Digital Transformation in University Governance: Needs and Challenges from Vietnam's University Training System

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Abstract:

Higher education that implements digital transformation can provide more learning possibilities at lower costs and more effectively than before because schools will have to spend less money on issues such as premises, facilities, and devices... This article examines the opportunities and problems associated with digital transformation in Vietnam's public higher education institutions. The essay also examines factors to explore the levels of digital transformation and the digital transformation framework, as well as analyzes digital transformation in education in general and higher education around the world, with implications for higher education institutions in Vietnam.

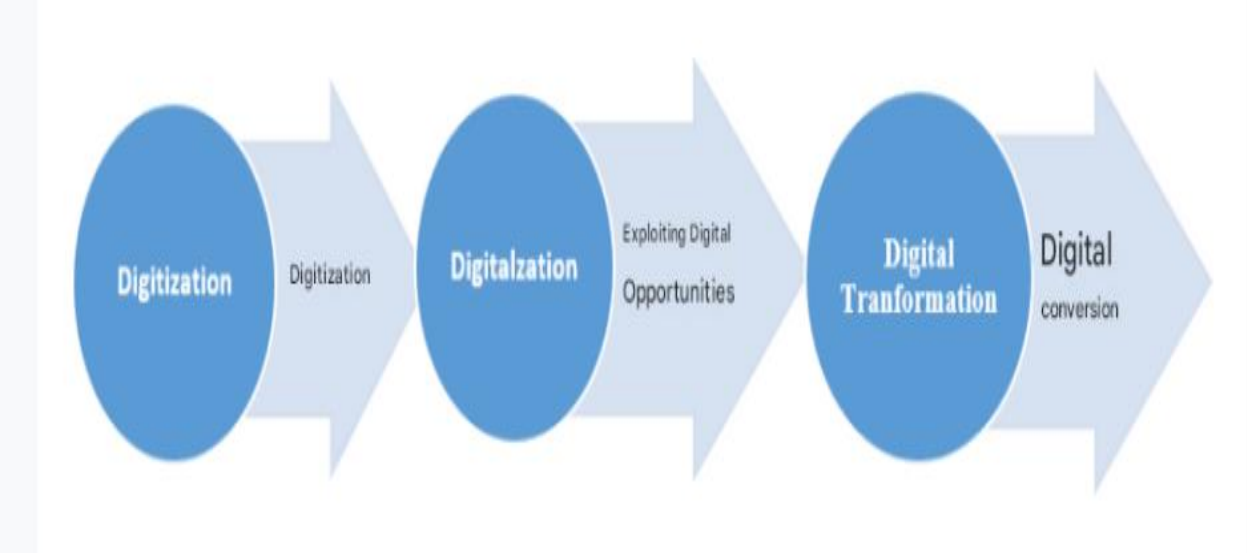
Keywords: digital transformation, university administration, training program, artificial intelligence, students, university, Vietnam.

1. Introduction

Digital transformation is a fairly new concept that emerged along with the concept of industry 4.0 and the 4th industrial revolution, therefore, digital transformation itself is also defined, understood and applied according to approaches that are not completely uniform. Young and Rogers (2019) argue that digital transformation is a process of change that stems from the ubiquitous presence of data, connectivity, and decision-making, helping to transform products, processes, and organizational structures. According to , digital transformation is the process of applying and deploying digital technology by an organization to create new products, services and activities or modify existing products, services and activities by translating business processes into digital formats. Meanwhile, IBM believes that digital transformation is this initiative that evaluates and modernizes the organization's processes, products, operations, and technologies to enable continuous, fast, and customer-driven innovation. In higher education, digital transformation is seen as a way to attract upper-class students, improve the student experience, provide quality

teaching materials, and provide blended learning (Pridmore & Godin, 2021) (Mhlanga et al., 2022) (Farias-Gaytan et al., 2023) ("Digital Transformation and Higher Education: A Survey on the Digital Competencies of Learners to Develop Higher Education Teaching," 2020)

In Vietnam, according to the definition of digital transformation by the Ministry of Information and Communications, the specialized management agency of information technology and digital transformation is the process of overall and comprehensive change of individuals and organizations in terms of way of life, way of working and production methods based on digital technologies. Digital transformation is understood in the sense that the process of changing from a traditional organizational model to a digital organization or business by applying new technologies, such as: Big Data, Internet of Things (IoT), cloud computing (Cloud)... in order to change the mode of administration, leadership, working processes, organizational and business culture. With a fairly comprehensive impact on today's life, the concept of digital transformation is used inconsistently, which makes the concept of digital transformation confused with other concepts such as digitalization and digital applications. Figure 1 shows that defining 3 levels of digital transformation will help clarify the scope and extent of related activities. Specifically, as follows: (Anh & Huu, n.d.) (Minh City Ho Chi Minh et al., 2022) (N. H.-R. de I. U. del & 2021, n.d.)



Level 1: Digitazation is the transformation of entities (objects in reality) from natural, physical to numerical, i.e. creating digital versions of entities. The simplest example of digitization is documents and papers stored in paper form that will be scanned and identified (or entered) to form digital data. (TO & NAM, n.d.)

Level 2: Exploiting digital opportunities (Digitalization) is the use of digital technology and data in the organization's operational processes. This is the application of digital technology when digital opportunities appear more and more. The essence of this level is adaptation, and organizations must always innovate their operating models, business models to seize these opportunities. (N. H.-R. de I. U. del & 2021, n.d.)

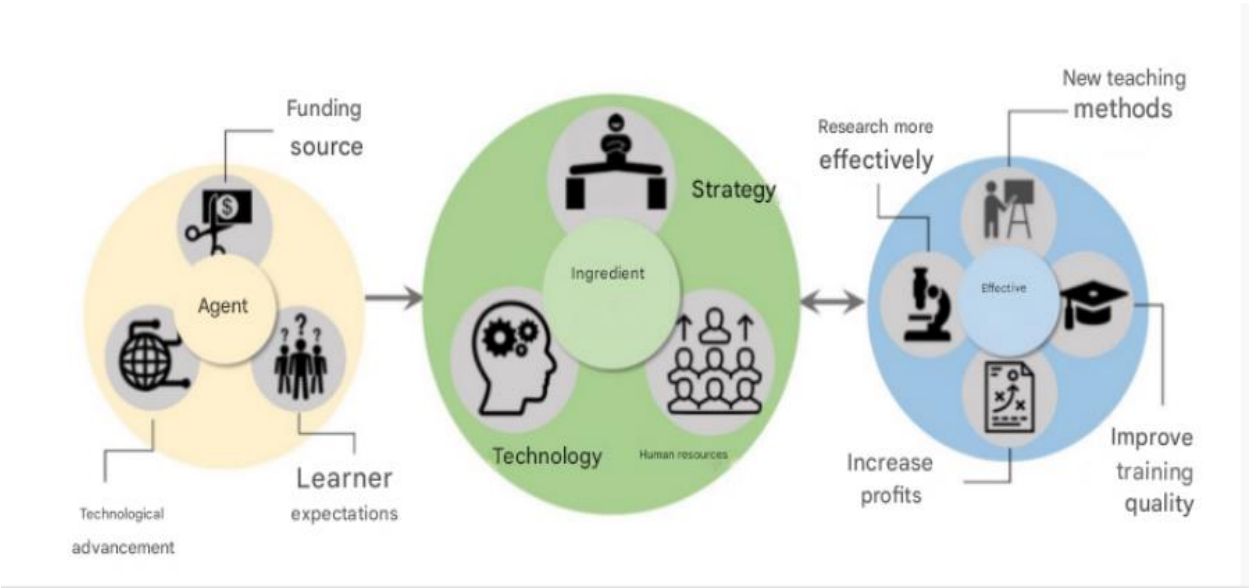
Level 3: Digital Transformation is the process of overall and comprehensive change of individuals and organizations in terms of how to live and work in the digital environment, with digital technologies. The essence of digital transformation is creativity. Although there are different definitions and classifications, we can see some key points related to digital transformation, which will serve as a reference in the process of identifying and proposing digital transformation for any organization. In general, there are 3 main points that are the connotation of digital transformation activities: (1) Application of digital technology; (2) Changing the business model/operating model; (3) Create new value, new services. (Economic & 2020, n.d.) (H. D.-R. de I. U. del & 2022, n.d.)

Recent studies have shown a number of trends in digital transformation in major universities around the world as well as the effects that digital transformation can bring, such as expanding the audience of learners, increasing enrollment targets by combining online and face-to-face training; reduce costs but increase training quality. In addition, collecting and analyzing big data of learners to find out the factors affecting learning outcomes, thereby making adjustments to policies, teaching methods, and assessment methods to improve the quality of training and meet the increasing requirements of learners as well as society. The training institution uses a direct/online connection network with businesses/employers to train the necessary skills and knowledge, helping learners to be able to work immediately after graduation. They also apply augmented reality to create an interactive learning environment, enhancing the learning experience for learners. Many universities also use artificial intelligence to personalize the learning process, support to improve the efficiency of teaching, management, and teaching (Habib, 2023)

2. Digital transformation theory analysis framework

Simply put, digital transformation is "a change in the way an organization operates to improve the quality of products and services by exploiting the application of technology and data". For higher education, this goal is to improve the effectiveness of governance, improve the quality of training, and serve the development of the country. In essence, digital transformation does not change the core values or model of a higher education institution, but rather a transformation of core activities through technology and digital platforms, and at the same time seizes the opportunities they bring. In other words, digital transformation is the intersection of technology and training strategies (figure 2)

Figure 2: Factors to exploit digital transformation in higher education



Source: Proceedings. IATED, 2019.

Digital transformation in education in general, or more specifically for educational institutions, digital transformation activities will also have to be implemented from the definitions and approaches as presented above. The uniqueness of each organization will be clarified when answering the questions: (1) What services does the organization provide? (2) Who are the organization's customers? What services do they participate in? (3) Administrative and operational activities of the organization to ensure the effective provision of services to customers The digital transformation of leading universities in the world and the region such as universities in the US (Harvard, Stanford, Massachusetts Institute of Technology), National University of Singapore, etc There is little information about the transformation plans or activities of these schools. This can be explained by the fact that large universities have implemented the application of digital technology and information technology in teaching, learning and providing services and utilities for a long time. The concept of digital transformation itself is new, while the connotation of digital transformation jobs has been applied in practice by schools around the world before. Schools all offer mass courses (MOOCs) for learners who can enroll and attend classes for free. However, only individuals who pay the fee will be tested, tested, and issued a valid, globally recognized certificate. Or like edX is Harvard's online learning platform, Udacity is Stanford's online learning platform that has been deployed, attracting a large number of learners. (Corbeil & Corbeil, 2022) (Alenesia & Akour, 2023) (Giang et al., 2021)

A number of large technology companies also invest in and provide digital transformation solutions in education and have proposed a framework model as a reference basis when applying. Typically, Microsoft has launched a Digital Transformation Framework specifically applicable to education (Figure 3).

Figure 3: Digital transformation framework in education as defined by Microsoft

Source: https://learn.microsoft.com/en-us/training/educator-center/

Microsoft's digital transformation model in education includes:

(1) Leadership and policy: Vision for change; Inclusion and accessibility; Strategic planning and quality assurance; Partnerships and capacity building within the University.

(2) Modern teaching and learning: Developing teaching capacity for teachers and leadership skills; Develop curricula and teaching tools; To develop an environment of self-study and self-research; Continuous learning experience.

(3) Smart learning environment: Purpose-oriented learning space that is easily accessible to learners; Design a sustainable and responsive environment for learners: Smart and security-integrated environment: Facilities management.

(4) New technology design: Operation management and Information Technology; Learning equipment; Insights for data direction; Collaborative learning platform.

Thus, Microsoft offers a digital transformation model in education in the direction of approaching the Digital Transformation Reference Framework, so that it can be referenced and concretized to apply to each separate educational unit and organization. Microsoft emphasizes the leadership factor, the vision of the leader and the focus on two main contents: modernizing the learning environment and teaching and learning modernly. (Barzman et al., 2021)

3. Results and Findings

According to the Preliminary Report on Digital Transformation and Administrative Reform of the Ministry of Education and Training (2024), the education and training sector has completed the construction of 100% of the education sector's databases. In particular, the database on higher education (HEMIS) with 470 higher education institutions, over 25,000 training programs, over 100,000 staff profiles, nearly 3 million learner records. (Shenkoya & Kim, 2023)

Figure 4: Requirements and challenges of digital transformation in higher education

Request	Challenge
(1) Must have a mindset that adapts to rapid changes and accepts change, from habits to business processes. (2) There must be basic knowledge of the use of technology in both managers, lecturers and learners. (3) Technological infrastructure (network and computing systems), teaching and learning equipment and software must be improved.	(1) Ability and readiness for the digital transformation process, understanding the meaning and core values of digital transformation of leaders, lecturers and learners and related parties. (2) The initial investment cost for digital transformation is high compared to the initial efficiency. (3) Limitations on transmission lines, bandwidth and software and equipment to support teaching and learning.

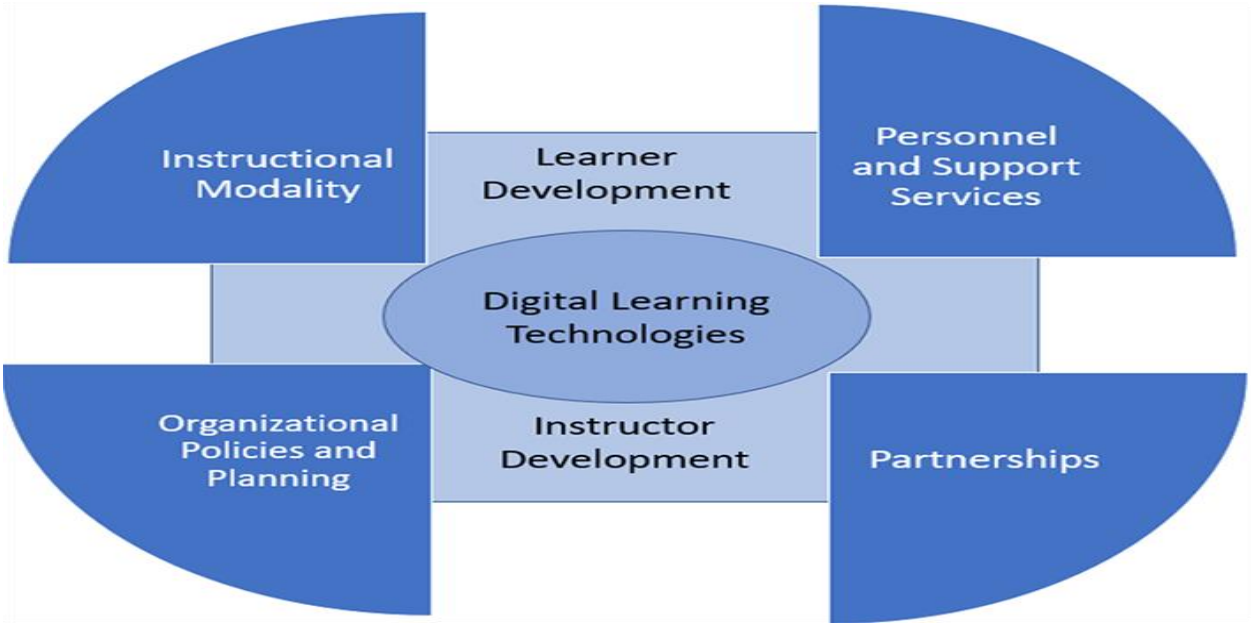
Indeed, universities in Vietnam have increasingly invested in and developed platforms to support professional and academic activities in the system, such as digital

libraries and academic administration systems. However, these platforms are still fragmented, not connected throughout the system, have not fully exploited technological advances to serve training, have not really supported the administration and management and have not met the increasing requirements of learners. especially in the context of the COVID-19 pandemic. The implementation of comprehensive digital transformation in universities in Vietnam is a mandatory requirement. However, this process needs to consider the existing conditions in terms of technological infrastructure, funding, synchronization and readiness of member universities. The basic requirements to be met for digital transformation include: (Bisri et al., 2023) (Fernández et al., 2023)

Maintain continuity and adaptability of training activities

The pandemic has disrupted the traditional classroom model. All training activities must be posted online. The implementation of digital transformation is to maintain the continuity and adaptability of training activities. To achieve this goal, digital transformation needs to meet the following conditions: All subjects need to be compiled with content that can be taught both online and onsite. Course syllabus and materials must be fully updated before the new course begins. Ensure that the minimum conditions on transmission lines, bandwidth and necessary equipment are met. Have a plan to provide financial support or borrow equipment for learners. Organize basic training courses for lecturers and staff on how to operate and operate in the digital environment. Adding to the training program a number of compulsory basic subjects in technology to provide minimum knowledge to help learners integrate into the digital education environment. Establish a working group on digital transformation to determine standards and criteria; select the implementation method; develop and promulgate statutes and regulations (Figure 5) (Maguatcher & Ru, 2023)

Figure 5: Digital transformation model in higher education



Source: Gkrimpizi (2023)Classification of barriers to digital transformation in higher education institutions: Systematic literature review

Teaching methods that meet high-tech requirements - highly interactive

An important component of the digital transformation process in universities is the blended learning model. This model is learner-centered, emphasizing the ability to self-study, self-research, and the ability to ask questions and discuss, helping learners develop the necessary skills, meet the requirements of employers, and be practical for the industry. However, to implement a mixed teaching model, it is necessary to have a massive open learning material repository (MOOC) with a system of highly interactive and pre-compiled lectures, exercises, and materials. This is a significant challenge in the initial step of implementing digital transformation because in addition to the investment cost to implement, it also requires the perseverance of lecturers. To implement the hybrid training model well, it is necessary to meet 2 requirements: Taking advantage of digital tools and platforms to provide knowledge continuously, anytime, anywhere for learners. Provide opportunities for learners to access the real environment through co-training with businesses. With this approach, learners will experience new learning models: learning by practical experience, learning by problem-solving methods, learning how to integrate into the real environment, etc. (Weerawardane, 2021) (Bećirović & Dervić, 2023; Pinheiro et al., 2023)

Building a teaching team that meets high-tech and highly interactive requirements

Lecturers need to be equipped with skills in technology and pedagogical methods to implement digital transformation, including teaching methods according to new approaches, methods of operating digital tools/environments, how to compile digital documents, build interactive lectures, etc. This is a long-term strategy, which needs to be prepared step by step when implementing digital transformation, through the following activities: (Sararuch et al., 2023; Stoika, 2022; Valdés et al., 2021)

- Organizing training courses: teaching with technology, teaching in a mixed model, training in the use of digital tools and platforms...
- Organize the design/recompilation of subjects according to the mixed teaching model, open learning material model, interactive lessons, etc. Some subjects can refer to or use learning materials and documents from advanced universities in the world.
- Promote the form of rewarding lecturers with excellent teaching achievements, forming a network of excellent lecturers for them to guide their colleagues in their faculties/departments.
- Opening training programs, sending lecturers to study and experience in domestic and foreign technology units within the framework of the PHER project.

Digital transformation for scientific research activities

Currently, scientific research activities at universities are shifting their focus to data. Implementing digital transformation in scientific research needs to focus on building data centers and connecting platforms to form a network of domestic and international scientists to solve major problems. Specifically, such as:

- Build a large data center to collect and accumulate sample data and experimental data in all fields. By jointly solving the problems of using shared datasets, research works will be linked to each other, promoting cooperation, sharing results, and co-testing. In addition, big data centers also provide computing capacity, supporting experiments on big data. (Mikheev et al., 2021)
- Developing a scientific consulting network: this will be the place where research proposals are publicly commented/evaluated, where businesses put their research papers, where research proposals are received and funding for implementation. (Díaz-García et al., 2022)
- Forming startup centers is a place to incubate potential research results and trade exhibitions, where start-up products are introduced, cohesion between stakeholders in the ecosystem, and are ready to cooperate in investing in large-scale production. (Tungpantong et al., 2022)

Expanding learners, expanding access to technology for learners

With the availability of digital classrooms, digital materials, and open learning materials, the university's learners will no longer be constrained by age. Anyone, anywhere, or anything can participate in learning and receive a diploma. Restrictions on the size of the school or geographical distance will no longer be available. Since then, training targets and contributions to the socio-economy have also increased. To improve their ability to access technology, learners need to have conditions to access and interact with the digital environment in both online and face-to-face learning. Therefore, we need (Díaz-Garcia et al., 2023; Gkrimpizi et al., 2024; Yavuz et al., 2023)

- Establish technology interaction laboratories with full necessary equipment and supporting tools. Learners can realize their ideas or projects.
- Building extracurricular clubs, popularizing necessary technological knowledge for new learners.
- Integrate virtual reality, augmented reality, and mixed reality into the classroom. This is an effective assistant for learners to experience technology.
- Minimize the issuance of traditional books/materials. Instead, providing digital learning materials, an open learning material repository for learners.
- Open channel 24/7 to answer general questions and provide technical support. (Fig 6) (Kuzu, 2020; Mohamed Hashim et al., 2022; Nguyen-Anh et al., 2023)

Figure 6: Components of digital transformation in higher education

Source: Competing on analytics." INTED2018 Proceedings. IATED, 2018.

4. Discussion

In addition to the utilities that help learning and teaching become lighter and smarter, digital transformation in higher education still faces many obstacles and challenges as follows:

Strategic challenges: Universities have not yet developed and implemented long-term digital transformation strategies to bring value to learners from teachers and training systems. This depends on the vision and action perspective of the school's leadership, digital transformation should not be considered only as short-term digital initiatives, such as: deploying application software, but must be identified and communicated as a long-term strategy of the school. (Antonopoulou et al., 2023)

Challenges in investment costs: In fact, investment in digital transformation is the nature of technology investment, which is high risk, this is also a general trend that is developing, so the evaluation criteria are still unclear and very difficult to quantify. Digital transformation has a lot of hidden costs, in addition to an obvious cost of software, the costs of time, training, operation... is also a very significant amount. Therefore, calculating costs, assessing profitability and mobilizing capital to implement digital transformation is a difficult problem for any unit, including universities. Meanwhile, investing in digital transformation, especially at universities in Vietnam, is a huge and long-term amount, with

many potential risks, depending on the partner providing the platform, the development of science and technology, as well as the suitability of each university. (Castro Benavides et al., 2022)

Challenges in technology resources: For online education, all inputs to the education process must be digitized, the most important of which are learning materials, materials, and textbooks. All data on learners also needs to be digitized to implement the learner management process and evaluate the learning process and outcomes. Network infrastructure, information technology equipment, transmission lines, and Internet services for schools, teachers, and students - especially in remote and disadvantaged areas - are lacking, outdated, not synchronized, and many places have not met the requirements for digital transformation (both in terms of education management and teaching and learning). In addition, because most schools have the characteristics of education and training, they lack resources, especially the information technology department, which is also a big obstacle for Vietnamese universities in implementing digital transformation. (Suárez et al., 2021)

Challenges in human resources deployment in 3 perspectives at Vietnamese universities: (i) Regarding the lack or inability of officials and staff in management and support departments to deploy the use of digital platforms; (ii) Low digital proficiency of teaching staff, especially middle-aged staff, who have a lot of experience but limited exposure to technology; (iii) The generation gap between students who are considered proficient in digital technology and lecturers and academies must adapt and learn how to use technology. This generational gap creates significant psychophysiological barriers for participants in the transmission and reception of knowledge. (Taher, 2023)

Challenges to change pedagogy and curriculum: Digital transformation is not only limited to digital documents and online teaching, but also requires the creative participation of lecturers and researchers in building and implementing new teaching and learning models and environments; in other words, the transformation of the entire teaching method, classroom management techniques, interaction with learners to the digital space, and the exploitation of information technology to organize successful teaching. This work requires the research and application of neuropsychology and artificial intelligence science to content design as well as teaching tools, taking advantage of the strengths of technology to implement personalized educational programs, which cannot be done with traditional face-to-face training with a large number of students (50-60 students students/class) as in big cities in Vietnam. (Abad-Segura et al., 2020)

Challenges in data security and related legal issues: Digital technology connects everything with many benefits and opportunities, but also has many potential cybersecurity

risks. Collecting, sharing and exploiting education management data and digital learning materials need a common legal corridor in accordance with regulations on copyright, intellectual property, information security, electronic transactions and the law on sharing and providing information (Rogozin et al., 2022)

5. Conclusion

The transformation in higher education is not simply online teaching. It is the technologicalization of the entire teaching and learning process, the automation of professional and management processes, the expansion of teaching objects, capacities, and scope of teaching, the improvement of training quality and the ability to respond to the industry... This needs to be done in aspects such as raising awareness of the importance of universities in digital transformation to build a digital culture in higher education. In order to have strong transformations in university governance, teaching and learning, it requires a change in the mindset and perception of each person from school leaders to lecturers, staff and learners. In order for the university to operate effectively in digital transformation, the university must build a remote working culture instead of a face-to-face working culture, such as: traditional; develop a standard code of conduct for officials and students when working in cyberspace; building a culture of lifelong learning among staff, lecturers, and experts and promoting academic integrity when data is easily exploited via the internet. training services need to carry out digital transformation through many aspects, including shortening the enrollment process by using digital tools, organizing teaching in a digital environment so that students can study in any location with an internet connection, without having to go to school. Moreover, distance learning needs to be through Microsoft Teams, Zoom, Google Meets, and a few others. Build pre-recorded lecture videos to upload to websites. Connect electronic payment methods and register for online learning. Universities need to implement the EMS (Education Management System) university management platform in the management, administration, and overall management of activities, from facilities, human resources, to students, student unions, classes and training management activities. Interactions between learners, lecturers, and managers are carried out through the digital management platform. Universities need strong digital transformation in the field of scientific research. This is one of the important pillars of a university, so the digital transformation process in scientific research has also received great attention from universities. Digital transformation in scientific research must first of all help lecturers and students have the conditions to participate in many domestic and international scientific conferences carried out in the digital environment. Lecturers and students must be exposed to and exploit scientific documents in the digital environment to serve the scientific research process such as monographs and published scientific research works. In addition, the university's scientific research in the digital transformation process

is also carried out in the direction of helping to promote the digitalization process at businesses. Higher education institutions in Vietnam focus on training personnel to meet the requirements of digital transformation. The first trained team is lecturers, because lecturers decide the quality of the school's training and lecturers are the key factors in operating the training system, daily contact with students in the digital environment. Lecturers must be trained to be able to use digital tools in online teaching, online student assessments, and support students in online learning. Lecturers must also be proficient in exploiting online resources for scientific research and guiding students in scientific research. The team of managers and experts of functional units is in charge of managing the school using digital tools. This staff must be educated to use digital platforms proficiently, such as training management, student management, human resource management, financial management, facilities management, and digital resource management.

Ethical Statement

No animals were used in this study; thus, no ethical approval is required.

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Declaration of Conflict of Interest

The author declares no conflict of interest.

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