Implementation of digital transformation of higher education institutions

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Abstract:
This article delves into the exploration of digital transformation and digital technologies within the realm of higher education. It evaluates the impact of digital transformation on higher education, highlighting both its advantages and disadvantages, while also addressing the challenges that impede the successful implementation of distance learning through digital technologies and offering solutions to overcome them. Furthermore, the article underscores how digital technological solutions function as dependable aids to university management by enhancing communication between educators and students, facilitating oversight of the educational process, and enabling informed decision-making. The discourse emphasizes that leveraging digital and advanced pedagogical technologies underscores the significance of amalgamating face-to-face interactions between faculty and students with the effective integration of cutting-edge digital tools in educational practices and university administration.

Keywords: digital transformation, digital transformation trends, digital technologies, digital teaching and learning system, distance platforms, Internet network.

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INTRODUCTION

The integration of digital transformation is increasingly pivotal within contemporary educational frameworks. Higher education establishments are incorporating digital solutions to optimize the learning environment and enhance student engagement. The utilization of digital technology in higher education yields numerous benefits, such as heightened flexibility, enhanced data accessibility, and improved collaborative opportunities. The integration of digital transformation in higher education institutions holds the promise of fundamentally reshaping the entire educational landscape. Technological applications enable institutions to craft tailored and engaging learning experiences for students [10]. For instance, adaptive learning platforms can monitor student progress, dynamically adjust content difficulty levels, and deliver personalized educational interactions.

Simultaneously, the adoption of digital tools can bolster collaboration between students and educators, facilitate remote learning, and ensure the utilization of diverse educational resources. This not only elevates the educational standard but also broadens access to education for individuals unable to partake in traditional institutional settings due to geographical or financial constraints[11].

While the advantages of digital transformation in higher education are evident, institutions face significant challenges that require resolution. Among these challenges, one of paramount importance is the financial implications associated with implementing digital transformation. Institutions are required to make substantial investments in technology, infrastructure, and training of personnel, posing a considerable economic burden.

Moreover, institutions must confront issues concerning data privacy and security, accessibility, and inclusivity. The deployment of digital tools has the potential to exacerbate a digital divide, wherein marginalized students may not have equal access to resources compared to their more privileged counterparts.

Another obstacle involves the necessity for institutions to keep pace with the rapid advancements in technology. Institutions must continually invest in technological upgrades, modernize their infrastructure, and deliver optimal learning experiences for students[27].

Research methodology. The research methodology for digital transformation in higher education encompasses the incorporation of technological tools across various facets of the academic setting. Key methodologies involved in this transformation include the utilization of online educational management systems, digitalized textbooks, and collaborative platforms. These tools facilitate the development of a more adaptable and customized learning environment. Furthermore, digital solutions enhance access to educational materials, empowering students to engage in self-paced learning within their preferred settings.

Analysis and findings. The integration of digital transformation within the realm of higher education has produced a multitude of favorable outcomes. A primary advantage lies in the augmentation of student engagement. Through the integration of digital tools within the educational framework, students exhibit heightened levels of participation and motivation, consequently yielding improved academic outcomes. Moreover, digital solutions empower educators to monitor student advancement and pinpoint areas necessitating additional assistance.

The adoption of digital technology in higher education has further resulted in an enhanced accessibility to learning. Individuals previously impeded by educational obstacles, such as individuals with disabilities or those residing in remote locales, now possess the ability to access educational materials and partake in courses from any location with internet connectivity. Additionally, digital solutions have engendered financial savings for both students and educational institutions, as the utilization of digital textbooks and online courses obviates the requirement for costly physical textbooks and supplementary materials [13].

The SWOT analysis method demonstrates its utility as a foundational tool for evaluating the strengths, weaknesses, capacities, and risks associated with the integration of digital transformation within higher education establishments. Through this assessment, the merits, drawbacks, prospects, and challenges inherent in executing digital transformation were scrutinized, leading to the subsequent findings:

Strengths:

- Enhanced educational experiences: Leveraging digital tools enables educational institutions to craft tailored and engaging learning experiences for students.

- Enhanced collaboration: Digital tools streamline collaboration among students and faculty, facilitating seamless communication, resource sharing, and group project collaboration.

- Enhanced educational access: Digital tools broaden educational access for students unable to physically attend traditional institutions due to geographical or financial barriers.

Weaknesses:

- Financial Implications: The integration of digital transformation necessitates substantial investments in technology, infrastructure, and staff training, posing a significant financial challenge for educational institutions.

- Access and Equality: The adoption of digital tools and platforms may exacerbate a digital gap, restricting access for disadvantaged students who may not have the same resources as their more affluent counterparts.

- Training for Faculty and Staff: Effective implementation of digital transformation mandates educating professors and staff on utilizing digital tools and platforms, presenting a crucial obstacle to overcome.

Opportunities:

- Enhanced student engagement: Utilization of digital tools can furnish students with interactive and captivating learning encounters that enhance their engagement and drive.

- Sophisticated data analytics: Digital tools enable educational institutions to gather and analyze data on student interactions, which can be utilized to enhance pedagogical practices and strategies.

- Augmented flexibility: Digital tools empower institutions to provide adaptable learning alternatives like online and blended learning to accommodate diverse student learning styles and preferences.

Threats:

- Cybersecurity risks: the implementation of digital tools and platforms can expose institutions to cybersecurity risks such as data corruption and cyberattacks. - Technological obsolescence: the pace of technological change is fast and institutions must keep track of new developments so that they remain relevant. - Resistance to change: some teachers and staff may oppose the implementation of digital transformation, which can lead to difficulties in acceptance and implementation .

Discussion. Despite the many advantages of digital transformation in higher education, some difficulties and limitations must be taken into account. One potential problem is the need to constantly invest in technology infrastructure and support services. In addition, implementing digital solutions may require significant changes in teaching methods and course design, which may be difficult for some teachers to adapt [16].

The pressing problems of digital transformation of the educational environment of the University are an important topic for research in modern society. In the process of introducing digital technologies, the main problems faced by higher education institutions were analyzed [1].

One of the main problems is the lack of a unified strategy for introducing digital technologies into the educational process. It is advisable for each individual educational institution to develop its own plan for the introduction of digital technologies, which will prevent the possibility of causing inconsistencies and contradictions in the process of interaction of various systems and programs.

Secondly, it was considered a shortage of qualified personnel in the field of digital technology. The fact that some university faculty and administrative staff do not have

enough knowledge and skills to effectively use modern digital technologies in the educational process leads to various difficulties.

Third, limited use of digital technology may be the cause. More precisely, considering the fact that most students live in the province, the internet infrastructure does not cover remote and remote areas of the provinces, that is, the speed of operation does not even reach 0.5 Mb/s [2]. This, in turn, is a hindrance in the use of high-speed Internet and modern computers, leading to restrictions on the possibility of using digital technologies in the educational process.

However, despite these problems, the introduction of digital technologies into the educational process of universities has a number of advantages. One of the main advantages is to improve the quality of Education. The use of modern digital technologies makes it possible to improve the quality of training and increase the interactivity of the educational process [23].

The second advantage is to improve access to education. The digital transformation of the educational environment makes it possible to learn remotely without being tied to place and time, which has found its proof especially in the context of a pandemic. At the same time, this advantage opens up opportunities for training a wide range of people, including those who cannot attend face-to-face activities such as distance location or disability.

The third advantage was found to be a reduction in training time. Digital technologies accelerate learning and optimize the process of mastering the material. For example, the use of online courses allows you to study materials at your own pace, as well as repeat difficult topics without spending time on face-to-face activities.

The fourth advantage is an increase in the effectiveness of teachers. The introduction of digital technologies allows the automation of many processes related to the assessment and control of students ' knowledge, which takes time to work more creatively and efficiently. In addition, the use of online platforms allows you to reduce the time of preparation, distribution of educational materials and reduce the cost of paper documents.

Finally, the fifth advantage is to improve the quality of interaction between students and teachers. Digital technologies make it possible to carry out interactive and dynamic activities that increase student motivation and contribute to more effective learning. In addition, online platforms allow teachers to receive quick feedback from students and analyze their development in real time [21].

Developed countries have been able to master digital technologies early in the field of higher education, and their experiences have gained notable experience in the possibilities and problems associated with this process.

For example, in the United States, digitalization is associated with the need to improve the quality of education and increase access to educational resources. The use of digital tools such as online education management systems, digital textbooks, and collaboration tools has allowed institutions to create a more flexible and personalized learning experience for students. In addition, the use of online resources such as open educational resources has caused institutions to increase access to educational resources and reduce educational costs.

The use of digital technology in higher education in the UK has been linked to the need to improve efficiency and reduce costs. The use of digital tools such as cloud-based storage and collaboration tools has paved the way for institutions to simplify administrative tasks and improve communication and cooperation between faculty, staff and students. In addition, the use of online resources gave institutions the opportunity to reduce educational costs and increase access to educational resources [18].

The use of digital technology in higher education in Australia has been linked to the need to enhance student experience and improve academic performance. The use of digital tools such as online learning management systems, digital textbooks, and collaboration tools has allowed institutions to create a more engaging and interactive learning experience for students. In addition, the use of online resources has provided facilities to increase access to educational resources and improve academic performance.

Despite the manifold benefits of digitization within higher education, developed nations have encountered challenges in this transition. These include substantial investments in technological infrastructure, the imperative of training and supporting faculty and staff, and the imperative of mitigating privacy and data security risks [26].

To surmount these hurdles, developed nations have formulated comprehensive digital transformation strategies that prioritize fostering a supportive institutional culture through stakeholder engagement, encompassing ongoing evaluation and surveillance, fostering innovation, and cultivating expertise.

Through the aforementioned scrutiny, it becomes apparent that notwithstanding the array of challenges entailed in integrating digital technologies into university education, the merits outweigh the indisputable drawbacks. It aligns with the notion that each university should strike a balance between traditional pedagogical approaches and contemporary digital technologies to furnish effective and high-quality education for its students. Equally imperative is the provision of training for educators in utilizing new technologies, alongside vigilant attention to the imperatives of data security and fortification against cyber threats.

Trends in digital transformation in higher education. The trajectory of digital transformation within higher education is a pressing and highly discussed subject within academic spheres. This discourse is propelled by the significant contributions of eminent scholars, university leaders, and representatives of analytical entities engaged in higher education. Their endeavors delineate the future of higher education through the identification of key trends, technologies, and practices. These technological trajectories harbor the potential to broaden the horizons of universities, enhancing competitiveness and international recognition, while simultaneously tackling intricate challenges such as redefining educator roles and optimizing institutional financial structures [3].

Technology itself serves as a potent catalyst for educational metamorphosis, fortifying and enriching the teacher-student dynamic, fostering innovative learning paradigms and collaborative frameworks, and remedying longstanding deficiencies in educational practices. This transformation endeavors to adapt educational processes to cater to the diverse needs of all participants within the educational milieu, leveraging existing knowledge and experiences [4].

Within the realm of digital transformation in higher education, two primary domains of activity emerge: services and processes. The former entails the creation of novel services and the modification of existing ones, exemplified by transitions to online programs or electronic publications. Meanwhile, the latter focuses on the complete digitization of processes such as course enrollment and resource allocation monitoring [5].

Drawing from the advanced experiences of developed nations, it is imperative for higher education institutions to evolve into crucibles of research and innovation, fostering adaptability among professors in the pursuit of novel knowledge. Collaboration with students in continuous skill acquisition and domain-specific knowledge enrichment is essential [6].

As a vanguard in the digital economy, the United States stands as a prominent exemplar, offering invaluable insights garnered from research and analytical endeavors conducted by preeminent companies and organizations in the domain of higher education development. Concurrently, leading universities across Europe and Asia demonstrate robust utilization of such technologies and the implementation of digital transformation strategies [7].

Institutions must remain cognizant of contemporary trends and advancements to avoid falling behind the zeitgeist. Among the pivotal trends in digital transformation within higher education, personalization emerges as a cornerstone. Leveraging digital tools and platforms, institutions can furnish tailored learning experiences, attuned to the individual needs, preferences, and cognitive styles of students. Such personalized approaches hold promise for enhancing student engagement and motivation, thereby fostering improved educational outcomes [22].

Artificial Intelligence (AI): The integration of artificial intelligence into higher education is becoming increasingly prevalent. AI-driven tools and platforms have the capacity to offer personalized recommendations to students, automate administrative functions, and facilitate more efficient data analysis. Consequently, this advancement is poised to enhance both learning and teaching processes while streamlining institutional operations [19].

Mobile Learning: Mobile education represents another significant facet of digital transformation within higher education. With the ubiquity of mobile devices, institutions must ensure the accessibility and portability of their digital resources and platforms to accommodate mobile communication. This affords students the flexibility to engage in learning activities anytime, anywhere, and across various devices, thereby fostering greater adaptability and accessibility [14].

Gamification: The adoption of gamification as a digital transformation trend involves the integration of game-like elements into the learning experience. This approach holds promise for enhancing student engagement and motivation while fostering collaborative and competitive dynamics among learners.

Virtual Technologies: Virtual technologies are increasingly pervading higher education settings. These technologies facilitate immersive and interactive learning experiences, such as virtual tours, simulations, and virtual laboratories. Such innovations have the potential to augment student engagement while furnishing practical, hands-on learning opportunities [23].

CONCLUSIONS AND SUGGESTIONS.

A Methodological Approach to Cultivating a Novel Digital Culture in Higher Education.

Given the pervasive integration of digital technologies and the identified trends, there arises a necessity to imbue new competencies not encompassed within current educational curricula. Hence, the development of a novel educational paradigm and personnel training program, characterized by a revamped architecture aligned with the objectives and principles of fostering a new digital culture within the framework of the digital economy, emerges as pivotal for institutional adaptation. This initiative is essential for addressing the evolving landscape of digital education in tandem with the authentic demands of the labor market [8].

The research methodology in this domain is predicated upon the recognition of the potential of higher education and scientific endeavors as catalysts for catalyzing profound transformations commensurate with the exigencies of the contemporary era. This methodology is instrumental in aiding the attainment of strategic objectives for higher education development within a specific locale [9].

- Furthermore, the adoption of pertinent methodologies and approaches within the educational framework facilitates the acquisition of fundamental competencies by students. This encompasses not only the integration and utilization of various technologies (digital, instructional, etc.) within university settings but also entails the incorporation of theoretical and practical guidelines aimed at the systematic advancement of educational content and the enhancement of educational and training provisions under optimal conditions. The deployment of the "transformation engineering" approach within the higher education system emerges as a pivotal catalyst for catalyzing significant shifts in the educational milieu, ushering in a multitude of opportunities [24]. This approach markedly broadens the technical acumen of educators, students, and all stakeholders within the higher education ecosystem. In delineating the pathway for enhancing the higher education system amidst the backdrop of digital transformation, it is imperative to consider two key components:

Ensuring Educational Quality and Capacity Enhancement in Higher Education;

A study conducted at Ihio University underscores the pivotal importance of these dual facets in delineating a university's status and strategic direction vis-à-vis digital transformation. Within the contemporary educational landscape, ensuring quality assurance in the digital era necessitates a critical examination of the foundational principles governing educational systems, encapsulated by two key inquiries:

-What are the requisite knowledge, skills, and values?

-How can educational systems efficaciously cultivate these competencies?

This perspective directly addresses the challenges endemic to education and assumes a paramount role in institutional-level quality assurance, influencing educational outcomes.

The proposed methodology's role lies in delineating the prerequisites for educational programs, assessing their alignment with international benchmarks and technological trajectories, determining revision timelines, and elucidating the structural and conceptual interrelationships among diverse disciplines.

Moreover, the role and significance of higher education in addressing national economic challenges and augmenting institutional capacity play a decisive role in facilitating a seamless transition towards elevated levels of innovation and intensive development, particularly in developing nations. Ongoing endeavors worldwide are focused on bolstering human resource capabilities and instituting educational programs within higher education institutions. Such initiatives are aimed at equipping personnel with the requisite expertise to navigate decision-making processes essential for upgrading infrastructure, enhancing operational efficiency, and optimizing resource utilization [17, 28].

Based on the above, the following innovative decisions should be applied as an approach to transformation:

- formation of the institutional infrastructure of education and training on the basis of innovative technologies;
- development of innovative education;
- integration of Education;
- integration of Education, Science, production and business (through stakeholder relations);
- improving the education system through digital technologies;
- encourage a creative approach to teaching, initiatives
- exchange of experience between teachers;
- assistance in ensuring the quality of teachers ' activities, educational content, teaching methods.

Summarizing the above transformation trends and the main provisions of the methodology, it is worth mentioning the need for modernization in order to further improve the higher education system in relation to Uzbekistan, since it is necessary to adapt to the country's growing national economic need for highly qualified personnel. This task is repeatedly outlined in government decisions and is provided with appropriate measures at different levels of activity of all stakeholders of the higher education system. However, there are some issues that need to be considered at the governmental and institutional levels. For example, no Uzbek higher education institution is currently represented in the ranking of the 500 most common universities in the world [15]. There are many positive changes in the higher education system, both structurally and in terms of content, while it is advisable to take into account the rules specified in the justification and preliminary (at the launch stage) description of the proposed methodology.

In general, it is necessary to ensure quality education in modern educational programs in accordance with international requirements. The process of improving the effectiveness of Higher Education requires constant updating of teaching programs and skills of professors in order to maintain the quality of education within the framework of existing requirements. The level of quality of Education provides the institution with the possibility of continuous service and Development [20].

In particular, the following is expected to be provided as part of a modernized curriculum on courses obtained as a result of the application of the methodology:

- the best relationship with modern trends in research and development in a particular area;

- interaction between the education and production sector through education, training, joint research activities and publications;
- opportunities to have individual training schemes according to the needs and requirements of stakeholders [15];
- support capacity building initiatives;

In conclusion, we can say that the digital transformation of the educational environment of the university is a necessary step in the modern world to meet the needs of students and improve the quality of Education. At the same time, the introduction of new technologies is accompanied by a number of problems that need to be taken into account when using them. It is important that institutions carefully consider these advantages and disadvantages before implementing a digital transformation to ensure that it maximizes its advantages while minimizing them.

At the same time, there are difficulties and restrictions that need to be considered, including the provision of constant investments in technology infrastructure and obstacles that are faced when accessing digital resources from all regions of the Republic. Despite these difficulties, the digital transformation in higher education will continue to develop and play a decisive role in shaping the future of Education.

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