CHAPTER «HISTORY OF ART»

MEANS OF FORMING INFORMATION AND COMMUNICATION SYSTEMS IN THE DESIGN OF THE INCLUSIVE SPACE OF THE SCHOOL

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Abstract. The article is devoted to the analysis of means of formation of information and communication systems taking into account inclusive design. The constant development of innovative project developments in this direction indicates a change in conceptual approaches to their design and the urgency of changing the paradigm of inclusive education, which takes into account accessibility and safety for all students without exception. The system approach allowed to establish connections between the ergonomic component of the formation of the design of information and communication systems, their functionality and aesthetic expressiveness. The method of abstraction helped separate from certain properties and relations of the object and at the same time focus on those properties that are the direct object of scientific research; the method of generalization contributed to the logical completion of abstraction; the method of classification allowed to determine the specific characteristics in solving the problems of the best examples of project activities with the possibility of their theoretical justification. The social significance and relevance of the chosen research topic lies in the analysis and identification of fundamentally new design solutions for the educational space of secondary

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schools, which have been implemented in foreign countries. Characteristic features of their solution are taking into account the principles of universal (inclusive) design based on the use of technological innovations, availability of spatial planning, design and artistic solutions, which significantly improve the implementation of information and communication systems. Functional comfort, in this case, is considered as a generalized criterion for optimizing the system «human-object or process-environment». In addition, the inclusive approach takes into account the comfortable and aesthetic conditions of students' adaptation to the new modern standards of education and testifies to its practical significance. It is a special synthesis of ergonomics and design in the educational environment, and also allows you to create new «scenarios» of educational activities of modern students. Analysis of aspects of the developed design model of an inclusive approach in solving information and communication systems will help initiate its implementation in the educational space of secondary schools of Ukraine.

1. Introduction

Innovative teaching methods, which are inherent in the Concept of the New Ukrainian School, should provide conditions for the realization of the child's individual abilities. Following the latest Orders of the Ministry of Education and Science of Ukraine, in which the primary task is to reform the New Ukrainian School, it is necessary to determine the difficult but very important formation of a new form of society, where every child with disabilities has an equal place in education schools.

For the last 10-15 years, scientists around the world have been trying to solve the problem of involving children with disabilities in society, helping them to be useful to the state and, in general, to improve their quality of life. One of the areas to address these issues is information exchange, secure communication and student navigation. The results of the work of architects [4] and specialists in design psychology [1], who studied this problem, showed that in today's conditions, the solution of the design of the educational space should take into account several main tasks, namely: 1) functional (information and communication, navigation); 2) aesthetic; 3) psychological; 4) social. So, first of all, to create a quality communicative space, it is necessary to identify the main aspects that have an impact on the disclosure of the conceptual idea, taking into account an inclusive approach,

namely: 1) the area and size of the study space; 2) planning decision of the premises; 3) functional subject filling of the room; 4) features of the state of health of students; 5) their age category.

In their turn, the authors of the article «Harmonization of the inclusive environment of secondary school on the basis of the concept of» Phiophilic design» analyze no less important criterion for the formation of the design of educational space that meets environmental standards of today. Researchers K. Katrichenko, O. Vasina and S. Kryvuts emphasize that the emphasis on the design of the natural environment as a learning space significantly improves the level of psychophysiological indicators in the process of teaching students with autistic problems and children with visual impairments. An important result of these studies is the conclusion that the concept of «Phiophilic design»: «…takes into account two functions: rehabilitation and social adaptation, which are extremely important for children with autistic disorders» [5, p. 24].

The above aspects are basic and provide: psychological comfort of students, ease of perception of information, promote socialization and communication of children with special needs; improve navigation processes. In her turn, T. Yezhyzhanska, the author of the article «Visual communication», emphasizes that communication channels provide movement in physical space and in astronomical time [3]. The researcher believes that visual communication is a movement of messages in the social space by simple, clear and accessible means. It should be noted that today there is a formation of fundamentally new conceptual approaches in the design of information and communication systems, which entail a change in methods and means of their design. Professor B. Stolyarov in his works emphasizes the urgency of solving problems of visual culture, using various information channels [11]. The author reveals the main components of visual culture that have an impact on the logic of perception of the environment. The formation of long-term messages is one of the main features of visual communication [8]. Information messages are the result of various forms of coding: verbal, nonverbal or written [10]. It is desirable to identify effective factors that are prone to development in the information and communication space and contribute to behavior change for effective communication. In turn, the importance of redevelopment of educational facilities to enhance learning processes is one of the main issues of modern researchers [2]. To improve the

design of the learning space, it is desirable to pay attention to three topics, namely: 1) combining the interests of students; 2) the optimal rhythm of perception of information; 3) activation of holistic learning [8]. One of the tools in this case is assistive devices and technologies that promote inclusive learning, regardless of whether the child has a physical disability or visual impairment, etc. [11]. Professional design of educational institutions taking into account the inclusive approach provides a reasonable placement of all necessary information and communication systems that help attract students. Thus, the effectiveness of professionally designed visual information and communication design determines the logic of the proposed messages by means of color, fonts, lighting and more. Implementing them in educational facilities can help determine the level of inclusiveness in each specific project proposal. For example, at the beginning of the 21st century, the social need for a developed system of graphic, tactile, interactive or sensory communications has helped rethink the design of information signs based on the principles of universal design and introduce new tools that make it accessible to all students without exception. Changes in their design force a detailed analysis of current trends in the creation of project proposals for the educational space of the school, taking into account an inclusive approach.

2. The Factors of information support

It should be noted that the requirements for the criterion of informativeness provide the formation of conditions that reduce the manifestations of stressful situations in students with disabilities, ensure the comfort of navigation processes and include the following aspects: 1) the use of information appropriate to the health of students; 2) timely recognition of landmarks in the architectural environment of the educational space of the school; 3) accurate identification by the student of the current location and places, which is the purpose for their future movement; 4) the ability to have continuous information support throughout the passage of the building. In addition, to achieve the desired results in the formation of the visual accessibility of the elements of information support must take into account the following factors:

– the distance from which the message can be effectively perceived;

– angles of the field of view, convenient for the perception of visual information by students of different ages;

– clarity and quality of the image, its contrast to the environment;

– relief of the image (to facilitate the adoption of children with visual impairments);

– conformity of the used symbols or plastic receptions to the standard value;

– increased size of the character or text message;

– reducing the number of visual details of the graphic image; 8) the use of one or only two strong colors;

– development of design of symbols that differ significantly from each other in their shape and color;

– elimination of obstacles to the perception of information media (flashing pointers, dazzling lighting, a combination of areas of action of different acoustic sources);

– increase the light where the information is provided. The constant influence of a developed information system can lead to the introduction into the minds of children of new socio-cultural values and aesthetic ideas.

So, let's analyze the main criteria for building the design of information and communication systems in the formation of the educational space by graphic, tactile means or means of interactive technologies.

3. Formation by graphic means of information system

Graphic visual system is the most common means of transmission and perception of relevant information. It is worth noting that among the many tools that help solve the graphical function of the navigation function in the design of the learning space, you should determine the color and methods of its use. Researchers G. Freeling and K. Auer, who studied the problem of color and its impact on improving thinking in children, point out that painting the school space with dark or "cold" colors significantly reduces students' perception of the necessary information and, conversely, "warm" colors light tones provide a comfortable perception of space [13]. Visual perception of the subject-spatial environment by a child with visual impairments has a deviation of visual functions. Researcher G. Havhun in his article "Graphics in the interior" [14]. notes that graphics in the formation of interiors – is a very complex task that reveals the presentation function, indicates the direction of movement of visitors and can be an icon indoors. Thus, the graphic culture of providing information

that meets the needs of visually impaired students is one of the means of solving the problem of visual communication in the school space, they are perceived as informational assistance in addressing issues of orientation and, subsequently, in socially oriented activities (Figure 1).

Figure 1. Browns Point Elementary School, TCF Archirecture

The diversity of visual graphic communication systems in the formation of inclusive design can be analyzed on the example of Lake Wilderness Elementary School (Maple Valley, WA). The method of structural organization of the educational space of Lake Wilderness Elementary School with an emphasis on the detection of visual logic is based on a graphical means of providing information, which is solved quite harmoniously and aesthetically (Figure 2). Bright color accents highlight the necessary functional areas and provide attention throughout the navigation process due to the following components:

– *on the floor*: with the help of colored spots and stripes, provided taking into account the reception of color contrast by local type of location (this technique helps children with poor eyesight or autistic disorders to feel safe and move freely in a given direction);

– *on the ceiling*: additional graphic presentation of information is offered in the form of a lamp with elements of typography;

– *on the walls*: each transition from one zone to another is marked with a contrasting color along the entire perimeter of the room based on the spatial type of their solution. However, in the corridor area, two contrasting colors are proposed, which are part of the same continuous line of walls. In this case, the unity of the color scheme of the walls helps to focus students' attention on information elements in the form of tables, drawings and photos that are at the level of visual perception.

Figure 2. Lake Wilderness Elementary School

To determine the function of navigation in the formation of the design of the Peter G. Schmidt Elementary School (Tacoma, WA), the architects of TCF Architecture use the collage method. This method allows you to combine in one room several information accents, which are decided by the local type of their location: photos, text messages, active use of bright colors and embossed materials for fencing. First of all, we should pay attention to the definition of the principle of safety, which is one of the basic principles of universal design, proposed by architect Ron Mace. Therefore:

– *on the floor*: the source of the pictorial material, which immediately attracts attention, is a bright color. The general composition with the use of colored linoleum is based on the construction of radial elements of geometric shapes, which are created by the local type of their location and indicate the main functional areas of the room;

– *on the ceiling*: there are elements of infographics that are brightly lit and provide information about the main directions of movement. If we define the main functions of infographics, which, in this case, greatly simplify the perception of information in school design, we should name the following: 1) illustrative: implemented when achieving originality and attractiveness of design; 2) cognitive: a) is manifested in the structuring and systematization of information, which is solved in the design of icons; b) combines elements of figurative and abstract solutions; c) reveals the integrity of the perception of infographics; solves the problem of activating the associative string; 3) communicative: forms a visual order to action, to implement the necessary recommendations by students;

– *on the walls*: various means of determining additional information are offered: 1) a panel with a photo image on the theme of work that is inherent in this area; 2) the other part of the wall, which is solved in dark colors, has color informational text messages, developed on the basis of the reception of an enlarged scale and highlighted in a contrasting color; 3) no less important for the improvement of orientation in the space of children with impaired vision is the presence of a textured surface in the walls; 4) the solution of a decorative graphic panel, which greatly simplifies the perception of changes in the architectural space of the school.

In this case, the use of works of art in the form of decorative panels is an integral part of the modern design solution of the information and communication system of the interior of the school (Peter G. Schmidt Elementary School) and corresponds to the principle of humanization. Thus the basic receptions of its decision reflect their multipurpose value, namely:

– *artistic techniques*: the method of organizing the image in combination with the technique of stylization (help to solve the navigation function based on the graphical information component). Stylistic expressiveness of decorative images on a natural theme is due to the formalization of elements of natural leaves and flowers. The conciseness of the graphic language and the absence of unnecessary decorative elements facilitates easy understanding of the required information;

– *psychological techniques*: 1) have an effect on relieving stress, which can be high enough for children with health problems. The authors of the project decided that graphic accents should be clear and concise; 2) wall murals of the corresponding color scale provide confidence in correctness of the chosen direction; 3) the calm development of "events" of the plot line of murals helps to establish a therapeutic effect for students with autistic disorders and children with poor eyesight; 4) creating a decorative panel by means of graphic design, the authors of the project comprehensively solve aesthetic problems of architectural and environmental design, which are based on the principle of transformation and contribute to the formation of a positive emotional state of all students without exception.

4. The tactile information and communication system

The next tool, the tactile information and communication system, in the design of the inclusive educational space of the school is developing in the

direction of "man-society" and must take into account the urgent needs of today. According to the visual material of the study, its main properties are solved on the basis of two approaches:

1) creation of tactile graphics of symbols or text messages due to the transformation of graphic versions of images (felt to the touch due to the use of Braille fonts: when making maps, diagrams, tables, icons, didactic teaching material, font messages;

2) tactile indicator message in school interiors (based on the feeling of pressure on the surface and related to obtaining information through the skin and proprioption of joints).

It should be noted that according to research the tactile information received its development in parallel with the development of visual communication. Its significance is almost universal, because a person can not only focus on tactile perception of information, but also feel socially adapted. In addition, scientific works of specialists in various fields prove that psychological safety is very important for students with visual impairments, so one of the urgent tasks of today is the process of professional design of tactile information and navigation systems. For example, the article by A. Kochneva and M. Pankina [6] provides a meaningful analysis of solving problems of tactile perception of information. The authors emphasize the tactile properties of materials used in interior design while maintaining their overall concept and emphasize the variability of tactile characteristics in the design of a quality system of design communication. Given the above, the necessary analysis in the design of information and communication systems of the educational space of the school requires the definition of the following components: 1) means of providing tactile information; 2) methods of compositional solution of tactile navigation systems; 3) taking into account the age category of students (for a more convenient perception of tactile information and communication structure).

The main purpose of the *first approach*, namely – the creation of tactile graphics of symbols or text messages is: the development of students' communication skills, improving the organization and perception of educational material, the use of alternative means of communication and its improvement. The main criteria for its solution are:

– combination of design of two- or three-dimensional models of symbols-signs with the provision of tactile information in Braille;

– clear design of tactile diagrams, maps or tables without unnecessary additional elements, which are usually used in the graphic version of messages (clear formulation of tactile graphics, corresponding to the main text of the graphic analogue). For the effectiveness of the design of the above tasks, the authors of the projects use the following special methods:

• *method of stylization*, due to which on the basis of various methods of shaping the generalization of the necessary images-signs is carried out. For example, on the basis of analogies the tasks of editing or replacing the silhouette of the general form, its elements, details (graphic or plastic means) are performed;

• *method of formalization* that requires consideration of the level of abstraction of given elements or geometric figures of the information sign system;

• *method of combination*, due to which the solution of the general composition of information symbols (iconography, icons, etc.) is formed on the basis of combining planar and three-dimensional-plastic forms.

It should be noted that among the types of tactile communication with the help of symbols, the following means should be mentioned: 1) graphic-tactile images-signs that have characteristic elements of Braille fonts; 2) abstract tactile plastic compositions; 3) font tactile compositions of information systems of local or spatial types of location in the internal space of the school (for example, the School of Discovery Elementary; Elementary Knop school of law).

The second approach, rational, which reflects the relevance of the formation of tactile information and navigation systems in the design of inclusive learning space, reveals its potential through the use of tactile indicator elements that improve the level of navigation system for visually impaired students. Tactile-bodily-spatial perception is based on direct tactile sensation. Among the criteria for the perception of the above tactile navigation system should be mentioned:

– absence of superfluous architectural designs;
– mutual arrangement of relief forms;
– a combination of different materials;
– quality of processing of textured surfaces;
– light and color spatial and plastic properties of the interior.

The compositional organization of the space of the secondary school, in this case, is characterized by the activation of functional processes

and is solved by architects and designers on the basis of the following principles:

• *the principle of expediency*: is responsible for the choice of means and methods of forming a tactile information and communication structure, taking into account the health of students with visual impairments (example of a design concept in the design of Skovbakke School (Figure 3), Bergen School and Hazelwood School);

• *safety principle*: takes into account the ability to move in the required direction (Skovbakke School design, Anchor Center, Hazelwood School design (Figure 4), Bergen School design). These examples indicate the professionalism of identifying the tactile qualities of objects characterized by the activation of the communicative function;

Figure 3. Skovbakke School

Figure 4. Hazelwood School

• *the principle of creativity*: which solves the problem of choosing an artistic image for the formation of tactile design communication that meets modern social and art requirements (example of the Bergen School (Figure 5), Lyndon Bennett School design).

It should be noted that the main tactile varieties that provide orientation in the learning space and simplify social and domestic orientation are the following:

1) a combination of graphic and tactile warning indicators in areas of change of direction (design of the Skovbakke school). The contrasting color of the stripes on the floor directs the movement of students along the required functional areas; in turn, the use of tactile indicators in the areas of the stairs greatly facilitates the orientation in space, leads to safe movement and promotes the socialization of visually impaired students;

2) tactile warning indicators in areas of change of direction (school design for girls, Melbourne; Bergen School design (Figure 5).

Figure 5. Bergen School

An example of solving the design of the school space in Bergen allows us to reveal the functional-utilitarian and aesthetic qualities of modern schools. The use of TacPro® stainless steel tactile tactile studs on the floor allows visually impaired students to move mobile and indicate the existing priority in choosing the desired direction. In this case, priority is given to professional modeling of the main passage zones and changes in the direction of movement along the perimeter of the architectural space. The tactile indicator message also meets modern aesthetic requirements and is both safe and convenient for school users. The above tools improve their intuitive perception by visually impaired children and promote mobile mobility;

3) tactile warning and guide strips in front of the transition areas (design of Skovbakke school, school for girls, Melbourne, school in Bergen);

4) tactile and plastic properties of floor and wall surfaces (W. Ross MacDonald School; Whitby Shores School; Hazelwood School; Sandal Magna School);

5) thematic tactile compositions on the walls, which are the main accents in the overall design organization of the interior (Lyndon Bennett school design);

6) relief-plastic properties of floor surfaces with an additional element of illumination in zones of change of the direction of movement (design of the Anchor Center). Therefore, tactile means involve the transmission of information by feeling the touch or pressure on the surface. They play an important role in the interaction of students with the learning environment by signaling the presence of any stimulus in contact with their body.

5. The interactive information support in the design of the educational space

The third approach, interactive, which in today's conditions significantly improves the formation of a new form of socialization of students with special needs, is characterized by the emergence and rapid development of innovative technologies. They have an impact on positive changes in the design of the school's educational space, namely – help to solve the information and communication function and help to identify the artistic image of a modern school. Thus, the virtualization of information and communication systems in the design of the interior of the school indicates a promising trend of disclosure of the author's concept, taking into account its inclusiveness. An important criterion here is the professional presentation of the necessary information, which changes its perception at the levels of consciousness and subconsciousness. This approach involves a new attitude to learning processes, its intensification; takes into account the possibilities of independent analysis of the received information and its mastering through new media devices and digital technologies by all students without exception. Due to the above formation of information and communication systems acquires new strategies, properties and innovative methods of visualization of educational materials and solutions to navigation issues.

The main factor in the use of interactive technologies in the context of changing approaches to the educational process and the design of the educational space is the need to transform the traditional education system into a more modernized strategy for the presentation of educational material. The result of its successful implementation are: 1) intensification of the educational process; 2) improving the independence of students; 3) improving cognitive activity; 4) formation of creative skills; 5) accelerating the process of adaptation of students with special needs. Let's identify and analyze several new trends in the creation of important examples of interactive means of obtaining information that are relevant and, most importantly, they have found positive confirmation in the design of the educational space when used by children with disabilities.

Example, portable multi-touch-interactive touch screen: has a protective panel against glare for any lighting conditions in the learning space, allowing students to clearly see the content, no matter where they sit and what health features they have. The main advantages of their use in the design of the classroom are the following: the clarity and brightness of the

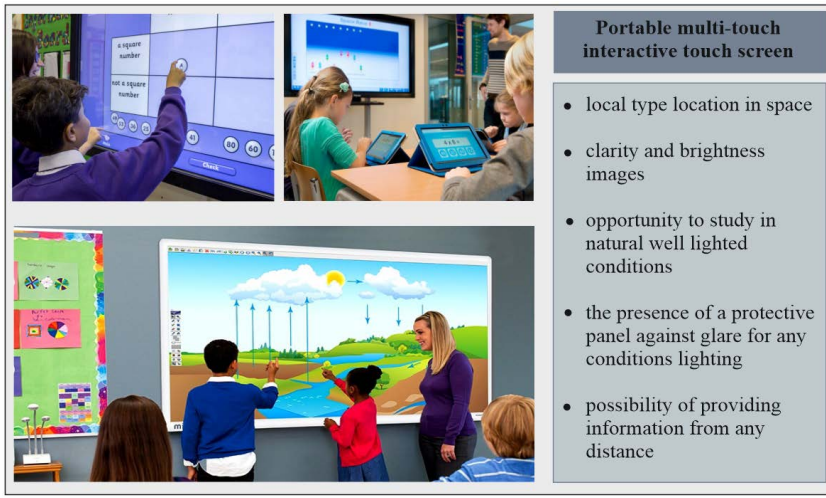

Figure 6. An example of the use of a portable multi-touch interactive touch screen in classroom design

Source: author's composition of figure

image, the absence of shadows and noise, the ability to learn in natural well-lit conditions of the classroom (Figure 6).

A striking example of the integrated inclusion of interactive innovations is the design of the educational space of the Hazelwood School in the UK (Figure 7). According to the concept of the designers of the TaskSpace studio, the following is proposed: 1) individual lighting of the room with

Figure 7. Hazelwood School

Source: author's composition of figure

different color effect in different functional zones of the class; 2) virtual reality system; 3) Lego construction wall; 4) several interactive projections for the floor and walls; 5) area for robotics training. This set of interactive developments helps to create a design of the learning space on the principle of flexibility and take into account the latest technological innovations to identify an inclusive approach. In addition, the design of the classroom is designed to develop students' creative thinking, improve their psycho-physiological performance and accessibility to increase digital awareness of all students without exception.

6. Conclusions

1. Thus, the transfer of the author's idea of information and navigation message has a combined nature of its creation and helps to emphasize the geometric simplicity of school premises, focus students' attention on important functional areas, consistently reveal the content of information messages by various artistic and compositional means. In addition, the intertwining of modern printing technologies, the expressiveness of iconography, decorative panels, comparison of abstract abstract-symbolic images realistic – all the above components prove that the design organization of the educational space of secondary school of the early XXI century has a new trend, which in the complex of all signs is responsible for the safety, harmony and comfort of all students without exception based on an inclusive approach.

2. It is proved that the formation of tactile information system in modern conditions develops on the basis of two approaches: the first – improves information and communication function by creating tactile graphics of symbols or text messages by transforming graphic versions of images. The second approach is responsible for the navigation function and helps to solve the tactile indicator message in school interiors, which is based on the sensation of vibration, movement, surface pressure, temperature difference and is related to obtaining information through the skin and joint proprioption. Focusing on the design of interior design with the help of tactile indicators completely solves the problem of distance of students with special health, making their daily life more communicative and full of positive emotions.

3. It is determined that the virtualization of internal space by means of interactive technologies indicates another promising trend in the formation

of school inclusiveness. The professional presentation of the necessary information becomes important here, which changes its perception at the levels of consciousness and subconsciousness. This approach involves: a new attitude to learning processes; intensification of the supply of educational material; takes into account the possibilities of independent analysis of the received information and its mastering through new media devices and digital technologies by all students without exception.

4. Thus, the combination of the above proposals for the design of information and communication systems and navigation structure allows to identify their functional load and reveal the importance of the aesthetic component in the design of modern educational space.

References:

1. David Abram (1997) The Spell of the Sensuous: Perception and Language in a More-Than-Human World. New York: Vintage Books.

2. Davison Munodawafa (2008) Communication: concepts, practice and challenges. *Health Education Research*, vol. 23, issue 3, June, pp. 369–370. Retrieved from: https://doi.org/10.1093/her/cyn024

3. Yezhyzhanska T. (2012) Vizualna komunikacia. Informatsia, komunikacia, suspilstvo [Visual communication. Information, communication, society]: materials of the I International scientific conference, pp. 30–31. Lviv: Polytechnic Publishing House. (in Ukrainian)

4. Juhani Pallasmaa (2005) The Eyes of the Skin: Architecture and the Senses. West Sussex, England: Wiley. Retrieved from: http://cccatalogo.org/site/pdf/Pallasmaa_EyesoftheSkin.pdf

5. Katrichenko K.O., Vasina O.V., Kryvuts S.V. (2021) Garmonizatsia inkluzivnogo seredovyhsa zagalnoosvitnioyi shkoly na osnovi kontseptcii «Biophilic design» [Harmonization of the inclusive environment of secondary school on the basis of the concept of "Phiophilic design"]. *Bulletin of the KSADA*, pp. 21–29. Kharkiv.

6. Kochneva A.S., Pankina M.V. (2019) Evolyutsiya taktilnosti v dizayne: istoriko-kulturnyiy analiz [The evolution of tactility in design: historical-to-cultural analysis]. *Culture and Civilization*, 9 (3-1), pp. 156–167. (in Russian)

7. Kryvuts S.V. et all (2021) The phenomenon of digital art as a means of preservation of cultural heritage works. *Muzeológia a kultúrne dedičstvo (Museology and Cultural Heritage*), vol. 1, issue 9, pp. 145–156.

8. Melissa L. Rands, Ann M. (2017) Gansemer-Topf. The room itself is active: how classroom design impacts student engagement. *Journal of Learning Spaces*. vol. 6, no. 1.

9. Pocheptsov G.G. (2001) Teoria obshenia [Theory of communication]. Retrieved from: http://socium.ge/downloads/komunikaciisteoria/pochepcov%20teoria%20komunikacii.pdf (in Russian)

10. Radhika Kapur (2020) The Process of Communication September. Retrieved from: https://www.researchgate.net/publication/344187652_The_Process_of_Communication

11. School Design and Construction, UNICEF. Retrieved from: http://www.unicef.org/education/index_56204.html#resources

12. Stolyarov B.A. (2015) Rozvytok vizualnoi kultury uchniv muzeiu [Development of visual culture of students of the museum]. *Art pedagogy.* Retrieved from: http://www.art-education.ru/sites/default/files/journal_pdf/stolyarov_46-59.pdf

13. Freeling G., Auer K. (1973) Chelovek – tsvet – prostranstvo [Man – color – space]. Retrieved from: http://padabum.com/d.php?id=46969 (in Russian)

14. Havhun G.M. (2015) Interyerna grafika [Interior graphics]. *Modern problems of architecture and urban planning*, issue 38, pp. 108–114. (in Ukrainian)