UDC 371.13

U. S. Kirykava
Institution of Education "Baranavichy State University", Baranavichy, the Republic of Belarus, kirikovavladislava@gmail.com

MODERN TRENDS OF EDUCATION IN VISUALIZING INFORMATION

This article explores the transformative impact of visual communication on education, focusing on the evolution of visualization tools and their role in enhancing the learning experience for students. The main idea revolves around the key trends of Prosumerism, knowledge management, and platform services, which shape the future of education by promoting active student participation and knowledge creation. The results highlight how these trends are driving a shift towards learner-centered teaching, fostering engagement, and improving learning outcomes through the integration of digital tools in educational processes.

Key words: visualization; high education; education trends; prosumerism; knowledge management; platform services.

В. С. Кирикова
Учреждение образования «Барановичский государственный университет», Барановичи, Республика Беларусь, kirikovavladislava@gmail.com

СОВРЕМЕННЫЕ ТЕНДЕНЦИИ ОБРАЗОВАНИЯ В ОБЛАСТИ ВИЗУАЛИЗАЦИИ ИНФОРМАЦИИ

В данной статье рассматривается преобразующее влияние визуальной коммуникации на образование с акцентом на эволюцию средств визуализации учебного материала и их роль в повышении эффективности обучения студентов. Основная идея сосредоточена на ключевых тенденциях, таких как просьюмеризм, менеджмент знаний, сервисные платформы, которые способствуют активному участию студентов в формировании знаний. Результаты данного исследования отображают, как эти тенденции помогут осуществить переход к преподаванию, ориентированному на ученика, стимулировать вовлеченность учащихся и улучшить результаты обучения за счет интеграции цифровых инструментов в образовательный процесс.

Ключевые слова: визуализация; высшее образование; тенденции в образовании; просьюмеризм; управление знаниями; платформенные сервисы.

Introduction. Visual communication stands at the nexus of modern education, serving as a catalyst for innovation and engagement in learning processes. As humans are inherently visual creatures, the integration of visual elements into educational paradigms has become increasingly prevalent. This article embarks on a journey to explore the multifaceted impact of visual communication on education, tracing its evolution from traditional pedagogical methods to the digital age. By delving into emerging trends and innovative practices, this article aims to provide a comprehensive understanding of how visual communication is shaping the future of education.

Main part. Visualization, in the context of education, is the process of making information more accessible and engaging through visual means. It is a powerful tool that has found its way into various scientific disciplines such as construction, engineering, architecture, geography, and chemistry. The integration of digital technology in these fields has led to groundbreaking discoveries, the establishment of new principles, and a reevaluation of existing theories. From static diagrams to immersive virtual environments, the spectrum of visualization tools continues to expand, catering to diverse learning styles and preferences. In recent years, advancements in digital technology have fueled this expansion, enabling educators to leverage interactive simulations, augmented reality, and data visualization techniques to enhance the educational experience. This transformation has had a profound impact on educators, students, and pupils across different educational systems.

According to I. V. Izhdeneva, visualization is a way of ensuring observability of reality by representing visually perceived structures that imitate the essence of the object of cognition [1, p. 112]. However, visual information simultaneously undergoes various transformations as a result of psychological mechanisms of sensation, perception, representation, awareness, and understanding [2, p. 67].

E. Makarova states that “visualization serves as an intermediary link between educational material and learning outcomes. It functions as a cognitive-evaluative mechanism that enables the streamlining of the cognitive process, reducing extraneous details, and thereby enhancing and optimizing it”. The primary functions of visualization in the educational process include: facilitating the synthesis of

knowledge; visually and indirectly presenting studied phenomena in cases where visual perception is challenging or impossible; boosting students' motivation to learn by diversifying and making the learning process more engaging. From a didactic perspective, the use of visualization tools can fulfill both general and specific functions in education [3, p. 13]. Specific functions encompass motivation, clarification, organization, regulation, operation, explanation, empirical demonstration, ideographic representation, interpretation, and heuristic functions. General functions encompass informativeness, completeness, instrumentality, adaptability, and compensatory nature [3, p. 13].

One of the most significant advantages of employing visual materials in education is their capacity to enhance understanding and retention of complex information. Visual aids such as diagrams, charts, graphs, and images can simplify abstract concepts, making them more tangible and comprehensible. Moreover, studies have consistently shown that individuals remember information better when it is presented in a visual format. This phenomenon, known as the picture superiority effect, indicates that images are more likely to be stored in long-term memory than text alone [4, p. 4]. This enhanced retention is particularly valuable in an educational context, as it supports students in retaining knowledge for exams and applying it in practical scenarios.

Visual materials also play a vital role in maintaining student engagement. Modern students are accustomed to a multimedia-rich environment, and they often respond more positively to dynamic presentations. Incorporating visual aids into lectures, presentations, and learning materials can help maintain students' interest and enthusiasm for the subject matter. This, in turn, fosters increased participation, as students are more likely to interact with the material and contribute to class discussions.

The evolution of visual representation has significantly impacted the organization and outcomes of the educational process. From the emergence of written news to the development of printing, the publication of textbooks and pedagogical literature, and the advent of the internet and information technologies, the creation of visual teaching aids has undergone a remarkable transformation. These innovations have revolutionized the way we transmit information, making it more accessible and engaging for learners.

At the same time, changes in higher education, the inevitable consequence of which are reforms in the field of the content of general scientific and professional training, the creation of new models of education process, significantly expand the functionality of visualization tools. New tasks and functions of these tools appear in the context of the implementation of the so-called megatrends in education which reflect the ongoing changes in the structure and approaches to the organization of education. We claim that they determine the vectors and direction of the further development of means of visual presentation of information.

Simultaneously, changes in higher education necessitate reforms in the field of general scientific and professional training. This entails the creation of new educational models and processes, leading to a considerable enhancement of visualization tools. Subsequently, these tools have acquired new responsibilities and capabilities within the purview of implementing so-called megatrends in education. These megatrends represent transformative shifts in the structure and methods employed in education. Thus, it is asserted that these megatrends dictate the vectors and directions of further development in visual information presentation tools.

To identify the main trends in education related to visualizing information, academician Izotova conducted research, highlighting three key trends:

1. *Prosumerism:* The modern student is not just a consumer but also a producer of educational content. This trend emphasizes the need to involve students in creating visualization tools themselves, thereby enhancing their engagement and understanding.

2. *Knowledge management:* Students are actively engaged in gathering, structuring, and updating information, contributing to the continuous development of visual teaching aids.

3. *Platform services:* The integration of various services and educational products through platforms enables the presentation of information as a unified visual entity, enhancing the overall educational experience [4, p. 5].

The term “Prosumerism” was first coined by Alvin Toffler in his book “The Third Wave” to denote people who produce some of the goods and services they then consume themselves — for example by making their own clothes, building their own cars, or cultivating vegetables for their

kitchen [5, p. 311]. Toffler envisaged a time when consumers would increasingly play a role as co-collaborators in production and supply chains, with the capacity to alter the design and the attributes of a product they wanted. In higher education, prosumerism has led to a shift towards learner-centered teaching and learning activities. This approach emphasizes student engagement and co-production of knowledge, resulting in improved learning outcomes. Blended learning pedagogies, combining face-to-face teaching with digital tools, are increasingly used to support student engagement and content creation [6, p. 353].

In this regard, analysis of scientific studies and research results on visualization reveals and advances infographics as an educational tool with the greatest potential for implementing the megatrend that consists of students independently creating educational content for use in organizing their own activities, improving various speaking skills, and building interactions with other participants in the educational process.

In today's knowledge-driven society, individuals must constantly acquire and create new knowledge to stay competitive [7, p. 186]. This rapid ppace of change places a heavy burden on students, necessitating not only the ability to seek out knowledge but also to update it and prioritize it effectively. Moreover, skills related to knowledge creation, such as design, research, and information analysis, have become increasingly crucial [7, p. 186]. Equally important are the abilities to present processed information in a format conducive to further assimilation and analysis. These competencies, including problem-solving, product creation, and knowledge dissemination, collectively constitute "knowledge management" skills, or more precisely, knowledge self-management skills [7, p. 187].

In this context, an important skill involves transforming the information being studied into visual formats, intended for use as educational material not only by the students who generated it but also by their peers.

When talking about students' independent generation of educational content, a primary concern arises: how to select the most suitable service for crafting diverse types of infographic texts, equipped with an ample array of editing tools and options for presentation. In such instances, the teacher plays a pivotal role by acquainting students with various services through the provision of links

and concise descriptions outlining the features these services offer for generating visual content relevant to the subject matter being studied.

Infographics has the greatest potential for implementing this trend of independent creation of educational content, which can then be used to organize personal activities, improve various speaking skills, and facilitate interaction with other participants in the educational process.

In the context of language teaching, infographics have been variously defined as visual aids, means of instruction, methods of instruction, and principles of instruction. A. E. Basyrova argues that infographics are a form of information presentation that can be both a means and a method of instruction [8, p. 42]. She uses the term to refer to a way of presenting information, data, or knowledge using a combination of verbal and illustrative components, designed for the concise presentation of a topic under study and to improve the perception of information and encourage students to read it.

O. V. Khomenko discusses the problem of infographics as a type of visual content that is widely used in education. She considers what characteristics an object must have to make information accessible to perception: information value, accessibility of presented material, relevance of the information, and simplicity of presentation [9, p. 265].

Elements of infographics have great potential for teaching vocabulary in foreign language classrooms, expanding students' vocabulary, and developing speaking and writing skills. The creation of infographics involves students in developing knowledge management skills based on gathering, structuring, and arranging information into a visual product. This process involves the use of the main tendencies of visual representation of knowledge: generalization and concentration of knowledge, creation of a logical and semantic support, knowledge algorithmization, and information multicode presentation.

A variety of software applications can be used to create infographics, including MS PowerPoint, Prezi, Proshow, Canva, Pictochart, Wordwall, and others.

MS PowerPoint is a widely used tool for creating multimedia presentations. It offers a simple and flexible interface that allows users to easily add text, images, videos, and other elements to their presentations.

Prezi is a cloud-based presentation software application that allows users to create presentations with smooth transitions between slides. Prezi is particularly well-suited for presentations that include a lot of visual content, such as images and videos.

ProShow is a professional video presentation software application that allows users to create high-quality slideshows and video presentations. ProShow offers a wide range of features, including support for interactive text links and headings, editing tools for photos, and the ability to add animated captions and background music.

Canva is an online graphic design and presentation tool that offers a wide range of templates and design elements that can be used to create visually appealing presentations. Canva is a good choice for educators and students who want to create presentations that are both visually engaging and easy to understand.

Pictochart is a web-based infographic design platform that allows users to create visually appealing and information-rich infographics. Piktochart is a good choice for educators and students who want to create infographics to summarize complex information or explain concepts in a clear and concise way.

Wordwall is an online platform designed to create, share, and play educational games and activities. Wordwall is a versatile tool that can be used to create a variety of interactive learning activities, such as quizzes, flashcards, word games, and puzzles. Wordwall is a good choice for educators who want to engage students in a dynamic and interactive learning experience.

Beyond facilitating content delivery, visual communication plays a pivotal role in fostering critical thinking, problem-solving, and creativity in students. By presenting complex concepts in a visually intuitive manner, educators can scaffold learning experiences, enabling students to construct meaning and develop higher-order thinking skills. Moreover, visual communication serves as a universal language, transcending linguistic and cultural barriers, thereby fostering inclusivity and diversity in educational settings.

Conclusion. In conclusion, the transformative role of visual communication in education cannot be overstated. From its humble origins in traditional pedagogy to its pervasive presence in the digital age, visualization has become an indispensable tool for educators and

learners alike. As we navigate the complexities of an increasingly interconnected world, visual communication will continue to serve as a beacon of innovation and inclusivity in education. By embracing emerging trends, harnessing technological advancements, and fostering collaborative learning environments, educators can empower students to become active participants in their educational journey, equipped with the knowledge, skills, and competencies needed to thrive in the 21st century.

References

1. *Izhdeneva, I. V.* Role of associative mental maps for teaching pedagogical university students computer science / I. V. Izhdeneva // Vestnik KSPU named after V. P. Astafiev. — 2015. — No. 1. — P. 153—157.
2. *Makarova, E. A.* Visualization as a way of structuring knowledge and forming mental space / E. A. Makarova // International Journal of Cognitive Research in Science, Engineering and Education. — 2017. — No. 2. — P. 65—73.
3. *Makarova, E. A.* Approaches to visualizing big text data at the stage of collection and pre-processing / E. A. Makarova // Scientific Visualization. — 2019. — No. 4. — P. 13—26.
4. *Izotova, N. V.* Information visualization in context of modern education megatrends / N. V. Izotova // E3S Web of Conferences. — 2021. — Vol. 284, no. 09011. — P. 2—14.
5. *Toffler, A.* The third wave: The classic study of tomorrow / A. Toffler. — New York : Bantam, Random House Publishing Group, 2022. — 560 p.
6. *Bryson, C.* The role of engagement in inspiring teaching and learning / C. Bryson, L. Hand // Innovations in Education and Teaching International. — UK, 2007. — P. 349—362.
7. *Zhilina, A. I.* Regional education of XXI century: problems and perspectives / A. I. Zhilina // Vestnik KSPU named after V. P. Astafiev. — 2012. — Vol. 31, no. 4. — P. 184—192.
8. *Basyrova, A. E.* The experience of using infographics in the lessons of Russian as a foreign language / A. E. Basyrova // IV International Scientific and Methodological conference. — 2016. — Vol. 10, no. 2. — P. 41—48.
9. *Khomenko, O. V.* The development of students' readiness for research activities in vocational educational institutions is an important task of modern education / O. V. Khomenko // Educational technologies and society. — 2018. — Vol. 29, no 1. — P. 264—270.