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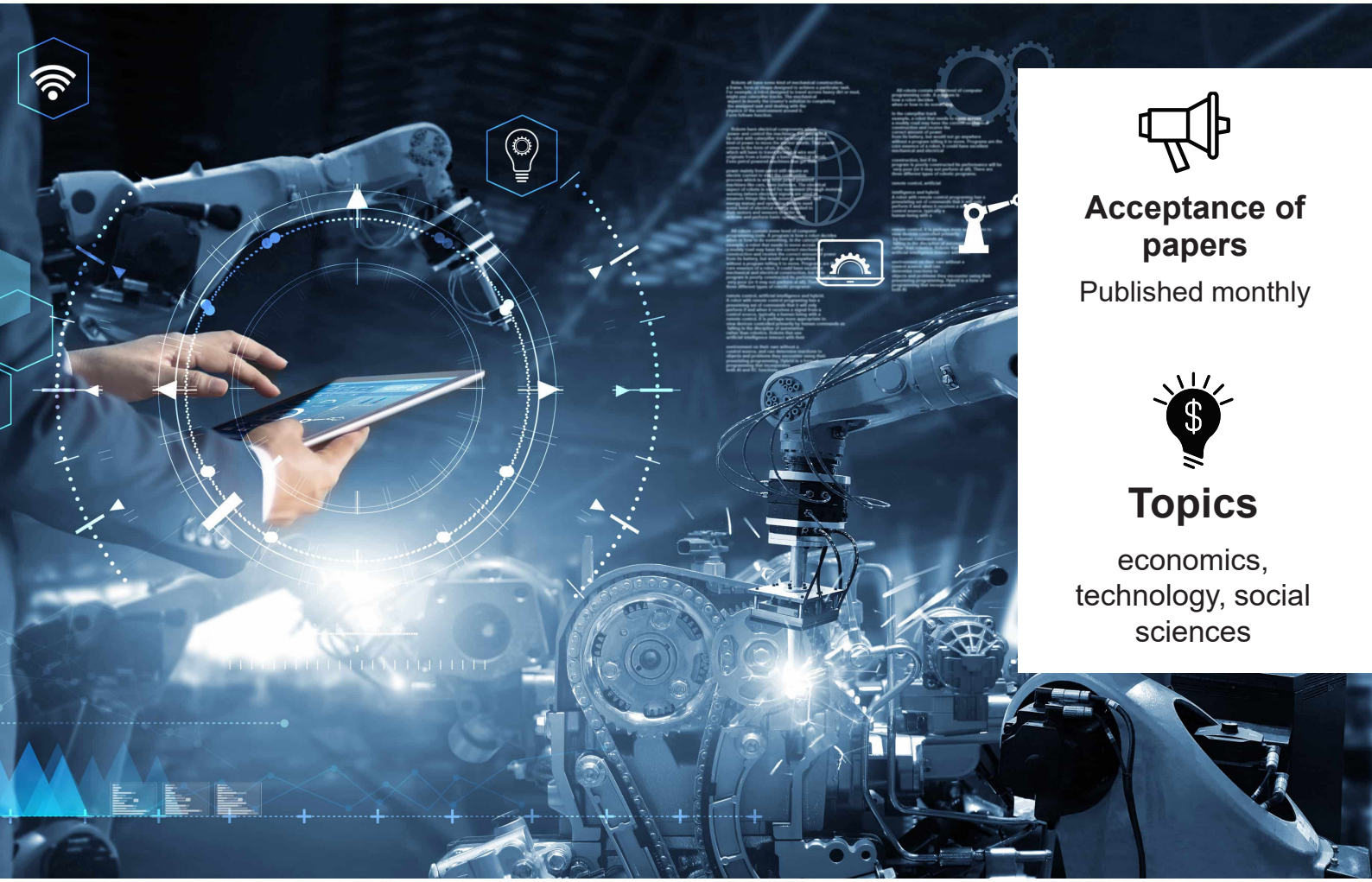

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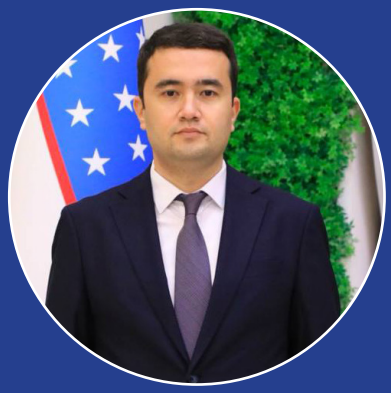

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CONTENTS

CONTENTS

COMPUTER GRAPHICS IN MODERN EDUCATION: PRACTICAL CAPABILITIES OF THE FIGMA PLATFORM

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Abstract: The article investigates how computer graphics function in modern educational systems while proving Figma's design platform functions as a novel educational tool for design training. The analysis shows that Figma functions as an efficient educational tool because its real-time collaboration features and accessible design and user-friendly interface solve most problems that academic institutions face with traditional design software. The findings suggest that integrating Figma into educational curricula can enhance student engagement, facilitate collaborative learning, and prepare learners for contemporary professional design environments.

Key words: computer graphics, Figma, design education, collaborative learning, digital literacy, educational technology, cloud-based platforms, visual communication, graphic design pedagogy, modern education.

INTRODUCTION

The educational system has undergone complete transformation because of fast digital advances which now affect all academic fields. The development of visual communication skills has become essential for students because of their growing importance in many professional fields. Educational institutions must provide students with digital design skills which meet industry standards and current technological progress because visual communication has become a vital requirement in various fields [1]. The adoption of cloud-based design platforms has changed graphic design and visual communication education by replacing traditional desktop software with modern learning environments that offer students accessible and collaborative experiences which match current work standards.

Figma stands out as an educational tool because it combines professional design features with teaching benefits which educators find valuable according to [2]. The theoretical foundation for examining Figma's educational potential draws upon constructivist learning theories and the principles of collaborative knowledge construction that have gained prominence in contemporary educational discourse [3]. Educational programs must include advanced design software which students from all academic fields need to learn because digital literacy has become an essential skill for employment during the twenty-first century according to current workforce demands [4].

REVIEW OF LITERATURE ON THE SUBJECT

The issue of integrating computer graphics into modern education has been widely examined within the broader context of digital transformation and the increasing role of information and communication technologies in teaching and learning processes. Contemporary research emphasizes that digital tools not only enhance the visualization of educational content but also contribute to the development of students' creative, analytical, and collaborative competencies. In this regard, the application of platforms such as Figma represents a logical continuation of the evolution of computer graphics as an educational discipline.

A significant contribution to understanding the role of ICT in education is provided by M. T. Rixsiyeva and D. A. Toshpulatova, who highlight that modern educational environments require the active integration of digital tools to improve the quality and accessibility of learning. Their work underscores the importance of interactive and practice-oriented approaches, which are directly supported by graphic design platforms. Similarly, B. R. Qodirov examines the prospects of digital education development in Uzbekistan, emphasizing that digital platforms serve as a key driver in enhancing students' professional competencies and aligning educational outcomes with labor market demands.

Methodological aspects of teaching computer science and graphics are extensively discussed in the works of M. P. Lapchik, I. G. Semakin, and E. K. Henner, who argue that modern teaching methods should incorporate practical tools that simulate real professional environments. E. S. Polat and colleagues further develop this idea by emphasizing the role of innovative pedagogical and information technologies in creating student-centered learning environments. L. I. Gorbunova and E. A. Subbotina also note that the integration of information technologies into the educational process enhances motivation, improves engagement, and facilitates the development of independent learning skills.

From a practical perspective, the emergence of collaborative design tools has transformed the teaching of computer graphics. The official Figma for Education resources demonstrate that browser-based design environments eliminate many traditional barriers associated with professional software, such as high costs and technical requirements, thereby democratizing access to design education. In addition, research by J. Tholander and M. Normark highlights that collaborative design tools reshape the role of the designer, promoting teamwork, shared responsibility, and iterative problem-solving processes—skills that are essential in modern professional practice.

Human-computer interaction principles also play a crucial role in understanding the effectiveness of platforms like Figma. B. Shneiderman and co-authors emphasize that user-friendly interfaces and intuitive design significantly influence user engagement and learning efficiency. These principles are directly reflected in Figma's interface, which supports ease of use, rapid prototyping, and seamless collaboration. Furthermore, the growing relevance of artificial intelligence in education, as discussed by R. Kh. Makhamadov, suggests that future developments in graphic design platforms will increasingly incorporate intelligent features, further enhancing their educational potential.

Overall, the synthesis of existing literature demonstrates that the integration of computer graphics into modern education, particularly through platforms such as Figma, is grounded in both strong theoretical foundations and practical pedagogical benefits. The convergence of collaborative technologies, cognitive science insights, and user-centered design principles creates a powerful framework for improving the effectiveness of design education and preparing students for the demands of the digital economy.

RESEARCH METHODOLOGY

The study implements a research methodology that combines systematic literature analysis with theoretical assessment of Figma platform features through pedagogical evaluation. The foundational literature on computer graphics in education establishes that visual literacy and digital design competencies have become essential components of contemporary education, extending far beyond traditional art and design disciplines [5]. Russian educational technology research has advanced knowledge about how digital design software affects teaching practices in post-Soviet educational environments [6]. Researchers have examined how the transition from traditional artistic education methods to digital design instruction requires not merely technological adoption but fundamental reconsideration of pedagogical approaches, assessment methods, and learning outcome definitions.

The theoretical frameworks which international research has established for collaborative design platforms demonstrate their ability to explain how cloud-based educational tools create new classroom dynamics [7]. The existence of real-time collaboration platforms creates new educational possibilities which require instructors to develop different teaching methods and assessment techniques [8]. The educational applications of Figma software display unique characteristics which make it distinct from conventional design programs used in educational settings according to specific research findings. Uzbek educational research has increasingly addressed the importance of integrating contemporary digital tools into national curricula to prepare students for participation in the global digital economy [9].

ANALYSIS AND RESULTS

The synthesis of analyzed literature shows that Figma functions as an educational tool for computer graphics instruction through its various practical applications. The platform demonstrates particular strength

in addressing longstanding challenges within design education, including accessibility barriers, collaboration limitations, and the gap between academic instruction and professional practice. The accessibility advantages of Figma emerge as perhaps the most significant finding from the literature analysis, with multiple sources confirming that the platform's browser-based operation and free educational tier substantially reduce barriers to design education participation [2]. Design software from professional design fields has always demanded designers to invest large amounts of money into both software licenses and necessary computer equipment which creates unfair access barriers that affect students from low-income families and schools that lack advanced technological resources. Through its elimination of these access barriers, Figma provides students with professional-grade design tools to use which creates a more equitable learning environment because all students now have equal access to the necessary resources.

The platform's collaborative functions serve as the second major discovery which produces essential educational effects according to research findings in [7]. Research studies show that real-time collaboration tools change social interactions among design students because they enable students to learn from each other and work together to solve problems while developing their creative skills which reflect actual design work environments. The collaborative aspect of this system supports constructivist learning theories which state that social interaction plays a crucial role in developing knowledge and skills. The capability of instructors to monitor student progress through real-time work observation together with their capacity to deliver instant feedback enables more customized teaching methods which traditional software solutions cannot provide.

The literature analysis demonstrates that Figma's design system components and shared libraries and style elements function as effective teaching tools for systematic design thinking and professional workflow instruction, according to [8]. The platform's design allows students to discover industry-standard design principles which include design consistency and reusable components and scalable design systems. The educational system gives students access to professional methodologies which helps them develop skills needed for their future work environments that require these systematic methods.

However, the literature analysis also identifies certain considerations and potential limitations that warrant attention [10]. Some scholars note that cloud-based platforms create dependency upon internet connectivity, which may present challenges in educational contexts with unreliable network infrastructure. Additionally, the rapid evolution of such platforms means that educational materials and instructor expertise require continuous updating to remain current with platform changes. These considerations do not diminish Figma's educational value but do indicate the importance of thoughtful implementation planning and institutional support for successful integration.

The synthesis of analyzed literature reveals several significant findings regarding the practical capabilities of Figma as an educational tool for computer graphics instruction. The platform demonstrates particular strength in addressing longstanding challenges within design education, including accessibility barriers, collaboration limitations, and the gap between academic instruction and professional practice. These findings have important implications for educators, curriculum developers, and educational administrators considering the integration of contemporary design platforms into their programs.

The accessibility advantages of Figma emerge as perhaps the most significant finding from the literature analysis, with multiple sources confirming that the platform's browser-based operation and free educational tier substantially reduce barriers to design education participation [2]. Traditional professional design software has historically required significant financial investment in both licensing fees and capable hardware, creating inequitable access conditions that disadvantage students from lower-income backgrounds or institutions with limited technological budgets. Figma's elimination of these barriers represents a meaningful advancement toward more equitable design education, enabling students to access professional-grade tools regardless of their personal computing resources or institutional funding levels. To systematically evaluate these comparative advantages, Table 1 presents an analytical comparison of Figma against traditional design software across key educational parameters (Table 1).

Table 1. Comparative Analysis of Figma and Traditional Design Software in Educational Contexts

Parameter	Traditional Design Software (Adobe Creative Suite)	Figma Platform	Educational Implication
Cost Structure	High licensing fees ($20-55/ month per user)	Free for educational use	Eliminates financial barriers; enables universal student access
Hardware Requirements	High-performance computer required; significant RAM and storage	Any device with modern browser	Reduces institutional infrastructure costs; supports BYOD policies

Installation Process	Complex installation; administrative privileges needed	No installation required	Immediate classroom deployment; reduced IT support burden
Collaboration Model	File-based sharing; version conflicts common	Real-time simultaneous editing	Enables peer learning; facilitates group projects
Instructor Monitoring	Limited to submitted files	Live observation of student work	Supports formative assessment; immediate intervention capability
Learning Curve	Steep; extensive training required	Moderate; intuitive interface	Faster skill acquisition; more time for design principles
Cross-Platform Access	Platform-dependent licenses	Universal browser access	Continuity between classroom and home learning
Update Management	Manual updates; compatibility issues	Automatic cloud updates	Consistent feature access; no version discrepancies

The data presented in Table 1 demonstrates that Figma offers substantial advantages across all examined parameters relevant to educational implementation. The elimination of cost barriers alone represents a transformative change in design education accessibility, while the collaboration and monitoring capabilities address pedagogical needs that traditional software cannot adequately fulfill. These findings align with the conclusions of multiple researchers who have emphasized the importance of accessibility and collaboration in contemporary educational technology adoption [3, 7].

The collaborative capabilities of the platform emerge as a second major finding with substantial pedagogical implications. The literature consistently indicates that real-time collaboration features transform the social dynamics of design education, enabling peer learning, collaborative problem-solving, and collective creative processes that more closely mirror professional design environments [7]. This collaborative dimension aligns with constructivist learning theories emphasizing the importance of social interaction in knowledge construction and skill development. Furthermore, the ability for instructors to observe student work in real-time and provide immediate feedback creates opportunities for more responsive and individualized instruction than traditional software environments typically permit.

Analysis of the literature also reveals that Figma's design system features, including components, styles, and shared libraries, provide valuable opportunities for teaching systematic design thinking and professional workflow practices [8]. Students working within the platform naturally encounter concepts such as design consistency, reusable components, and scalable design systems that represent current industry best practices. This exposure to professional methodologies within the educational context better prepares students for transition into professional environments where such systematic approaches are expected and required. To further elucidate the relationship between specific Figma features and their pedagogical applications, Table 2 presents a systematic analysis of platform capabilities mapped to educational outcomes (Table 2).

Table 2. Analysis of Figma Platform Features and Corresponding Pedagogical Applications

Figma Feature	Functional Description	Pedagogical Application	Developed Competency
Real-time Collaboration	Multiple users edit simultaneously with visible cursors	Group project facilitation; peer review sessions	Teamwork; collaborative design; professional communication
Version History	Complete record of all document changes with restoration capability	Error recovery; iterative design process demonstration	Design iteration; process documentation; risk-free experimentation
Commenting System	Contextual feedback attached to specific design elements	Structured critique sessions; asynchronous feedback	Critical analysis; constructive feedback reception and provision
Component System	Reusable design elements with instance-master relationships	Teaching design systems; consistency principles	Systematic thinking; scalable design practices
Auto Layout	Responsive design containers with automatic spacing	Responsive design principles; UI/UX fundamentals	Adaptive design; user experience consideration
Prototyping Mode	Interactive prototype creation with transitions and triggers	User testing concepts; interaction design	User-centered design; functional thinking

Design Tokens/ Styles	Centralized management of colors, typography, and effects	Brand consistency; design standardization	Professional workflow; style guide development
Community Resources	Access to templates, plugins, and shared files	Learning from professional examples; resource utilization	Research skills; professional community engagement
FigJam Integration	Collaborative whiteboarding and brainstorming tool	Ideation sessions; design thinking workshops	Creative ideation; visual thinking; concept development
Developer Handoff	Automatic CSS/code generation and asset export	Understanding design-development workflow	Cross-functional collaboration; technical communication

The comprehensive analysis presented in Table 2 illustrates that Figma's feature set extends substantially beyond basic design functionality to encompass a broad range of pedagogically valuable capabilities. Each feature corresponds to specific learning outcomes aligned with contemporary professional competency requirements, suggesting that systematic integration of these features into curricula can provide comprehensive preparation for professional design practice [4, 9]. The platform essentially functions as both a design tool and a learning environment, with features that inherently support educational processes rather than merely tolerating them.

However, the literature analysis also identifies certain considerations and potential limitations that warrant attention [10]. Some scholars note that cloud-based platforms create dependency upon internet connectivity, which may present challenges in educational contexts with unreliable network infrastructure, a consideration particularly relevant for institutions in regions with developing digital infrastructure. Additionally, the rapid evolution of such platforms means that educational materials and instructor expertise require continuous updating to remain current with platform changes. The proprietary nature of the platform also raises questions about long-term sustainability and the risks associated with dependency upon a single commercial provider for educational delivery. These considerations do not diminish Figma's educational value but do indicate the importance of thoughtful implementation planning, institutional support for successful integration, and contingency planning for potential platform changes or accessibility disruptions.

The findings further suggest that Figma's effectiveness as an educational tool depends significantly upon pedagogical approach rather than mere technological adoption [6]. The platform's capabilities create opportunities for innovative instruction, but realizing these opportunities requires educators to develop appropriate teaching strategies, assessment methods, and learning activities that leverage the platform's distinctive features. Simply transferring traditional design instruction to a new platform without pedagogical adaptation fails to capture the transformative potential that the technology offers. Educators must reconceptualize their instructional approaches to incorporate collaborative learning structures, formative assessment practices utilizing real-time observation, and project-based learning activities that exploit the platform's unique capabilities. This pedagogical transformation represents both an opportunity and a challenge, requiring investment in faculty development and institutional support structures to achieve successful implementation [5, 8].

CONCLUSIONS AND SUGGESTIONS

The comprehensive literature analysis conducted in this study demonstrates that the Figma platform represents a significant advancement in the technological resources available for computer graphics education, offering a combination of accessibility, collaborative functionality, and professional-grade capabilities that collectively address many longstanding challenges within design pedagogy. The synthesis of scholarly sources from Uzbek, Russian, and international contexts reveals consistent recognition of the platform's educational potential while also identifying important considerations for successful implementation. The findings establish a theoretical foundation for understanding how cloud-based collaborative design platforms can transform traditional approaches to teaching visual communication and graphic design, aligning educational practices more closely with contemporary professional environments and constructivist learning principles [1, 3].

The analysis reveals that Figma's most significant contribution to design education lies not in any single feature but rather in the convergence of multiple capabilities that collectively create an environment conducive to effective learning. The elimination of financial and technical barriers through browser-based operation and free educational access democratizes design education in ways previously unachievable with traditional professional software [2]. Simultaneously, the platform's real-time collaboration features transform the social dynamics of design instruction, enabling peer learning, collaborative creation, and immediate instructor feedback that align with established pedagogical best practices [7]. The systematic design features, including

components, styles, and design tokens, naturally introduce students to professional workflow methodologies, bridging the gap between academic instruction and industry expectations [8]. This convergence of accessibility, collaboration, and professional relevance positions Figma as a uniquely valuable tool for contemporary design education across diverse institutional contexts and learner populations.

The comparative and feature analyses presented in this study, systematized through tabular examination of platform capabilities against traditional alternatives and pedagogical applications, provide practical frameworks for educators and administrators evaluating technology adoption decisions[11]. The evidence suggests that institutions seeking to modernize their computer graphics curricula should seriously consider Figma integration, while remaining attentive to the implementation considerations identified in the literature, including internet dependency, platform evolution, and the necessity of pedagogical adaptation [6, 10]. Successful implementation requires more than mere technology adoption; it demands reconceptualization of instructional approaches, investment in faculty development, and institutional support structures that enable educators to fully leverage the platform's distinctive capabilities [4, 5].

The implications of this analysis extend beyond immediate practical application to broader questions concerning the future of design education in an increasingly digital and collaborative professional landscape. As visual communication competencies become essential across diverse disciplines and career paths, the accessibility of professional design tools becomes a matter of educational equity and workforce preparation [9]. Platforms such as Figma that reduce barriers while maintaining professional standards represent important developments in democratizing access to skills increasingly necessary for economic participation and professional success. Educational institutions at all levels should consider how such tools can be integrated not only into specialized design programs but across curricula where visual communication skills are relevant, which in the contemporary context encompasses virtually all fields of study and professional practice.

Future research directions suggested by this analysis include empirical investigation of learning outcomes in Figma-based instruction compared to traditional approaches, examination of optimal pedagogical strategies for leveraging platform capabilities, and longitudinal studies of student preparedness for professional practice following Figma-integrated education. Additionally, research attention should be directed toward understanding how such platforms can be effectively implemented in contexts with limited digital infrastructure, ensuring that the accessibility advantages identified in this analysis can be realized across diverse educational settings including those in developing regions. The continued evolution of cloud-based design platforms will require ongoing scholarly attention to ensure that educational practices remain aligned with technological developments and professional expectations, maintaining the relevance and effectiveness of design education in preparing students for successful participation in the contemporary visual economy.

LIST OF USED LITERATURE:

1. Rixsiyeva, M. T. Zamonaviy ta'limda axborot-kommunikatsiya texnologiyalarini qo'llashning dolzarb masalalari / M. T. Rixsiyeva, D. A. Toshpulatova // Pedagogik mahorat. – 2022. – № 4. – S. 156–162.
2. Figma for Education: Collaborative Design Tools for Teaching and Learning / Figma Inc. – San Francisco : Figma, 2023. – 45 p. – URL: https://www.figma.com/education/ (data obrashcheniya: 15.03.2024).
3. Выготский, Л. С. Педагогическая психология / Л. С. Выготский. – Москва : Педагогика-Пресс, 1996. – 536 с.
4. Лапчик, М. П. Методика преподавания информатики : учебное пособие / М. П. Лапчик, И. Г. Семакин, Е. К. Хеннер. – 3-е изд. – Москва : Академия, 2006. – 624 с.
5. Горбунова, Л. И. Использование информационных технологий в процессе обучения / Л. И. Горбунова, Е. А. Субботина // Молодой ученый. – 2013. – № 4 (51). – С. 544–547.
6. Полат, Е. С. Новые педагогические и информационные технологии в системе образования / Е. С. Полат, М. Ю. Бухаркина, М. В. Моисеева. – Москва : Академия, 2009. – 272 с.
7. Kozhevnikov, M. Cognitive Styles in the Context of Modern Psychology: Toward an Integrated Framework of Cognitive Style / M. Kozhevnikov // Psychological Bulletin. – 2007. – Vol. 133, № 3. – P. 464–481.
8. Tholander, J. The Designer's Stance: Explorations into the Role of the Designer in Collaborative Design Tools / J. Tholander, M. Normark // Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems. – New York : ACM, 2020. – P. 1–14.
9. Qodirov, B. R. O'zbekistonda raqamli ta'limni rivojlantirish istiqbollari / B. R. Qodirov // Xalq ta'limi. – 2021. – № 6. – S. 23–29.
10. Shneiderman, B. Designing the User Interface: Strategies for Effective Human-Computer Interaction / B. Shneiderman, C. Plaisant, M. Cohen, S. Jacobs. – 6th ed. – Boston : Pearson, 2016. – 624 p.
11. Махамадов, Р. Х. (2022). Перспективы применения технологий искусственного интеллекта в образовании. ТЕСНика, (1 (9)), 1-10.

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