FROM DIGITIZATION TO DIGITAL TRANSFORMATION: THE INEVITABLE JOURNEY OF EDUCATION VIETNAM IN THE 4.0 ERA

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Abstract: In the context of the fourth globalization and industrial revolution, digital transformation in education has become an indispensable requirement for Vietnam. This is not only the process of digitizing documents, but also a comprehensive application of digital technology, large data, artificial intelligence, cloud computing and digital platforms to management, teaching, learning, testing and evaluation. Digital transformation contributes to building an open, flexible education, taking learners as a center, and meeting the requirements of developing high quality human resources and international integration. However, this process also faces many difficulties: regional differences, infrastructure limit, uneven number capacity of the teachers, the same requirements to ensure equity by education. Therefore, transforming numbers is both a strategic opportunity and a great challenge in the process of basic and comprehensive renovation of Vietnam today.

Keywords: Digital transformation; Vietnamese education; digital technology; human resources; International integration.

Introduction

Currently, before the trend of digital transformation (CĐS), Vietnamese education cannot stand out. This is an objective requirement that comes from the rapid change of science and technology, the needs of learners, and the country's development goals. Successfully implementing digital transformation in education not only improves the quality of teaching and learning, but also contributes to affirming the position of Vietnam in the global knowledge economy. The fourth globalization and industrial revolution, digital transformation has become an objective and irreversible trend, extensive impact on all areas of social life, including education and training. For Vietnam, digital transformation in education is not only a mandatory requirement to adapt to technological development, but also a strategic solution to improve the quality of human resources, meeting the national sustainable development needs. In fact, in the educational environment, digital transformation is reflected in many aspects, but basically focused in aspects such as: E-Learning, Virtual Classroom, personalization of learning, using artificial intelligence (AI) in supporting learning and evaluating, school administration through integrated information systems, open learning and learning warehouses for life. This is a comprehensive, long -term, unlimited process of technology application, so the digital transformation is considered an important driving force for the basic educational innovation process. Therefore, the research and learning about the topic of Vietnam Education before the trend of digital transformation and one of the theoretical and essential practical issues in the current period of Vietnam

Research results

Digital transformation in education and the inevitability of Vietnamese education before the trend of digital transformation

Digital transformation in education is the process of comprehensive application of digital technologies in order to basically change the organization, management and implementation of educational and training activities, thereby improving the effectiveness of teaching, learning and system administration. Digital transformation including innovation in thinking, processes, organizational models and educational culture. The XIII Congress of the Communist Party of Vietnam, the concept of digital transformation is clearly defined as a key and throughout task in the orientation of national development until 2030, vision to 2045. The Congress pointed out, need: "Promote national digital transformation, digital and digital economic development. Create breakthroughs in basic innovation, comprehensive education and training, science and technology ..." The determination of education and training is the key field of national digital transformation is not a random choice, but based on scientific awareness and practice of education plays a key role in human development strategy - central factor, determining the success of all conversion. In the context of the knowledge economy, innovation and technology is the main driving force for

growth, people - with numerical thinking, digital capacity and adaptability are the "knot" that needs to be removed first.

In essence, when it is said that the digital transformation in that education is also a comprehensive application process and a system of digital technologies, large data, artificial intelligence, cloud computing and digital platforms into all activities of education and training. This process does not only stop at digitizing documents or online teaching organizations, but also includes the renovation of management, teaching, learning, testing - evaluation and provision of educational services. The core of the digital transformation in education is to change the operating model, from traditional approach to data and technology -based approach, thereby improving the flexibility, personalization and approach of learners. At the same time, it allows teachers to renovate teaching methods, manage the school more transparent and the educational system adapts to the context of globalization. Digital transformation in education is not only a technical trend, but a development strategy, contributing to building high quality human resources for digital era.

The problem here is that we also need to distinguish between digitization and digital transformation in education. Digitalization in education is understood as the process of converting information, documents, lectures from traditional forms to digital forms to facilitate storage, access and sharing. This is mainly technical activities, saving time, cost and gradually creating a technological foundation for the school. However, digitization does not change the nature of teaching methods or educational management models. In contrast, digital transformation in education is the process of comprehensive application of digital technology to restructure management, teaching - learning and testing - evaluation. Digital transformation not only improves the old way but also creates new educational models: combined learning, personalization of learning roadmap, management based on data, and flexible and expanded educational services. Thus, it can be understood simply: Digitization is the beginning step, and the digital transformation is a strategic development step, determining the quality and effectiveness of education in the digital era.

And in the context of the fourth industrial revolution and the strong development of knowledge economy, digital transformation has become an indispensable trend on the global scale. For Vietnam, this requirement is even more evident when the country is promoting industrialization, modernization and extensive international integration. Education - Training, as the foundation for human resource development, cannot stand outside this process.

Firstly, digital transformation is a strategic solution to implement the basic and comprehensive renovation goal of education in the spirit of Resolution 29-NQ/TW, aiming to build an open, flexible education, meeting the needs of lifelong learning. The most recent is the Politburo's Resolution No. 71-NQ/TW of August 22, 2025 on breakthrough education and training, including a breakthrough on education and training development by comprehensive renovation of institutions, policies, school models and teaching and learning methods, with specific goals such as raising teachers for teachers, providing free textbooks for students in 2030, building universities up to international standards and developing modern education to take students as the center.

Secondly, the demand of learners changes rapidly: The younger generation needs a learning environment for personalization, creativity and associated with digital technology. If Vietnamese education does not promptly adapt, will create a great gap between training and social requirements.

Thirdly, the process of international integration and human resource competition requires Vietnamese labor to have a global digital capacity and skills. Only by digital transformation, education can prepare human resources to meet this requirement.

Thus, digital transformation in Vietnamese education is now an objective indispensable, both a challenge and an opportunity to improve the quality of training and affirm the national position in the digital era.

Advantages - difficulties - basic challenges when performing numbers in Vietnamese education

Digital transformation in education is becoming an indispensable requirement for Vietnam's development. The application of digital technology not only modernizes the teaching - learning and management process, but also facilitates the quality of human resource training for the country. However, this process is influenced by many factors, including advantages, difficulties and challenges. The basic advantage is about the guidelines and policies: Vietnam has issued many orientation documents, notably Resolution No. 29-NQ/TW (2013) on fundamental and comprehensive renovation of education and training; Decision No. 749/QD-TTg (2020) Approving the national digital transformation program. This is an important legal foundation, creating motivation for educational institutions to boldly apply digital technology. In addition, in terms of technology infrastructure: Vietnam is part of a country with high internet development, the ratio of popular smartphones. This opens the opportunity to deploy online learning forms, Blended Learning and learning management systems (LMS). In terms of human resources and awareness. Teachers and lecturers are increasingly conscious of innovating teaching methods. A part of students and students - especially the younger generation - has good technology skills, is easily adapted to the digital environment. The basic difficulty point is the regional difference: Information technology infrastructure in remote areas is limited, many schools lack stable equipment and internet transmission lines. This causes inequality in digital education access. Another difficulty that we can mention is the number of teachers' capacity: Some teachers have not been proficient in technology, are still afraid to change, leading to not high application efficiency. The training and retraining of digital skills for teachers is not really synchronized. In addition, financial resources in investing in technological infrastructure, management software and network security are limited. Many educational institutions do not have enough budget to maintain and upgrade digital systems. Besides, related to quality issues, some online teaching platforms are still lacking in stability, not meeting pedagogical requirements; Learning data has not been fully standardized and security. Digital transformation in education does not stop at digitizing documents or teaching online, but also facing challenges. That is the comprehensive restructuring of methods, content, management and evaluation. The biggest challenge is how to convert numbers to bring substantive effect, not just form. In addition, ensuring education is an urgent issue: If there is no synchronous solution, students in difficult areas can be "left behind". In addition, the balance between technology and human

values, between online learning and direct interaction, is also a challenge for managers and teachers. Thus, it can be said that digital transformation in Vietnamese education has both favorable conditions and faces many difficulties and challenges. In order to succeed, it is necessary to enter the synchronization of the State, educational institutions, teachers and the whole society to maximize technology potential, and overcome the existing limitations.

The basic strategic solutions associated with Vietnamese reality to overcome difficulties and challenges in digital transformation of education today

Raising awareness and perfecting mechanisms and policies on educational digital transformation

Digital transformation in education requires a strong transformation, starting from changing the thinking and perception of each individual. Therefore, increasing awareness of the importance of digital transformation to school officials is essential. Through this, they can cooperate to build a digital culture in the field of education. Educational institutions need to improve information technology skills for all personnel. This includes: improving the skills of using tools and information security in digitally. For the completion of mechanisms and policies on digital transformation of education, the State needs to build a system of synchronous policies, from national strategies to specific regulations for each level. It is necessary to have mechanisms to encourage socialization, public -private cooperation in technological infrastructure development, as well as data protection and network security mechanisms in the field of education.

Construction of infrastructure and learning ecosystems open and open

Internet infrastructure and equipment must be improved and renewed when conducting digital transformation in education. Education units enhance modern technology connections such as: AI, Big Data, IoT, Blockchain with database to collect information. From there, make predictions and appropriate service tweaks to learners. Now, teachers play an important role in the process of making digital transformation in the field of education. They can apply digital technology to teaching methods, opening up new opportunities to improve the quality of education. Thereby helping students, Vietnamese students develop comprehensively in a modern digitalization world. In addition, the investment in infrastructure should also focus on maintaining stability to ensure high -speed internet connection, smart learning equipment for schools, especially in remote areas. Regarding this relevant content, we love and agree with the associate professor's judgment. PhD. Tran Mai Uoc (Ho Chi Minh City Banking University) - when Associate Professor Mai Uoc said that: the implementation of financial autonomy will be the premise, conditions and opportunities for higher education institutions to improve their activeness, initiative and creativity in the process of operation and development. Also according to Associate Professor. PhD. Tran Mai Uoc, the right to autonomy for higher education institutions shown mainly on three major contents: autonomy in performing tasks, self -employment and financial autonomy. In addition, it is necessary to implement computer support programs, digital equipment for difficult students, similar to the "wave and computer" program that the Government has initiated. In parallel, it is necessary to develop learning management platforms (LMS), digital libraries, national open materials and standardized e-learning lectures. These platforms must be integrated, linked data, ensuring learners can access knowledge anytime, anywhere.

Focus on fostering and developing digital capacity for teachers and managers

This is the "button point" decision. It is necessary to develop a digital skills training program according to national standards for teachers; encourage innovation of teaching methods based on technology; Associate numbers to occupational capacity assessment. It is necessary to develop a regular training and fostering program for teachers at all levels, focusing on core competencies such as: using information technology in teaching, designing digital lectures, managing online classrooms, organizing blended learning (Blended Learning), Personalized Learning (Personalized Learning), and especially the learning data and exploitation skills to adjust the teaching method. These are new abilities, requiring teachers to be accessible not only at the technical level, but also from the number of pedagogical perspectives. There should be policies to encourage and recognize teachers' innovation efforts in applying technology to teaching. Teachers actively design numerical lectures, build open materials, deploy smart classroom models that need to be praised, replicated and have mechanisms to reward and support. Creating an open and creative academic environment, where teachers are tested, shared and learned to digitize each other is essential. For university lecturers, in addition to digital teaching capacity, it is necessary to focus on developing scientific research skills in the digital environment. Proficient in digital research tools, large data analysis, international publishing through open academic platforms ... will contribute to improving the quality of university training and competitiveness of Vietnamese higher education institutions in the context of globalization. Nature, fostering numbers for educational management staff at all levels is also essential in the context of digital social and digital education. These people need to have a digital vision, decision -making skills based on data and ability to organize and run the education system in the digitized environment. The construction of the digital school management system cannot succeed without the managers with innovative thinking, understanding technology and the ability to lead the conversion organization.

Proposing the detailed action program framework for digital transformation in Vietnamese education from 2025 to 2030

Based on the above content and issues, we boldly offer a detailed action program framework for digital transformation in Vietnamese education from 2025 to 2030, sticking to the basic strategic solutions stated and practical implementation orientation.

General objectives 2025 to 2030: Building an open, flexible and safe educational ecosystem; Ensuring equity, improving the quality of learning and administration based on data. By 2030: 100% of educational institutions using LMS minimum school level; 90% of teachers meet digital capacity standards; 100% of junior high school students or higher meet the basic population standard; narrowing 70% of the number of infrastructure between urban - rural areas; Operating the national open material warehouse with ≥250,000 standard resources.

The structure is implemented by the pillar: policies and legal · 2) Infrastructure and equipment · 3) Capacity of the team · 4) The platform and learning materials · 5) Ensuring quality and network security · 6) Fair and integration · 7) Cooperation -

Finance – PPP ·8) Data management and assessment monitoring (M&E).

Conclude

Digital transformation in Vietnamese education is now an indispensable trend, stemming from national development requirements in the period of knowledge economy and global integration. This is a strategy that cannot be delayed, in order to improve the quality of training, develop the number of human resources and affirm the position of Vietnam in the digital age. In fact, Vietnam has had important favorable conditions: clear policy policy, development of telecommunications technology infrastructure, and the ability to access fast technology of the younger generation. However, many difficulties and challenges still exist, including the difference in infrastructure conditions between regions, uneven digital capacity of teachers, financial restrictions, and requirements for data safety and education. Digital transformation in Vietnamese education is not only mandatory but also a strategic opportunity. If implemented effectively, it will open a modern, fair, creative and sustainable education, contributing directly to the development of the country in the new period. In this context, in order for the process of transformation to be effective, it is necessary to have the uniformity of the State, educational institutions, teachers, technology enterprises and the whole society is urgent.

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