

DIGITAL TRANSFORMATION IN EDUCATIONAL SYSTEM: PROBLEMS AND SOLUTIONS

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ABSTRACT. This article provides information on the implementation of educational transformation in today's globalization process, providing various solutions to current problems in the approach of the educational system, and the role of digital technologies in it.

KEY WORDS. Digital economy, digital educational technologies, digital transformation, Industry 4.0, educational system, cloud computing, Internet of things, artificial intelligence, big data, STEAM.

ЦИФРОВАЯ ТРАНСФОРМАЦИЯ В СИСТЕМЕ ОБРАЗОВАНИЯ: ПРОБЛЕМЫ И РЕШЕНИЯ

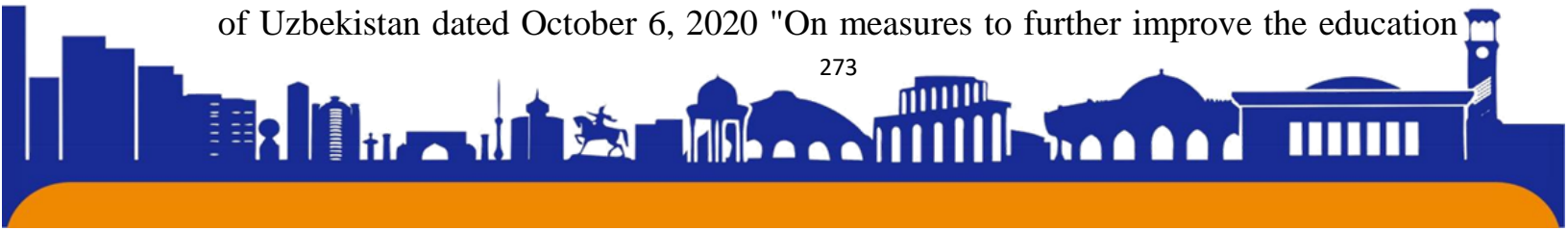
АБСТРАКТНЫЙ. В данной статье представлена информация о реализации образовательной трансформации в современном процессе глобализации, предложены различные варианты решения актуальных проблем в подходе образовательной системы и роли цифровых технологий в ней.

КЛЮЧЕВЫЕ СЛОВА. Цифровая экономика, цифровые образовательные технологии, цифровая трансформация, Индустрия 4.0, образовательная система, облачные вычисления, Интернет вещей, искусственный интеллект, большие данные, STEAM.

1.INTRODUCTION

Today, the urgency of transforming the economy is related to the changes aimed at eliminating the conflicts between the socio-economic development and the rapid features of the transformation processes.

A lot of work is being done in Uzbekistan regarding the development of digital technologies. In particular, on the basis of the decision of the President of the Republic of Uzbekistan dated October 6, 2020 "On measures to further improve the education





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system in the field of information technology, develop scientific research and integrate it with the IT industry" - No. 4851 These include the adoption of the "Digital Uzbekistan - 2030" strategy and the focus on digitization in the New Uzbekistan Development Strategy for 2022-2026. From this point of view, the Government of Uzbekistan plans to expand IT and Business Process Outsourcing (BPO) and Knowledge Process Outsourcing (KPO) services to strengthen digital skills and create digital jobs in Uzbekistan, including youth empowerment. is doing its consistent work.[1]

It is no secret that in the reality of the 21st century, up-to-date, reliable information, including the ability to search, analyze and correctly transcribe it, and knowledge are the main resources. Currently, the world has entered the fourth industrial revolution - Industry 4.0, which sets special conditions for the implementation of most types of activities. First of all, the industry and the economic sector as a whole are subject to changes, but these areas cannot be changed without training qualified personnel. Competent perception and processing of the received information allows to organize the educational process more effectively. [2]

Digital transformation refers to the use of technology to transform analog processes into digital ones. The transition to digital technologies has affected all areas of our lives that use artificial intelligence - from smart watches to home assistants. Digital transformation has changed due to new technologies such as machine learning, big data and the Internet of Things.

Digital transformation is not just an education reform. It is a multi-year program of activity affecting all levels of education. As in the case of services and material production, the work on the digital transformation of education should be result-oriented at all stages of program implementation and help to improve the quality of work of educational institutions. need Digital technologies help to fundamentally improve the quality of education of students, to form all the necessary skills in them, to form the ability to actively (consciously and creatively) use all available digital tools, materials and services. The basis of the digital transformation of educational institutions is the introduction of digital technologies and the transition to a personalized organization of the educational process, where their use is the most effective. Changing the work of educational organizations requires changing the legal framework for digital transformation of education. Without doing this in practice, this framework cannot be implemented without extensive field testing and refinement on innovative digital





learning platforms during extensive legal experimentation. Here, developers of digital learning resources get help in preparing initial requirements and specifications. They test and improve their materials to make them as easy to use and effective as possible.

2 LITERATURE REVIEW

According to the point of view of Voronin D, the transition to the digital economy has significantly changed the requirements for the implementation of educational activities, which has led to the need to personalize the educational process. The need to obtain competencies, skills and basic skills of the XXI century is becoming a necessity not only for students, but also for the teaching staff who implement educational programs. For teachers, it becomes necessary to form new competencies that will ensure high-quality activities in the new, digital educational environment. The ability to create and process video and audio content, as well as modern software, are significant tools in modern didactics. [14]

The article discusses the relevance of digital transformation in the learning process in higher educational institutions. The authors of the article have identified the problem of digital transformation of higher education and established contradictions between the continuous increase in the requirement for the availability of various forms of education (blended, hybrid, distance learning) and the quality of professional training of students. The authors have identified the main problems associated with transformation in the field of modern education: the phenomenon of "clip thinking", the crisis of text culture. The purpose of the research is to identify the pros and cons of digital education at a university by analyzing the use of digital technologies in the design of new educational material. [15]

A. U. Ogoev mentioned in his article that the modern education system, closely interacting with all areas and sectors of the economy, dynamically responds to any changes and takes us to a new stage of development - the stage of universal digitalization. The change in Federal State Educational Standards, a new concept for the development and implementation of educational programs, taking into account the requirements of professional standards and the requests of employers, determine the need for training specialists with complex competencies. These problems can be solved with the help of the digital transformation of higher education. This article is devoted to the digital transformation of higher education. It considers the concepts of "informatization", "digitalization", "digital transformation of education". [16]In the



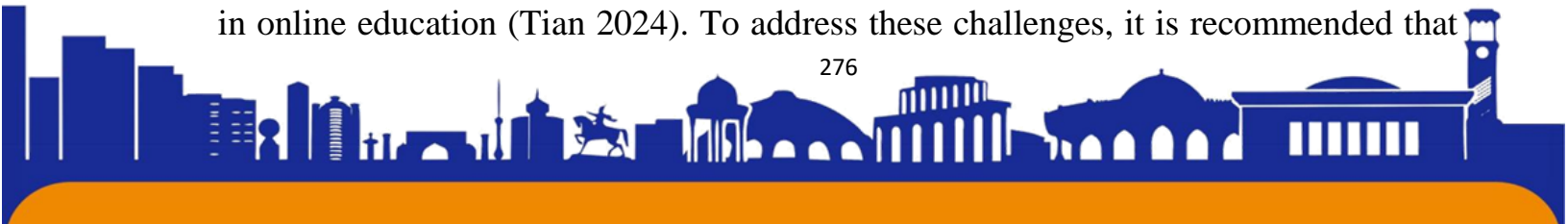


opinion of the Xinling Tian, This study has examined the current state of digitalization in education, i.e., online learning and distance education platforms are now widely used and there is a wealth of digital teaching materials and resources, but at this stage of the digital transformation there are still two major problems, i.e., teachers need to improve the use of digital technology and online courses cause problems in the communication between teachers and students. These problems are due to the lack of teachers' training in digital technology, the uneven distribution of teaching resources, and the fact that online courses are not face-to-face. [17]

George Bucăța, Digital transformation is a crucial component of many industries, including education. It can help institutions to improve efficiency, reduce costs, enhance student engagement and outcomes, and increase access to education for students from all backgrounds. Higher education institutions must be willing to adapt to these changes to remain competitive and to provide their students with the skills and knowledge they need to succeed in the digital age. [18]

By reevaluating the digital tools utilized in the classroom, digital transformation has a significant effect. Digital tools to build a campus with limitless learning opportunities have sparked new levels of invention and collaboration. Schools are making remarkable progress and have started to see the value of digital transformation in education, but there is still much to do. The biggest beneficiaries of these modifications are students who may now take advantage of new collaboration and learning opportunities. Schools gain from improved efficiency and a better ability to satisfy the requirements of their pupils at the same time. Both students and teachers can improve their ability to design an interesting educational process through digitization of the learning process. [19]

The digital transformation of education, especially in higher education, is a multifaceted process that necessitates the development of digital literacy and competencies among faculty members (D.M 2020). This transition is accompanied by challenges, such as the prevalence of "clip thinking" and the decline of text-based culture (Evenko 2024). To tackle these issues, it is essential to update the educational process to meet new standards and norms, and to improve the ICT skills of university educators (Ogoev 2023). In primary education, digital transformation encounters difficulties like teachers' inadequate digital technology skills and communication issues in online education (Tian 2024). To address these challenges, it is recommended that



teacher teams undergo digital technology training and that AR and VR technologies be implemented to create realistic classroom environments.

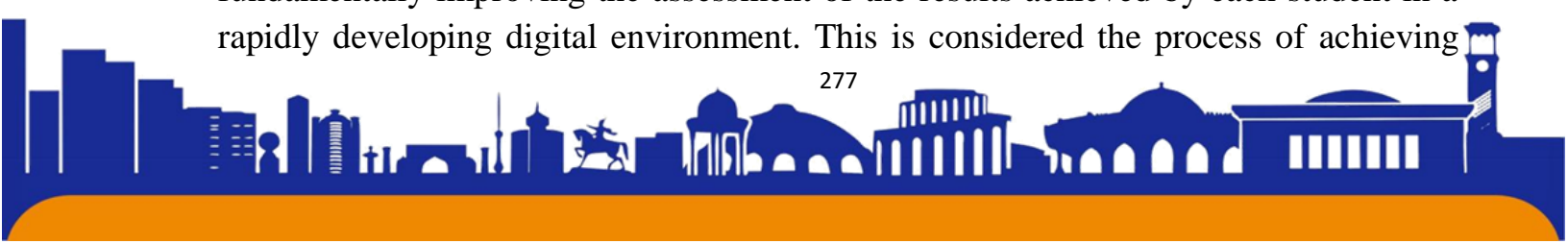
3 RESEARCH METHODOLOGY

To investigate the digital transformation in the educational system, this study employed a comprehensive methodology encompassing a thorough literature review and a mixed-methods approach to data collection. The literature review involved analyzing academic journals, books, conference proceedings, and credible online sources to establish a theoretical framework and understand current trends in digital transformation in education. Data collection was carried out through online surveys distributed to educators, students, administrators, and IT professionals to capture a broad range of experiences and perceptions. Additionally, semi-structured interviews with selected participants provided deeper insights into the challenges and solutions associated with integrating digital tools in educational settings.

4 RESULTS OF RESEARCH

The use of digital technologies in education is relevant compared to other areas. Digital technology is used not only in higher education, but in all stages of education, from kindergarten to university level. In many countries around the world today, more money leads to better results. For example, Vietnam spends the same amount per student as Tunisia on education as a percentage of GDP per capita. However, in Tunisia, only 64% of students completed international secondary education, compared to 96% in Vietnam. According to the Commission's analysis, improvements in the design and delivery of education will succeed only if they are underpinned by a system built to deliver results. Strong outcomes-based education systems – education systems that ensure policy coherence, a clear path from policy to implementation, and effective governance and accountability are essential for strong outcomes and lasting change. [3]

Throughout history, education has been a source of personal dignity and opportunity, and has been considered a driving force for social, economic, political, and cultural development in all areas. If we want it to have such power again in 2030, it is necessary to implement the digital transformation of education [4]. Digital transformation of education is a process of updating educational plans and results, educational content, educational methods and organizational forms, as well as fundamentally improving the assessment of the results achieved by each student in a rapidly developing digital environment. This is considered the process of achieving





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"Digital Maturity", as a result of which a digital educational environment consisting of a set of information systems summarizing all participants of the educational process is formed.

By introducing digital technologies into the education system to ensure that public education is in line with global trends and needs, it enables the modern labor market. The purpose of the research is to justify the promising directions of digital use, the technologies in education and the concepts of teaching in accordance with the present time are the world trends in the development of education. According to the objective, the objectives of the research are as follows:

- proving the leading role of education in solving the strategic task of creating digital technologies;
- defining the main directions of development of digital technologies in education and describing their content;
- technologies that reveal the essence and advantages of innovative educational concepts based on digital education;
- summarizing the prospects for the development of education, digitalization of the economy.

Digital technologies are technologies that provide information in a "digitized", universal digital form. Digital technologies are electronic tools, systems, devices and resources that enable the creation, processing, storage and transmission of information. Digital technologies in education is the creation of an educational environment based on digital technologies. Today, the following digital technologies can be used in the educational process:[5]

- Cloud computing: Students and teachers can create and edit documents, store and share files, collaborate on the same documents in different environments without having to install programs directly on the machines, and on the other hand o provides services that allow you to make contributions.

- Artificial Intelligence - AI tools can transform the learning experience for many students. An audio-to-text application allows you to easily create lecture notes. Text-to-speech technology can help students with dyslexia or other reading disabilities. Frequently asked questions outside of class, chatbots can take on the role of student advisors and answer common student questions. For example, a few years ago, Deakin





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University in Australia used AI to create a 24/7/365 counseling service for students – the service answered 30,000+ questions in the first trimester alone.

- Internet of Things - The ubiquity of smartphones and other similar devices connects the student body, enabling real-time communication and data transfer. Then, as students return to physical school and university buildings, IoT can be used to optimize the physical environment.

- 5G networks: Allows students to accept the concept of digital education and learn in different formats without space and time limitations. It provides new learning methods (live and virtual reality) to encourage the learner to integrate learning into everyday life.

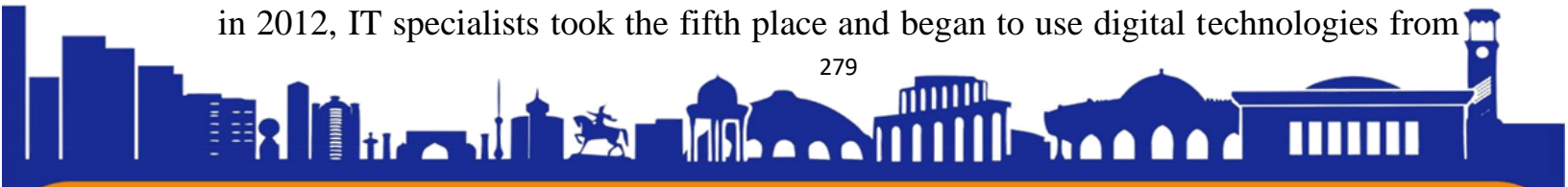
- E-learning is a method of organizing education through digital technologies, which can be done online or offline through a computer or other digital device. It can be accessed from most electronic devices such as computers, laptops, tablets or smartphones, providing a versatile and easy way for students to learn wherever they are.

- Learning Management System (LMS) is a human-machine complex designed to manage educational activities consisting of video lessons, lecture materials, presentations, books, etc. a form of education.

- Massive Open Online Course (MOOC) is a platform that allows students to study throughout the year or in short sessions. Through MOOC platforms, the world's most prestigious educational institutions, such as Harvard and Massachusetts, offer online courses of various levels and levels. It also provides the opportunity to register thousands of students at the same time, study as a member of the course during the year or at any time.

- Big data (Big Data) is a large collection of data that grows over time and includes technical and software tools aimed at performing actions on the data. Unlike traditional databases, big data offers the ability to collect, process and transmit large amounts of data. It helps to obtain the necessary information through effective data analysis.

ICT employment in OECD countries as assessed by educational institutions. This employment makes up 20% of the total figure and puts Turkey - 11%, Portugal and Greece - 15%, Great Britain - 28%, Luxembourg - 35% in the leading position. Also, in 2012, IT specialists took the fifth place and began to use digital technologies from



the early stages of education, from preschool age. Undoubtedly, in the near future, about 90% of occupations will require digital literacy. As estimated by D. Frezzo (2017) at the World Economic Forum (May 2017), 65% of children entering primary school in the future will find themselves in occupations that do not currently exist.[6]

Digital technology transformation is one of the current trends in the industry. There is a huge opportunity for digital transformation in the Indian education system, especially in schools, universities and colleges. Although, digitization and digital approaches are ways to open access to teaching or learning modules by digitizing lecture content and making it available online. This includes not only new technology, but also modern ways of working. The rarest resource in the world of education is actually not a technological approach, but also with management control. Today's leaders, potential students, must be able to judge through the mass of digital initiatives, manage the acceleration of innovation cycles, and reform the organization around new directions.

5 DISCUSSION

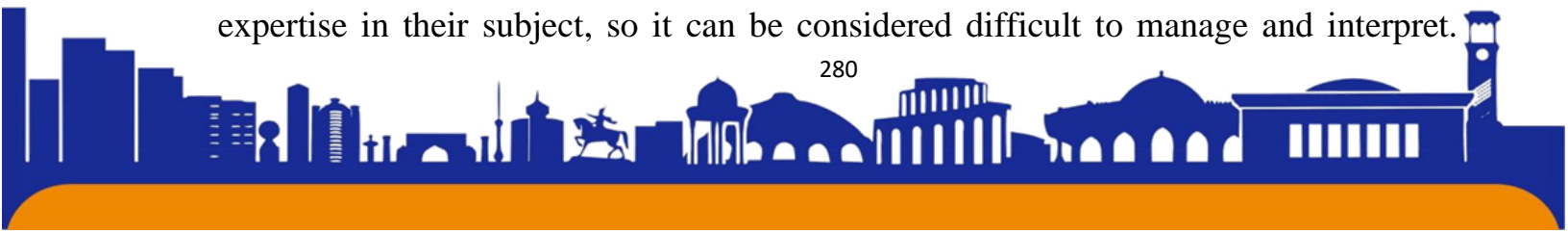
Why is digital transformation important in higher education?

In order to consider digital transformation in higher education, it is important to recognize the impact of the pandemic. The use of technology generates large amounts of data that reflect user interactions. This data is an invaluable source of insight that informs the education system about how students are learning, what they are working on, and what needs to happen next. Learning data used in this way is often called learning analytics.

How will technology affect the future of education?

Digital transformation helps young people become more modern, active and effective organizations and increase their value. We are already seeing emerging technologies being used in educational applications such as virtual and video-assisted learning, VR and AR robotics, chatbots, the Internet of Things, data security, and blockchain for certification. Adoption of new technology will continue to impact access, consumption and experience in education. Making it easy for anyone to learn from anywhere is critical to creating an advantage in this increasingly competitive global landscape.

A common challenge in the education system is that students do not have enough expertise in their subject, so it can be considered difficult to manage and interpret.





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When data is exposed, it is not always clear how an institution can make the most of the available data.

SOLUTION. We've created a student engagement analytics system called SREAM that allows institutions to easily aggregate existing data from various digital systems and uses a calculated way to present student engagement data to both students and staff. It provides an institution-specific objective measure of each student's participation, such as:

1. Daily score for movement support (with simple classification);
2. History involvement and interventions to track actions;
3. Communication and messages to demonstrate success together;
4. Intuitive dashboards to deliver a universal tool for collaboration.

STEAM not only provides efficiencies in the way information is processed and acted upon, but also supports future decision-making across the institution and supports the future adoption of modern technologies and their effectiveness in the future to deliver a richer student experience. and establish institutional superiority.[7]

The main goals of digital transformation in higher education

Leaders of higher education institutions always cite the following four main goals. They hope to improve the learning environment for students, increase the operational efficiency of their program, increase computing power for cutting-edge research, and encourage innovation in education. Management turns to digital transformation (DX) to turn these visions into reality.

How digital transformation can achieve these goals:

1. Improving the student's learning environment.

Technology enhances the learning environment with enhancements such as TEDX lessons: apps for perfect learning and VR-AI tools that help them share their thoughts and ideas and better understand the topics.

Overall, technology helps students acquire the critical thinking, social, and technical skills needed for high-paying jobs in the 21st century. Technology also gives teachers access to evidence-based tools (such as quizzes and modules), helping them measure their students' performance and tailor content accordingly, among other benefits. There are three types of digital learning:

- Face-to-face classes in which one or more mentors interact with one or more students in a virtual environment.





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□ Blended courses, also called hybrid, where both synchronous and asynchronous training are mixed. A recent model of classrooms where teachers combine asynchronous learning with video chats, assigned readings, shared documents, uploaded media, online quizzes, and discussion boards for flexible viewing. 'changed'.

□ Distance, online courses separated from any traditional classroom experience.

2. Increasing the operational efficiency of the institution.

Since the early 2000s, higher education institutions across the country have turned to analytics to manage surging enrollment and recruiting costs. To compete, higher education institutions use descriptive analytics to describe situations, predictive analytics to predict events, and diagnostic analytics to identify (and then analyze) possible solutions to their problems.

Data analytics are used in campus-wide marketing, recruitment decisions, financial aid, student advising, academic planning, financial forecasting, and even executive planning.

3. Increasing computing power for cross-sectional studies.

Digital libraries of databases contain full articles and abstracts of billions of literature, including monographs, reports, conference proceedings, and dissertations. Popular search engines like Google and YouTube help students and teachers access endless research.

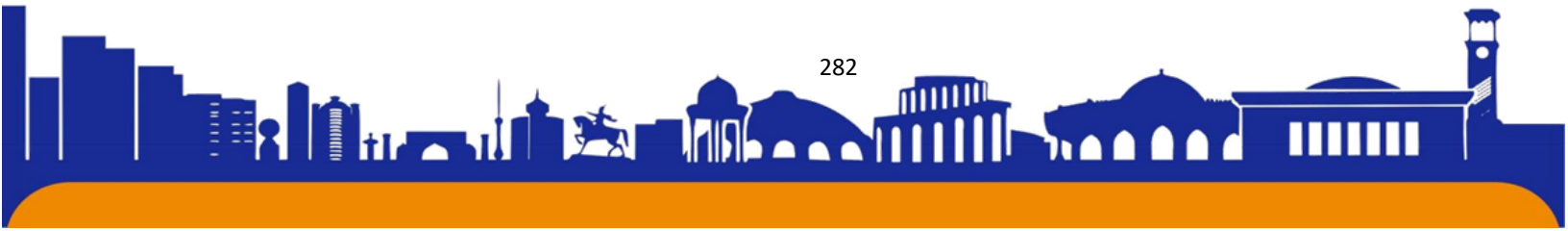
Schools have set up their own IT desks to help students search for information on exams, curricula, etc. In short, digital technologies provide a cost-effective seamless path to quality education, with up-to-date and consistent information across subjects.

4. Stimulation of innovations in the field of education.

Technology not only frees up time for teachers to innovate, but also gives them the tools to do so. Example: Out of 200 PhD graduates, only seven manage to land permanent positions in academia or research after graduation. In 2019, Beatrice Zatorska and Chris Jack founded a machine learning program to help these academics find their dream jobs.

Companies on board search for solutions to their business problems through digital research "cards" produced by research staff, then approach these graduates for job interviews.

5. Cut costs.





Higher education through methods that include pushing campus technology systems to the cloud, replacing quality instructors with e-learning, phasing out textbooks with digital content, and replacing expensive hardware with VR or AR resources. reduces costs. Teacher apps free educators to work more meaningfully, while other solutions save time by allowing educators to customize and accelerate their teaching.

Technology is a special boon for under-resourced schools, giving them affordable access to quality content. They can train themselves and their staff through professional learning teams, use other expensive technologies to accelerate their lessons, among other benefits.[8]

6.CONCLUSION

We're seeing the impact of AI, machine learning, and analytics as part of massive digital transformation efforts in education. According to a recent estimate, global GDP could increase by more than \$11.5 trillion by 2028 if countries could better prepare students for the needs of the future economy. From a social point of view, in particular, about 300,000 Uzbek students were affected in one way or another because they could not physically go to educational institutions due to the Covid-19 pandemic. [9] Digital technologies allow us to find completely new answers to the questions of what people learn, how they learn, where and when they learn.

In the context of this work, enablers correspond to drivers and factors that support and serve digital transformation initiatives. Individual implementation of this factor can bring both benefits and challenges, but their combination will contribute to the true digital transformation of education.

REFERENCES

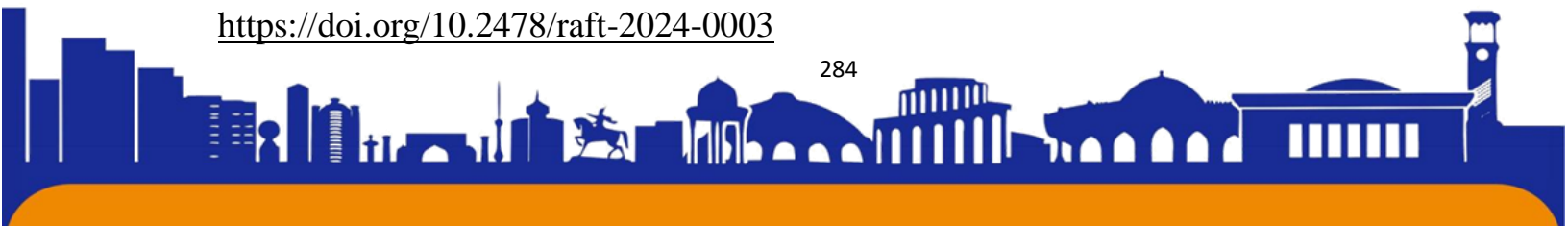
1. Axborot texnologiyalari sohasida ta'lim tizimini yanada takomillashtirish, ilmiy tadqiqotlarni rivojlantirish va ularni IT-industriya bilan integratsiya qilish chora-tadbirlari to'g'risida <https://lex.uz/uz/docs/-5032128?ONDATE=12.05.2022>
2. Ijodkor o'qituvchi ilmiy-uslubiy jurnal 5-oktyabr, 2022-yil 22-son
3. Ta'lim transformatsiyasida raqamli texnologiyalarning ahamiyati International scientific journal volume 1 ISSUE 8 UIF-2022: 8.2 | ISSN: 2181-3337
4. Ta'lim transformatsiyasida raqamli texnologiyalarning ahamiyati International scientific journal volume 1 ISSUE 8 UIF-2022: 8.2 | ISSN: 2181-3337





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5. Digital Transformation in Higher Education: Trends, Tips, Examples & More Written by: Eric Spear | CEO <https://precisioncampus.com/blog/digital-transformation-higher-education>
6. Ta'limda raqamli iqtisodiyot: istiqbol va rivojlanish istiqbollari 2022 yil 30 noyabr | scientists.uz
7. Digital Transformation in Higher Education: The Role of Leaders in a Digital Initiative (31 May, 2022Diana Baker Freeman) 31 May, 2022Diana Baker Freeman
8. Digital Transformation in Education: A Mixed Methods Study of Teachers and Systems School of Education Murdoch University June, 2020
9. Ta'lim 4.0 - raqamli transformatsiya omillari ISSN 2116-2016
10. T.S.Axromeva, G.G.Malinetskiy, S.A. Posashkov. Raqamli haqiqatning ma'nolari va qadriyatlari: kelajak. Sinergetika // Falsafiy fanlar. 2017 yil. 6-son.
11. Journal of emerging technologies and innovative research (JETIR) (ISSN-2349-5162) © 2021 JETIR September 2021, Volume 8, Issue 9
12. Higher Education Future in the Era of Digital Transformation Sci. 2022, 12(11), 784; <https://doi.org/10.3390/educsci12110784>
13. The Rise of Digital Transformation in Universities (Rachel Maltese Updated April 6 2021)
14. Voronin D.M, Saienko V.G, Tolchieva H.V, Luhansk Taras Shevchenko, Digital Transformation of Pedagogical Education at the University, <https://doi.org/10.2991/assehr.k.200509.135>
15. E. V. Evenko, O. Glivenkova, Digital transformation of education and modern educational technologies, <https://doi.org/10.47370/2078-1024-2023-15-4-83-92>
16. A. U. Ogoev, S. R. Khablieva, Digital Transformation of Education: Prospects and New Opportunities, <https://doi.org/10.29025/1994-7720-2023-1-117-123>
17. Xinling Tian, Digital Transformation of Basic Education: Current Situation, Dilemmas and Countermeasures, <https://doi.org/10.62051/82gy0770>
18. George Bucăța, C. Tileaga, Digital Renaissance in Education: Unveiling the Transformative Potential of Digitization in Educational Institutions, <https://doi.org/10.2478/raft-2024-0003>



ISSN (E): 2181-4570 ResearchBib Impact Factor: 6,4 / 2023 SJIF 2024 = 5.073/Volume-2, Issue-6

19. Trong Tai Bui, Truong Son Nguyen, The Survey of Digital Transformation in Education: A Systematic Review, <https://doi.org/10.54855/ijte.23343>