

DIGITAL TRANSFORMATION APPLICATIONS IN UNIVERSITIES IN VIETNAM, CURRENT SITUATIONS, CHALLENGES AND SOLUTIONS

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ABSTRACT

Digital transformation has become an inevitable trajectory within Vietnamese higher education today. Schools, aspiring to enhance both domestic and international rankings, elevate the standard of education, training, and management, and attract top-tier talent, must embrace a paradigm shift in learning. This transformation is imperative to meet the evolving demands of cultivating high-caliber human resources equipped with the capacity for innovation and swift assimilation of global advancements in science and technology, ultimately contributing to the nation's development in the contemporary era. This article endeavors to elucidate the various advantages and disadvantages associated with digital transformation, shedding light on the requisites and hurdles inherent in this process. Additionally, it proposes solutions aimed at capitalizing on opportunities and surmounting challenges to facilitate a rapid, seamless, and successful implementation of digital transformation in higher education.

Keywords: *Digital transformation, university, Vietnam*

I. INTRODUCTION

The global discourse on digital transformation gained prominence around 2015 and surged in popularity by 2017. In Vietnam, discussions about digital transformation gained traction in 2018, with a significant milestone being the Prime Minister's approval of the Program Converting national numbers on June 3, 2020. This transformative process represents the next phase in computerization, driven by remarkable advancements in digital technology.

Digital transformation entails a comprehensive shift in the lifestyles, work dynamics, and production methods of both individuals and organizations. In the realm of education, it manifests as a holistic transformation in teaching, learning, and management methods. Embracing digital technology is not just a choice but a necessity in higher education, as it actively supports educators by streamlining tasks like attendance-taking, paper grading, and integrating applications. The adoption of modern technology invigorates lectures, providing students with effective learning materials, diverse learning methods, and prompt updates to task requirements. Furthermore, it facilitates managers in performing their duties efficiently and expeditiously. Universities are actively undertaking digital transformation initiatives for these reasons, aiming to enhance training quality and solidify their brands.

At its core, digital transformation involves leveraging data and digital technology to revolutionize the ways individuals and organizations live, work, and produce. It signifies a transition from traditional models to digital paradigms, utilizing technologies such as Big Data, Internet of Things (IoT), and cloud computing. The evolution of digital transformation unfolds through stages like digitization, simplifying operations with software, and utilizing advanced technologies like artificial intelligence (AI) and Big Data for comprehensive data processing and analysis. This transformative journey has profound implications, touching all industries and socio-economic fields, enhancing labor productivity, fostering innovative business models, and ultimately bolstering national competitiveness. In the National Digital Transformation Program to 2025, with an orientation to 2030, education and training have been identified as one of the top eight priority areas, as per the Prime Minister's Decision No. 749/QĐ-TTg dated June 3, 2020.



Figure 1. Overview of Digital transformation

II. DIGITAL TRANSFORMATION IN UNIVERSITIES

Amidst the era of the Fourth Industrial Revolution, digital transformation stands out as the linchpin for enhancing operations and bolstering competitiveness across businesses and organizations. Its exceptional benefits include optimizing operational costs, elevating productivity and quality, and diversifying products and services. In the realm of education, particularly higher education, digital transformation presents opportunities to leverage technology for swift changes in models, organizational methods, and teaching approaches.

Traditional classrooms, burdened by drawbacks like high organizational costs, limited service space, and fixed schedules, are making way for online, remote, and virtual classes. Learning environments become more diverse, transitioning from traditional laboratories to virtual spaces where learners can engage in authentic human-to-human and human-to-machine interactions using virtual reality technology simulation software (virtual reality - VR). Big data becomes an invaluable source for experiential learning, enabling high-level analysis, trend prediction, and accurate business forecasting.

Digital learning resources bridge the gap between real and virtual spaces, offering an extensive array of materials. Libraries, no longer confined to specific locations, transform into accessible repositories that can be tapped into anytime, anywhere. Curricula become more diverse, specific, and attuned to individualized educational needs.

Cloud computing technology, marked by a large-scale information storage service model, facilitates the storage and retrieval of data related to various research work, projects, or reusable information. Schools can collaborate to build centralized virtual storage models, reducing errors and storage costs for maintaining educational data warehouses. Consequently, digital transformation enables comprehensive education without the need for face-to-face meetings, shifting the delivery method from in-person to remote, necessitating adjustments in various aspects.

Digital transformation in education and training focuses on two key areas: transforming teaching, learning, testing, assessment, and scientific research, and overhauling educational management. In teaching and learning, this involves digitizing materials, deploying online training systems, constructing virtual universities, and fundamentally transforming teaching methods, classroom management, and learner interactions into the digital realm. Learner data is meticulously tracked and stored using technology, departing from conventional record-keeping systems.

Educational management undergoes digitization, encompassing management information, interconnected database systems, online public services, and digital technologies for efficient decision-making. In output management, the latest technologies ensure that training, assessment, testing, result recognition, and degree and certificate issuance align accurately with subjects. This encompasses digitizing assessment processes and deploying computer technology applications. The comprehensive shift from traditional to digital environments extends to management mechanisms, internal organizational structures, business processes, relationships, information processing, decision-making, and problem-solving in higher education institutions.

2.1. Advantages

Digital transformation is an inevitable trend in Vietnamese higher education today, because if schools want to promote domestic and international rankings, improve the quality of education, training and management, and attract talented people, Learning requires conversion. Digital transformation is to meet the new requirements of training high-quality human resources with the ability to innovate and quickly absorb the world's level of science and technology to serve the country's development in the future. current period. The article aims to point out some advantages and disadvantages of digital transformation, thereby revealing the requirements and challenges of digital transformation. Furthermore, the article also offers some solutions to promote opportunities and overcome challenges to make digital transformation in higher education happen quickly, smoothly and successfully.

Digital transformation has become an inevitable trajectory within Vietnamese higher education today. Schools, aspiring to enhance both domestic and international rankings, elevate the standard of education, training, and management, and attract top-tier talent, must embrace a paradigm shift in learning. This transformation is imperative to meet the evolving demands of cultivating high-caliber human resources equipped with the capacity for innovation and swift assimilation of global advancements in science and technology, ultimately contributing to the nation's development in the contemporary era.

This article endeavors to elucidate the various advantages and disadvantages associated with digital transformation, shedding light on the requisites and hurdles inherent in this process. Additionally, it proposes solutions aimed at capitalizing on opportunities and surmounting challenges to facilitate a rapid, seamless, and successful implementation of digital transformation in higher education.

In the world, digital transformation started to be mentioned a lot around 2015, popular since 2017. In Vietnam, digital transformation started to be mentioned a lot around 2018. The Prime Minister approved the Program Converting national numbers on June 3, 2020. Digital transformation is the next step in the development of computerization, thanks to the remarkable progress of groundbreaking new technologies, especially digital technology. Digital transformation is the process of overall and comprehensive change of individuals and organizations in the way of living, working and production methods based on digital technologies. Digital transformation in education can be understood as the process of overall, comprehensive change in the way of teaching, learning, and management in education. Digital transformation in higher education is also an objective necessity for the following reasons: actively contributing to supporting teachers in reducing some tasks such as taking attendance, marking papers, and using applications. Using modern technology to enliven lectures... Digital transformation helps students have effective learning materials, diversify learning methods, and update task requirements quickly and conveniently. Digital transformation also helps managers do their work conveniently and quickly. It is for these reasons that universities are actively implementing digital transformation, to improve training quality and affirm their brands.

Digital transformation is the use of data and digital technology to comprehensively change the way of living, working and production methods of individuals and organizations¹. Or to put it another way, Digital Transformation is the process of moving from a traditional model to a digital model by applying new technologies such as Big Data, Internet of Things (IoT), cloud computing. (Cloud computing), ... and technology software to change management and operating methods, change processes, work methods and change organizational culture. The development process of Digital Transformation includes the following stages: Digitization is converting real information into digital form for easy storage, searching, and sharing. Applying digital to business processes, using software to make operations simpler and more effective. Digital transformation is the use of technologies such as artificial intelligence (AI), Big Data, IoT... to collect, process, and analyze data comprehensively and thoroughly, thereby leading to change. model and way of operation of the organization (see figure 1). Digital transformation has a profound impact, covering all industries and socio-economic fields, contributing to increasing labor productivity, transforming operating and business models towards innovation, from That enhances the country's competitiveness. In the National Digital Transformation Program to 2025, orientation to 2030 approved by the Prime Minister in Decision No. 749/QĐ-TTg dated June 3, 2020, education and training has been identified as one of 8 areas are given top priority in implementation.

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integrating applications. The adoption of modern technology invigorates lectures, providing students with effective learning materials, diverse learning methods, and prompt updates to task requirements. Furthermore, it facilitates managers in performing their duties efficiently and expeditiously. Universities are actively undertaking digital transformation initiatives for these reasons, aiming to enhance training quality and solidify their brands.

At its core, digital transformation involves leveraging data and digital technology to revolutionize the ways individuals and organizations live, work, and produce. It signifies a transition from traditional models to digital paradigms, utilizing technologies such as Big Data, Internet of Things (IoT), and cloud computing. The evolution of digital transformation unfolds through stages like digitization, simplifying operations with software, and utilizing advanced technologies like artificial intelligence (AI) and Big Data for comprehensive data processing and analysis. This transformative journey has profound implications, touching all industries and socio-economic fields, enhancing labor productivity, fostering innovative business models, and ultimately bolstering national competitiveness.

In the National Digital Transformation Program to 2025, with an orientation to 2030, education and training have been identified as one of the top eight priority areas, as per the Prime Minister's Decision No. 749/QD-TTg dated June 3, 2020.

During the 4.0 industrial revolution, digital transformation is identified as the key to improving operations and increasing competitiveness for businesses and organizations through the outstanding advantages it brings such as cost optimization, operating costs, improving productivity and quality and diversifying products and services. For education in general, and higher education in particular, digital transformation brings opportunities to apply technology to create rapid changes in models, organizational methods, and teaching and learning methods. Traditional classes with disadvantages such as high organizational costs, limited service space, fixed time... will be replaced by online, remote, and virtual classes. Learning spaces are more diverse, instead of traditional laboratories or simulation rooms, learners can experience learning in virtual space, and can interact human-to-human and human-to-machine in a real way through real-life interactions. virtual reality technology simulation software (virtual reality - VR). Big data will be an endless source of data for experiential learning about analysis, trend prediction or business forecasting at a high level of accuracy. Digital learning resources in terms of connecting real and virtual space will be extremely rich. Library space is no longer a specific location, but the library can exploit it anytime, anywhere. The curriculum is designed to be more diverse, more specific and better meet individualized education needs.

Cloud computing technology is characterized by a large-scale information storage service model, data related to various research work, projects or reusable information, which can be assigned to Clouds store management and can be accessed on demand, so are highly applicable in management and training activities. Schools can cooperate with other educational institutions to build an information repository (digital library, learning materials, scientific research works...) according to the centralized virtual storage model to reduce errors. Storage costs to maintain educational data warehouse. Thus, digital transformation allows education to be carried out comprehensively and completely without face-to-face meetings and communication, which means the delivery method changes from face-to-face to remote, requiring changes at aspects. Digital transformation in education and training focuses on two contents: digital transformation in teaching, learning, testing, assessment, scientific research and digital transformation in educational management. In teaching, learning, testing, and assessment, including digitization of learning materials (electronic textbooks, electronic lectures, E-learning lecture warehouses, test question banks), digital libraries, laboratories virtual, deploying online training systems, building virtual universities (cyber universities). Digital transformation is not just about digitizing lectures, or applying software to create lessons, but also about transforming the entire way, teaching methods, classroom management techniques, and interaction with learners. to the digital space, exploiting information technology to organize successful teaching. In addition, all data about the learner's learning process is also tracked and stored using technology, not through a conventional record-keeping system. Educational management includes digitizing management information, creating large interconnected database systems, deploying online public services, and applying digital technologies to manage, operate, and predict. Report and support decision making quickly and accurately. In output management, it is necessary to use the latest technologies to help ensure that training, assessment, testing, recognition of results and issuance of degrees and certificates are for the right subjects. Not only must the assessment results be digitized, but the assessment process must also be deployed and carried out using computer technology applications. Digital transformation entails changes in management mechanisms, changes in internal organizational structure, restructuring of business processes, transformation of relationships, information processing processes, decision making and problem solving. from the traditional environment to the digital environment, as well as changing the management of resources in higher education institutions.

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Firstly, the focus of digital transformation in higher education is to develop application software that can solve the problems of teaching, learning and operating a university more effectively, faster and more efficiently. more exactly. Currently, digital transformation is very convenient because there is a lot of good technology, good infrastructure, good human resources, a team of professors, associate professors, doctors... most of whom are high-level intellectuals dedicated to the field. Work in universities is an important driver of digital transformation.

The 13th National Party Congress affirmed the need to promote national digital transformation and develop the digital economy on the basis of science - technology and innovation. Implementing the Party and State's policies and guidelines on digital transformation is one of the basic tasks of higher education. Digital transformation in higher education has supported the education and training process to take place continuously even during epidemic outbreaks. Digital transformation has provided digital tools to support education and training innovation in a positive direction, applying information technology in teaching and learning, increasing the ability to self-study and research; create learning opportunities anytime, anywhere and lifelong learning. Currently, in our country many smart education models and large data warehouses containing huge amounts of knowledge have been formed; Diverse and rich learning support applications; Ways of contact and interaction between lecturers, students, schools, families, experts... are easily connected through artificial intelligence (IoT) and big data technology platforms.), internet of things (AI),...

Second, digital transformation helps teachers and learners quickly adapt and use new methods, apply modern science and technology in teaching and learning, and use tools to evaluate and compare quality according to standards. international practices to evaluate the results of implementing educational innovation goals. Vietnam has participated in PISA (Program for International Student Assessment) and university rankings, through which the Government can view the current state of the national education system and assess its scope. The importance of digital transformation in implementing comprehensive innovation in the country's education system and international integration.

Third, digital transformation also helps lecturers build B-learning, E-learning lecture systems, multiple-choice question banks, exam questions, audio and video recordings of lectures... contributing to lively content the lecturer wants to convey to learners. In the university program, students must complete a large amount of content including subjects providing general knowledge, basic industry knowledge and specialized knowledge. Every subject includes

a huge amount of knowledge. Therefore, during the teaching process, lecturers often fall into the situation of "burning lesson plans", because the time in class is not enough for the lecturer to convey all the theoretical content of the subject. But in the new era, lecturers can completely apply the achievements of new science and technology in classroom management, dividing lecture content, discussion content, self-study content and controlling learning activities. student learning through kahoot.it, pollev.com, etc. Instructors can also use virtual reality, social networks, cloud computing, etc. and can also link to many learning content other exercises related to the subject in a convenient and easy way. Digital transformation effectively supports lecturers in innovating teaching methods, shifting from mainly imparting knowledge to active teaching methods, using modern applications such as Prezi, Google drive, Top hat, Pandora,... These applications help make lectures more lively, combining many different ways of interacting with learners through listening, seeing, and feeling, from which students can maximize their potential. the abilities to remember, understand, apply, analyze, evaluate, and create from the methods that the instructor provides them. Digital transformation aims to meet learners' flexible learning needs in terms of time and location. Lecturers can use technology to design E-learning lectures with academic content, can also design vocational videos, conduct experiments, practice, give lectures, etc. Technology helps The teacher's knowledge and experience are not limited to the university campus but can be widely disseminated globally. This not only meets the needs of a portion of learners, but also creates additional employment and income opportunities for lecturers.

Fourth, digital transformation helps students look up documents for subjects conveniently with huge data sources from other students at the same school or from other universities around the world, knowledge is very updated and open, very convenient in terms of time and independent of location. Students can easily learn and improve their skills and adapt quickly to society. Looking up study results, class schedules, exam schedules, tuition fees... can be done conveniently online without wasting students' time and effort.

Fifth, digital transformation helps apply software in training management, assessment, building question banks, teaching with projectors,... but to truly exploit the huge data source, accessing the To update new knowledge and effectively apply software to support teaching and learning, universities need a widespread Internet network, students and lecturers need connection devices, power systems, and classrooms. Synchronous learning, environment and facilities for practice... These are big challenges for universities.

Firstly, the primary focus of digital transformation in higher education revolves around the development of application software designed to address teaching, learning, and university operations more effectively, swiftly, and precisely. The current landscape of digital transformation benefits from advanced technology, robust infrastructure, and a pool of highly qualified professionals, including professors, associate professors, and doctors, who are devoted intellectuals contributing significantly to the university sector.

The 13th National Party Congress underscored the imperative to promote national digital transformation and cultivate a digital economy grounded in science, technology, and innovation. Aligning with the Party and State's policies on digital transformation stands as a fundamental task for higher education. Notably, digital transformation in higher education has proven invaluable during epidemic outbreaks, ensuring continuous education and training. It has introduced digital tools that support educational innovation, applying information technology to enhance teaching and learning, fostering self-study and research capabilities, and facilitating anytime, anywhere, and lifelong learning.

Second, digital transformation facilitates swift adaptation and adoption of new methods by teachers and learners. It enables the application of modern science and technology in teaching and learning, along with tools to assess and compare quality according to international standards. Participation in international assessments such as PISA and university rankings provides the government with insights into the state of the national education system and underscores the importance of digital transformation in comprehensively innovating the country's education system and promoting international integration.

Third, digital transformation aids lecturers in constructing B-learning and E-learning lecture systems, multiple-choice question banks, and various educational resources. It supports dynamic content delivery, allowing lecturers to overcome time constraints in traditional classroom settings. Virtual reality, social networks, cloud computing, and interactive platforms enhance teaching innovation, encouraging a shift from knowledge impartation to active teaching methods. Applications like Prezi, Google Drive, Top Hat, and Pandora make lectures engaging, employing multiple interaction modes to stimulate students' cognitive abilities.

Fourth, digital transformation facilitates convenient access to subject-related documents from a vast data repository encompassing students within the same school or from universities worldwide. This decentralized and updated knowledge source empowers students to learn independently, improving skills and adaptability to societal demands. Online accessibility for study results, class schedules, exam details, and tuition fees minimizes time and effort for students.

Fifth, digital transformation extends to software application in training management, assessment, question bank development, and the use of projectors in teaching. However, to fully harness the vast data source and effectively implement supportive software for teaching and learning, universities face challenges such as establishing a widespread internet network, providing connection devices for students and lecturers, ensuring power systems, and creating suitable environments and facilities for practical applications. These challenges underscore the ongoing efforts required for the successful integration of digital transformation in higher education.

2.2. Drawbacks

Firstly, the rapid evolution of science and technology permeates all facets of socio-economic life, prompting inevitable changes across various fields and professions. Higher education, as the purveyor of high-quality human resources to meet contemporary needs and international integration, must undergo swift and profound transformations. The foremost challenge lies in altering perceptions; universities must recognize that digital transformation is an unavoidable trend and a pivotal imperative in the current era. Embracing this transformation quickly is essential to secure a prominent position both nationally and internationally. However, acknowledging the importance and inevitability of digital transformation in higher education for new initiatives encounters numerous obstacles, particularly for public universities operating under the principles of collective leadership and individual management. The dissemination of awareness regarding digital transformation's role in fostering socio-economic development has not been extensively implemented. A segment of cadres, party members, civil servants, and public employees still lacks understanding and fails to recognize the efficacy of digital transformation in operational activities. Furthermore, there is a lack of demand and perceived benefits among people and businesses to engage in digital transformation.

Secondly, habit change poses another challenge, as lecturers, students, and managers have long been accustomed to the traditional environment. Transitioning to a digital setting involves altering ingrained habits, a process that necessitates a long-term commitment, with changes implemented gradually. However, digital transformation is an urgent priority, demanding a swift shift in the habits of those in leadership roles, followed by lecturers and students.

Thirdly, the digital transformation process introduces new challenges, including the proliferation of violations such as the creation of virtual websites, impersonation, websites disseminating distorted and reactionary content. The dynamic nature of digital content, changing every day and every hour, poses difficulties for lecturers in maintaining control. Confidential information, including exam questions, personal details, and lecturers' accounts, is susceptible to hacking risks. False reports and uncontrolled dissemination of information online can harm the reputation and life of lecturers. Additionally, cybercrimes such as scams, bullying, cyberbullying, and pages associated with hate groups and terrorist organizations emerge. While information is readily available, each search can yield millions or billions of results, making it challenging for students to discern reliable sources. Lecturers bear the responsibility of guiding students in navigating this landscape, requiring regular access and search activities to stay updated and provide direction on trustworthy information sources.

2.3. Digital transformation at some Vietnamese universities

National Economics University has rapidly embraced and implemented information technology across education, training, scientific management, and services to promptly maximize benefits for both teachers and students amid the current era of the Fourth Industrial Revolution. The introduction of innovative learning methods, such as E-learning online classes, project-based learning, and virtual reality applications, has allowed for personalized learning experiences, thereby enhancing overall learning and teaching efficiency. Smart electronic equipment systems in classrooms, transformed into smart classrooms, are complemented by management software that aids lecturers in comprehending students' learning progress.

Digital transformation at National Economics University extends to various operational processes, including online credit registration for subjects, electronic circulation of official dispatches and documents, general services management, and learner support and consulting processes.

Similarly, Foreign Trade University, with its expansive student body, has invested in and completed an information technology infrastructure system, including Leased Line transmission and wifi capabilities. The university actively promotes online interaction to foster innovation and collaboration among lecturers and students. The library has transitioned to an electronic model, evolving into a digital library, enhancing management capacity, service quality, and professional skills of library staff.

Hanoi National University's mobile application houses a digital learning resource warehouse with over 102,000 digital books and textbooks, indicating a growing number of learners and researchers accessing digital resources. The university's library has achieved global recognition, ranking 65th out of 3,942 global digital resource repositories—a significant stride in digital transformation implementation.

Hanoi University of Science and Technology has streamlined its online student management process into four fundamental steps, leveraging an online system for student account creation, form submission, online request processing by teaching staff, and subsequent notifications via email. This process ensures the continuous flow of teaching and learning activities, particularly important during the current epidemic scenario.

Thuongmai University has deployed the Trans software system for online teaching, providing training to lecturers and administrators, offering user accounts, and ensuring uninterrupted teaching and learning activities amid the pandemic. The university has also digitized student data, implemented online student management, and introduced various student support services.

In general, Vietnamese universities have embarked on the digital transformation journey, tailoring their approaches based on individual characteristics and contextual needs. The initial stages involve digitizing educational materials, implementing online teaching, and partially managing student affairs, reflecting a collective effort toward embracing digital advancements in higher education.

III. TRENDS AND SOLUTIONS

3.1. Digital transformation trends in Universities

Recent studies have identified several digital transformation trends in major universities globally, along with the potential effects of digital transformation:

- (1) Expanded Target Audience and Increased Enrollment:
 - Combining online and face-to-face training to reach a wider audience.
 - Reducing costs while enhancing training quality.
- (2) Data Analysis for Continuous Improvement:
 - Collecting and analyzing large sets of learner data.
 - Identifying factors affecting learning outcomes to refine policies, teaching methods, and assessment approaches.
- (3) Business/Industry Collaboration for Skill Development:
 - Establishing direct/online connections with businesses to impart necessary skills.
 - Facilitating immediate employment opportunities for graduates.
- (4) Augmented Virtual Reality for Interactive Learning:
 - Implementing augmented virtual reality applications.
 - Creating interactive learning environments to enhance the overall learning experience.
- (5) Personalized Learning Through Artificial Intelligence:
 - Applying artificial intelligence to customize the learning process.
 - Supporting improvements in teaching, management, and overall effectiveness.

3.1.1. Requirements:

- (1) Mindset Adaptation:
 - Leaders, lecturers, and learners must adapt to rapid changes and embrace new habits and processes.
- (2) Basic Technology Knowledge:
 - Managers, lecturers, and learners should possess fundamental knowledge of technology usage.
- (3) Infrastructure Improvement:
 - Upgrading technology infrastructure, including networks, computing systems, and teaching equipment and software.

3.1.2. Challenges:

- (1) Digital Transformation Readiness:
 - Assessing the ability and readiness of leaders, lecturers, learners, and relevant stakeholders for the digital transformation process.
- (2) Initial Investment Costs:
 - Coping with high initial investment costs compared to immediate effectiveness.
- (3) Limitations in Infrastructure:
 - Addressing challenges related to transmission lines, bandwidth, and software and equipment support for teaching and learning.

3.2. Solutions:

- (1) Awareness and Training:
 - Promoting awareness and understanding of digital transformation.

- Focusing on security and information safety for students during digital transformation.
 - Strengthening inspection and supervision of implementation.
- (2) Professional Development:
- Regularly improving professional qualifications, technology proficiency, and foreign language skills for students, lecturers, and administrators.
- (3) Resource Allocation:
- Allocating funds, time, and efforts for focused study and qualification improvement.
 - Developing digital technology resources to foster a digital economy.
- (4) Government Support:
- Implementing policies of interest, support, and investment for smooth digital transformation.
 - Providing preferential policies for infrastructure, administrative procedures, and overall support.
- (5) Innovative Leadership:
- Encouraging a culture of innovation and readiness to adopt new products, services, and models.
 - Reviewing and developing mechanisms and policies, including intellectual property protection.
- (6) Information Systems Development:
- Building information systems and databases on cloud computing infrastructure.
 - Implementing regulations for sharing information through networks among domestic and international universities.
- (7) Cybersecurity Measures:
- Ensuring safety and network security as a pivotal part of digital transformation.
 - Establishing and operating effective Cyber Security Operations Centers (SOC).

Leadership plays a crucial role in the successful implementation of digital transformation tasks, motivating stakeholders to actively participate in the process and turning its outcomes into evaluation criteria. Building information systems, ensuring network security, and leveraging big data are essential elements for a sustainable and successful digital transformation in higher education.

IV. CONCLUSION

Digital transformation in education, particularly in higher education, plays a pivotal role in the overall development of the country. In Vietnam, the implementation of digital transformation in higher education is progressing rapidly, enjoying significant attention, guidance, and investment from the Government and the Ministry of Education and Training. Despite this momentum, challenges related to infrastructure, resources, and technology hinder the ability of Vietnamese higher education institutions to undertake comprehensive and synchronized digital transformation.

The success of the digital transformation process hinges on several factors:

- (1) Government Support and Policies: Supportive policies from the State are essential for creating a conducive environment for digital transformation in higher education.
- (2) Determination of Stakeholders: The determination of leaders, lecturers, and students at all levels is crucial. Their commitment is necessary to overcome challenges associated with digital transformation policies, facilities, and communication.
- (3) Infrastructure and Resources: Addressing gaps in infrastructure, resources, and technology is fundamental for a complete and synchronized digital transformation in higher education.
- (4) Awareness and Communication: Fostering awareness among all stakeholders about the benefits and importance of digital transformation is key. Effective communication strategies can bridge understanding and cooperation.
- (5) Opportunity Utilization: Seizing opportunities presented by the digital era and leveraging them for the advancement of higher education.
- (6) Overcoming Challenges: Actively addressing difficulties and challenges associated with policies, resources, and communication channels is necessary for a smooth digital transformation.

By capitalizing on opportunities, addressing challenges, and fostering a collective commitment among leaders, lecturers, and students, the digital transformation process in higher education can unfold conveniently and, more importantly, effectively. The collaborative efforts of all stakeholders, combined with supportive policies and a strategic approach, will contribute to the successful integration of digital transformation, paving the way for enhanced educational experiences and outcomes in Vietnam.

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