names, but they are essentially primitive.

Each type of visualization has its characteristics, corresponding criteria are formed for it. But despite everything, there should be a clear goal and tasks that its appearance solves. Its value as an artefact depends on its level.

Unlike verbal forms, visual forms can be simple and concise, but for this, maximum stylization is required. At the same time, it is necessary to remember what kind of emotional colouring and meaningful message the artist gives to the viewer since the attention and memorization of the viewer depend on them. And also, which audience and its values the artist is counting on.

A visual image is created to be known and interpreted. Unlike text, a picture should be easily read by people of different cultures, and a visual language should have the ability to read codes equally by people of different cultures.

Currently, the methodological research of the visual is reduced to the use of the mechanism of verbalization, which unarchives the content and creates a narrative. In this aspect, the psychological structure of the concept helps to understand this thesis.

Conclusions. The modern world has become visual, as it allows you to see not only the visible but also to dive deep into objects with the help of various optical devices, to penetrate the imaginary world with the power of visual thinking and reflective techniques. Visuality is a cultural construct that integrates many discourses, each of which has its purpose, task, language and context, means and techniques, it must be studied in the habitat. Visualization exerts a communicative influence through

[86] Selivanova O. O. (2008) Suchasna linhvistyka: napriamy ta problemy. Poltava: Dovkillia; K, p. 297.

instant semantic capture and identification of accented features. This allows you to show non-obvious ideas, reveal clear connections in complex concepts and summarize information in the form of expressive images recorded in various types of drawings (diagrams, drawings, photos, tables, paintings). Discourse is considered as a method of perceiving and explaining the "inexpressive", and discourse as a process is associated with the readiness of modern man to "play" thoughts, ideas and language to find the most perfect options.

Since the visual system transforms and integrates human sensory experience at the perceptual level and the level of ideas, the question arises about the ontological load of images, and their correspondence to reality. The relevance of this issue is determined by the fact that a system of ideas is formed through a visual image in thinking and it becomes possible to interpret complex intellectual constructions. If a person loses the ability to independently generate the meanings of images, to "see with the thought", then his imaginary sphere is filled with illusions and a fragmented consciousness is formed. To find a clear meaning of the image, its visual-figurative and logical-verbal components are used. In the presence of a single concept, it fits into an understandable value model.

The formation of a person's ability to work with visual materials involves a step-by-step process in which he moves from the level of visual literacy to visual competence. Since real visual practices change over time, the acquisition of visual experience and the improvement of visual culture is an urgent need.

Different professional fields have different requirements for working with visual materials. Modern information and communication technologies have significantly expanded the possibilities of working with them, allowing them to reveal the visuality of not only material objects but also virtual ones, contributing to the emergence of new forms of visual mass communication. Peculiarities like professional activity leave an imprint on the understanding of the essence of the specialist's visual culture. Therefore, today, when studying the visual culture of specialists, and therefore visual literacy and competence, they try to prescribe digital visual competencies in the main areas of professional activity (use, interpretation, analysis, problem-solving, creation, communication). The main elements of visual culture are concepts, attitudes, values and rules.

Further studies of the specialist's visual culture will be aimed at determining the methodological foundations of the visual culture formation and highlighting the best educational practices.

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