THE EFFECT OF ANIMATED TEXT IN COGNITIVE PROCESSES: NEW FORMS OF PERCEPTION OF INFORMATION IN EDUCATION

Abstract. The relevance of the research topic is due to the rapid development of visual digital technologies, in particular in the field of text animation. Animated text has become a popular means of visualizing information on a variety of platforms, including websites, multimedia presentations, promotional materials, and other media. However, research on the impact of animated text on the cognitive processes of information perception is limited. This problem becomes especially relevant in the conditions of growing popularity of this type of content in the educational process of all levels of education. The purpose of this study is to determine the impact of animated text on the cognitive processes of information perception in education. The research methodology consists in the application of analysis and synthesis methods to generalize theoretical material from various scientific sources within the framework of the specified issues in combination with the practical experience of using animated texts in the educational process. The results of the study allow us to conclude that the inclusion of animated texts in educational materials significantly facilitates the process of providing and processing information, contributes to a better understanding of it by students. The practical
experience of using animation in the teaching of various disciplines shows the effectiveness of such practice in the interactive format of lectures, for visualizing experiments in laboratory classes, for activating student communication in seminar classes during discussions. However, the effectiveness of this practice depends on the complexity of the specific task, as well as the level of students' prior knowledge and their intellectual abilities. These factors, as the results of complex cognitive processes, and their impact on visual communication require further research. This will be facilitated by methods that are already being implemented in the educational process, as well as educational technologies that will be developed in the future within the framework of innovative pedagogy strategies.

**Keywords:** animated text, visual communication, cognitive processes, education, studying, long-term memory, visual stimulus.

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**ЕФЕКТ АНІМОВАНОГО ТЕКСТУ В КОГНІТИВНИХ ПРОЦЕСАХ: НОВІ ФОРМИ СПРИЙНЯТТЯ ІНФОРМАЦІЇ В ОСВІТІ**

Анотація. Актуальність теми дослідження зумовлена стрімким розвитком візуальних цифрових технологій, зокрема у сфері текстової анімації. Анімований текст став популярним засобом візуалізації інформації на різних платформах, включаючи веб-сайти, мультимедійні презентації, рекламні матеріали та інші медіа. Проте дослідження впливу анімаційного тексту на когнітивні процеси сприйняття інформації обмежені. Особливої актуальності ця проблема набуває в умовах зростання популярності такого типу контенту в навчальному
процесі всіх рівнів освіти. Тому метою даного дослідження є визначення впливу анімаційного тексту на когнітивні процеси сприйняття інформації в освіті. Методологія дослідження полягає у застосуванні методів аналізу та синтезу для узагальнення теоретичного матеріалу з різних наукових джерел в рамках означеної проблематики у поєднанні з практичним досвідом застосування анімованих текстів у навчальному процесі. Результати дослідження дозволяють дійти висновку, що включення анімованих текстів в навчальні матеріали значно полегшує процес надання та обробки інформації, сприяє кращому її розумінню учнями (здобувачами освіти). Практичний досвід застосування анімації при викладанні різних дисциплін показує ефективність такої практики в інтерактивному форматі лекцій, для візуалізації експериментів на лабораторних заняттях, для активізації комунікальності студентів на семінарських заняттях під час дискусій. Проте ефективність цієї практики залежить від складності конкретного завдання, а також рівня попередніх знань учнів та їх інтелектуальних здібностей. Ці фактори, як результати складних когнітивних процесів, та їх вплив на візуальну комунікацію потребують подальших досліджень. Цьому сприятиме методики, що вже впроваджуються у навчальній процес, а також освітні технології, які будуть розроблятися у перспективі в рамках стратегій інноваційної педагогіки.

Ключові слова: анімований текст, візуальна комунікація, когнітивні процеси, освіта, навчання, довготривала пам'ять, візуальний стимул.

Introduction. In recent years, visual technologies have developed significantly, particularly in the field of text animation. Animated text has become a popular means of visualizing information on various platforms, including websites, multimedia presentations, advertising materials, and other media. However, there is limited research on the impact of animated text on the cognitive processes of information perception. This problem becomes especially important in the context of the growing popularity of this type of content and its use in various fields, including education, marketing, design, and advertising [1; 2]. Therefore, the study of the impact of animated text on the cognitive processes of information perception is relevant and important for the development of visual communication strategies.

The purpose of the study is to determine the impact of animated text on the cognitive processes of information perception in education.

Materials and methods of research. The research methodology consists in the application of analysis and synthesis methods to generalize
theoretical material from various scientific sources within the framework of the specified issues in combination with the practical experience of using animated texts in the educational process (when teaching the disciplines "Computer networks", "Computer circuitry and computer architecture", "Operating systems", "Culture of business communication", "Philosophy of science and technology").

**Presentation of the main materials of the study.** The development of information technology and access to open-source multimedia content have significantly changed the way people perceive information. Thanks to this, multimedia materials have become widely used in various spheres of life, from education to entertainment. One of the areas that has a significant impact on society is the use of multimedia elements for education and information communication. Animated text is becoming an increasingly popular tool in this area. It can visually support textual information, making it more attractive and easier to understand. In this study, we look at the impact of animations on supporting learning processes. IT-based animations dynamically depict changes in events and are used in the classroom as external representations to enhance the content of knowledge transmitted in the classroom [3]. Research in related fields has investigated the impact of using these animations on student learning outcomes and reported conflicting results. We propose that the theory of cognitive relevance in information systems can reconcile these conflicting findings and provide some insights into how these animations can be used most beneficially.

Animation has been used in education for many years, and it can provide several benefits [4]. One of the most important benefits is that it can help engage students in the learning process. When students can see content that comes to life through animation, they are more interested in what they are learning and better able to retain the information. Engaging students in the learning process. Animation can be used to grab students' attention and make learning more interesting. With animation, teachers can bring abstract concepts to life and help students understand how they work together. This type of visual representation can be especially helpful for kinesthetic learners who need to see things to understand them. Helping students visualize complex concepts. One of the benefits of using animation in education is that it can help students visualize complex concepts that they might otherwise have trouble understanding.

Advantages of animation in education: improves skills and knowledge; promotes learner engagement; emphasizes learning; promotes interactive learning; experimental learning; fuels learner imagination; affordable and easily accessible [5].
Today we know that visuals have been shown to improve learning by up to 400% [6]. Our brains are designed to interpret the relationships between objects, which allows us to understand information with minimal effort. Therefore, it is difficult to ignore the fact that we know that visual information is a major factor in perceiving, understanding, and memorizing new information.

Animation allows you to turn abstract concepts and processes into something concrete and accessible. Visual stimuli can trigger an emotional response - which together builds memory. The more learning engages our long-term memory, the better our overall achievement. When animated written symbolic text and spoken narration are incorporated into learning materials, information is processed in parallel through both channels, which increases the overall processing power of the system and prevents possible overloads [7]. However, an animated text written in mathematical notation (symbols) strengthens the conceptual connection that must be established between the written text and its synchronized oral explanation, which contributes to both the identification of important information and the creation of a mental model of knowledge representation [8]. In addition, animation helps to synchronize visual and verbal information, which reduces the effect of temporality, while helping working memory (cognitive load) in the process of integrating key information to be understood [9].

Animated written text, together with synchronized narration, can also prevent the temporal information effect [10], which occurs when information initially presented is needed again to understand something later. It is important to remember that animation of written texts, unlike static text, provides the necessary information at any time, which, in addition to saving storage resources, can also serve as a signaling and segmentation function for multimedia materials.

Instructors can design multimedia presentations selectively, focusing exclusively on tasks that align well with cognitive processes. In general, based on the findings on cognitive alignment made in this study, educational technology providers (e.g., course developers) should evaluate individual learning topics and try to identify the presentation that best meets the cognitive needs of each topic. This way, we can take full advantage of the benefits of these sophisticated learning technologies. For example, integrating animation into the teaching of subjects such as math and molecular biology can improve learning outcomes. This is because animation, as an external representation, aligns well with the information presented, effectively illustrating complex math concepts and biological processes. Similarly, teaching topics related to historical events and
geographical phenomena, such as the Industrial Revolution or plate tectonics, also benefits from the use of animation. However, it is important to note that the degree to which learning is enhanced in any scenario depends on the quality of the animation design. Animations that move too fast or are disconnected from the underlying information cannot effectively clarify concepts or improve learning [11].

As employees increasingly embrace hybrid or remote work, integrating multimedia elements into digital learning is not just useful, but critical to providing comprehensive education and training for all employees. Incorporating video, audio, graphics, and animations helps lighten the burden of heavy textual content, making learning more engaging and memorable, especially when employees need to remember vital information. The inclusion of text animations ensures accessibility for a wide range of learners. For example, videos accompanied by subtitles or transcripts can help the hearing impaired or those who prefer to read aloud. The use of multimedia in learning materials saves instructional designers or course developers from having to develop numerous alternative learning options for different learner profiles. In addition, integrating animation into eLearning and digital learning solutions offers a cost-effective approach for companies looking to provide continuous training and development for their employees without the expense of conducting training sessions for each new cohort. Leveraging existing technologies and resources allows you to create multimedia content that can be reused and shared across teams.

The educational significance of kinetic typography can be seen through its correspondence to the characteristics of spoken and written language, which are the main means of learning. Traditionally, spoken language has been used for communication and understanding, while written language has been used for recording and representation. Both spoken and written forms have profoundly influenced human cognition and behavior, contributing to the formation of different cultural contexts. While kinetic typography shares similarities with written language as a textual form, it is distinct from static typography.

Although kinetic typography is not purely oral, it can be presented sequentially, similar to spoken language, facilitating simultaneous communication between sender and receiver. In addition, like spoken and written language, kinetic typography integrates various non-verbal elements that play a key role in increasing learner attention and engagement. These additional elements stimulate cognitive processes that aid in comprehension. In this regard, kinetic typography technology includes the functions of non-verbal elements, enriching the learning process [12].
A multimedia-rich environment not only offers participants a special learning experience, but also has a significant impact on their level of engagement. When various multimedia materials are integrated into learning activities, people demonstrate different forms of engagement, including behavioral, cognitive, and emotional engagement [13]. Behavioral engagement is related to a person’s level of focus and effort, emotional engagement is related to their affective mood, including interest and motivation, and cognitive engagement is related to their investment in learning, focus on learning strategies, and self-regulation. Active participation in the learning process and joint efforts contribute to improved learning outcomes [14]. Thus, promoting engagement throughout the learning journey is of paramount importance.

Conversely, people who are actively involved in the learning process tend to allocate more cognitive resources and process information more deeply, which affects their effective cognitive load [15]. Thus, the use of cognitive processes plays a key role in the formation of cognitive load.

**Conclusions.** In this paper, we examined the impact of animated text on cognitive processes of information perception. The study shows that the inclusion of animated text in learning materials does facilitate information processing and contributes to better understanding and learning.

The practical experience of using animation in the teaching of various disciplines shows the effectiveness of such practice in the interactive format of lectures, for visualizing experiments in laboratory classes, for activating student communication in seminar classes during discussions. However, the effectiveness of this practice depends on the complexity of the specific task, as well as the level of students’ prior knowledge and their intellectual abilities. These factors, as the results of complex cognitive processes, and their impact on visual communication require further research. This will be facilitated by methods that are already being implemented in the educational process, as well as educational technologies that will be developed in the future within the framework of innovative pedagogy strategies.

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