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Digital Transformation in Training at Higher Education Institutions, Opportunities and Challenges

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Abstract
The article has clarified research goals with theoretical contents of digital and digital teaching. Assessing the current situation of digital transformation in higher education institutions is still not high. Identify opportunities and challenges in the digital transformation process in training. The results of our research are consistent with many researchers in this field. Digital transformation in education is an inevitable trend when the market has the needs and desires of learners; Most educational institutions have not kept pace with the development of technology, and they face many difficulties in the digital transformation process such as limited resources and insufficient high-quality human resources in educational institutions to access new technologies. Accelerating digital transformation in education will require collaboration among stakeholders such as governments, higher education institutions, instructors, and learners.

Keywords: Digitization, Digital Learning, Higher Education Institutions, Vietnam

1. Introduction

Digital transformation has become an inevitable trend in a developed and modernized world. Digital transformation is receiving special attention and promoting development in the field of education. Digital transformation in the field of education, also known as digital education, is the process of using technology to improve the teaching and learning process. This includes using digital tools (computers, tablets, learning software, internet) to create effective, interactive learning environments. There is no denying the role of digital transformation in the education sector, it has improved the quality of education by developing new and more effective learning methods and helping learners prepare for a future of digital technology development. In the training of digital human resources, the Document of the XIII National Congress stated: "Training people in the direction of ethics, discipline, discipline, sense of civic and social responsibility; have life skills, working skills, foreign languages, information technology, digital technology, creative thinking, and international integration" [13]. Educational institutions, especially higher education, need to transform knowledge-equipped training to develop learners' capacity and quality [14] comprehensively; shift from learning mainly in the classroom to organizing diverse learning forms, paying attention to online teaching and learning, via the Internet, social activities, extracurriculars, scientific research; "School education combines with family education and social education. Next, the Document of the XIII Party Congress also set out the goal of training international human resources. Educational and training institutions, especially higher education, must perfect mechanisms and policies to promote and improve the quality and efficiency of scientific research and technology transfer of educational and training institutions. 'Closely linking education and training with research, implementation and application of new scientific and technological achievements; forming excellent research centers, strong innovation groups' [13]. Striving to 2030, Vietnam's education system will reach an advanced level in the region.

Under the direction of the Party, the direction of the government, and a series of guiding documents, education and training in general and higher education in particular have had many positive changes. Training activities and teaching and learning methods have been significantly changed. Information and digital technologies are applied in the administration of training, teaching, and learning. Although many positive results have been achieved, Vietnam is still one of the developing countries, and investment resources for digital equipment are still limited, making digital transformation activities in training and teaching not high. The goal of this article is to learn about digital and digital teaching; assess the current state of digital

transformation in higher education institutions; and identify opportunities and challenges in the digital transformation process in training.

2. Theoretical basis and research overview

2.1 Digitization

According to Collins Dictionary (n.d.) and research team Matt *et al*. (2015), "Digitization is the process of converting information into a digital (i.e. computer-readable) format" [1]. The result of digitization is "the representation of an object, image, sound, document or signal" [2]. Researcher McQuail (2000) shows that "in modern realities, data is digitized in binary numerical form, which facilitates digital and other operations". However, the author also thinks that digitization can be understood more simply, "digitization simply means converting analog source documents to digital format, or any other number may be used instead" [3]. "Digitalization is of particular importance for data processing, storage and transmission, because it allows all types of information of all formats to be transmitted with the same efficiency and mixed together." Group of authors Mirzagayeva *et al*. (2022); Vial (2019; Warner *et al*. (2019) unanimously state that "Digital transformation is the process by which an organization adopts and implements digital technology in order to create new or modify existing products, services, and operations by translating business processes into a digital format" [2, 4, 5]. Aleksej ét al. (2018) argues that "The adoption of digital technology can benefit businesses" [6]. However, McConnell (2015) argues that "some company cultures may struggle with the changes required by digital transformation" [7]. The 2021 European Investment Bank survey found that "55% of European companies said the COVID-19 pandemic has increased demand for digital technology, and 46% of companies reported that they have become more digital" [8].

2.2 Digital Learning

Technological advances and the invention of the Internet in the late 20th century created the prospect of incorporating technology into learning. The early 1900s saw the use of Projectors as an educational tool as well as online classes accessible via radio. Research by F., Sharp, and Vicki (2009) gives information about "two researchers John Kemeny and Thomas Kurtz designed a new computer language, called, easier to learn than previous and popular languagesTimesharing feature, allowing multiple students to use computers at the same time in 1964" [9]. Schools became interested in computers around the end of the 19th century when the presence of computers became more common [10]. Combined with the popularity of computers, the network was also born and developed, it created the connection and connection system that made computers more and more interested in educational institutions [11]. Bates (2015) argues that World Wide Web was invented later (around 1992) to make navigating the Internet easier so that "computers began to be integrated into school curricula"; At first, computers played the role of "word processing, spreadsheet creation, and data organization", later "it became a research tool, used as a library resource" [11]. In the 21st century, many digital tools created from digital platforms have made education and teaching easier, as YouTube 2005 was allowed to distribute educational content and it was uploaded to be used as a teaching aid; iTunesU support for collecting and sharing educational materials and videos; Learning management systems such as Blackboard and Canvas with open to anyone. For example, Canvas provides presentations, and articles made by experts. As such, digital learning offers many positive outcomes, including opportunities for learners to learn at their own pace.

2.3 Higher education

According to the provisions of Article 7 "higher education institutions have legal status, including universities, universities and higher education institutions with other names following the provisions of law. National and regional universities are universities that carry out national strategic tasks, and regional development tasks of the country [12]. Clause 2, Article 7 of the Law on Higher Education 2012 (amended in 2018) stipulates that types of higher education institutions include: Public higher education institutions invested by the State, ensuring operation conditions and acting as the owner's representative; Private higher education institutions invested by domestic or foreign investors, ensuring operation conditions. Private not-for-profit higher education institution means a higher education institution that the investor commits to operating not-for-profit, recognized in the decision allowing the establishment or the decision to change the type of higher education institution; operating not for profit, without withdrawing capital, without receiving income; distribution of accumulated annual profits under undivided consolidated common ownership to continue investing in the development of higher education institutions. Conversion of private higher education institutions to private not-for-profit higher education institutions only [12]. According to Article 6 of the Law on Higher Education 2012, the qualifications and training forms of higher education are stipulated as follows: The training levels of higher education include undergraduate degrees, master's degrees, and doctoral degrees; Forms of training for granting diplomas of higher education training levels include formal, work-study, distance learning. The transition between forms of training is carried out according to the principle of interconnection; Higher education institutions may organize continuing education activities, provide short-term training and retraining services for certificates and certificates suitable to the branches and training fields of each institution following the provisions of law to meet the lifelong learning needs of learners" [12].

2.4 Overview

Research by Elena (2017) in the context of bringing teaching practices into digital and the modernization of higher education institutions. The paper was published in the International Multidisciplinary Scientific GeoConference. The author said that digital transformation is changing entire business models. It requires more skills for human resources such as technical competence and learning methods. Elena (2017) assessed that digital transformation in education or more specifically, bringing technical technology into practical teaching activities is completely suitable in the current situation of digital economy development. Digital workforce training will help learners increase their chances of taking up jobs in the future. The author's research was carried out in the European region and several universities. The study aims to examine the conditions under which higher education institutions embed digital instruction in practice. The author proposed a conceptual model that

integrates teaching practices into digital and strategies for modernizing higher education institutions. Teaching integrates best practices and maintains the environment necessary for governance and monitoring of education quality [15].

Research by the authors Telukdarie & Munsamy (2019) has identified two factors, namely the fourth industrial revolution and the digitization of industry, which have driven the business market to develop. Businesses have quickly approached the digital economy and caught up with the development of technology. Education activities are not out of this wave, training at educational institutions gradually implementing digital transformation. "Universities and higher education institutions have evolved into hubs for technology, developing and delivering skills for the future," he said. However, digital transformation in the education sector is much slower than in the economic sector. "Operations and systems along with delivery processes at a higher education institution need to be modified to provide 4IR savvy services and products, more importantly, systems and processes must support 4IRs to deliver intelligent digital experiences, efficient, seamless." The author's research objective in this study was to evaluate digital transformation activities at the university. The author has "adopted the functional and architectural perspective of the system and its systems. The digital education assessment model is proposed to evaluate traditional and digitized activities, to identify digital technologies to adopt. It is demonstrated by a comparative analysis of traditional and virtual classrooms" [16].

Authors Kopp *et al*. (2019) argue that "digital transformation" has been impacting universities for some time. Many universities are now "developing strategies but few truly understand how to address digitalization." On the other hand, this is because the term "digitization" is rarely uniformly defined. However, digital transformation is often accompanied by misconceptions about its effectiveness. The authors list 5 common assumptions in the context of digitalization that are seen as hindering rather than contributing to the success of digital transformation in universities. These assumptions are: "(1) We need to solve the problem of digital transformation now because everyone is ahead of us (speed); (2) As a traditional university, digitization affects us only slightly (changes); (3) The information technology department is primarily responsible for digital transfer (technology priority); (4) There is an insurmountable gap between digitally competent learners and technologically inexperienced teachers (competencies); (5) The cost of digitization exceeds our (financial) budget." The authors considered "why these assumptions exist" and the "(negative) effects" they might have. They then make "counterarguments, explain why the assumptions are (at least partially) incorrect" and point out which conditions are conducive to digital transformation at higher education institutions. The aim of the authors is to "refute common (but wrong) assumptions in the field of digitalization and counter these assumptions with examples of supporting measures for successful digital transformation of universities." This will be done through a literature review and good practice examples collected by authors in their respective scientific communities [17].

Benavides *et al*. (2020). "Higher education institutions have been affected by the technological advancement brought about by the Industrial Revolution 4.0 and forced institutions to face digital transformation in all aspects". Applying digital transformation approaches to the higher education sector is an emerging field that has attracted interest in recent times as it allows "describing the complex relationships between actors in the technology-enabled education sector." The goal of the authors' research is to summarize the distinctive characteristics of "the process of implementing digital transformation that has taken place in universities". The Kitchenham protocol was implemented by the authors to "answer research questions" and selection criteria for obtaining eligible papers. Nineteen papers between 1980 and 2019 have been identified by the literature as relevant and therefore analyzed in detail. The lead findings of the authors suggest that "this is indeed an emerging field, with no digital transformation to be found in the proposals of universities to be developed in a holistic way". This situation requires universities to intensify their digital transformation and "face the current demands imposed by the fourth industrial revolution" [18].

The research team Kaputa *et al*. (2022) assessed: "Universities undergoing digital transformation have an opportunity to make education more accessible to people from different walks of life." Digital technology provides universities with the tools and skills needed to address today's global issues such as "poverty, quality of healthcare, income inequality, environmental crisis" from a cross-cutting perspective. "The development of digitalization in higher education was significantly accelerated by the outbreak of the pandemic in early 2020. The unprecedented rapid and large-scale transition to online education with widespread support for digital technology." The objective of the study is to reflect the impact of the change in educational activity by the development of technology. The study results show that "digital transformation improves some of the most sought-after skills in the new knowledge society: information retrieval and processing, digital communication and socialization, or text manipulation. It plays an important role in reducing costs associated with education, but it also reduces face-to-face communication" [19].

The study by the authors Teixeira *et al*. (2021) aims to understand how digital transformation at higher education institutions is happening. The authors argue that "the business world has changed dramatically due to the rapid development of technological innovation" in recent times. The article emphasized the significance of digital technology and the catch-up with changing technology that has helped businesses improve in quality, and quantity and find more value in business. Digital transformation has contributed to society and the environment and brought about cultural and social changes. Technology development makes the demand for digital human resources of companies increase. Therefore, it creates a need to train talent with digital skills and "higher education institutions are forced to change their teaching methods to meet the new needs of the labor market". The results help the authors "examine the positive impact of universities on digital development." In addition to identifying the driving forces behind companies to implement digital transformation initiatives, the authors also identify the "skills needed to meet labor market needs and universities' efforts to keep pace with society's digital developments" [20].

Thus, in the trend of the digital economy developing, training, teaching and learning activities at educational institutions especially higher education institutions need to

quickly change and adapt. The school's training products are new human resources that complement the economy. What will be their work results when in the learning process they do not have access to digital technologies, but the working environment requires proficiency in this? The content of digital transformation in higher education institutions is of interest to many researchers. They all share the same opinion: Digital transformation in education is an inevitable trend when the market has the needs and desires of learners; Most educational institutions have not kept pace with the development of technology, and they face many difficulties in the digital transformation process such as limited resources and insufficient high-quality human resources in educational institutions to access new technologies. Therefore, we research the content of digital transformation in training at educational institutions is very necessary and meaningful in terms of practice.

3. Method

The article uses two research methods: the summative analysis method and the historical method.

With the summative analysis method, the author searched for studies with related content with two keywords: "Digital transformation" and "Higher education institution". Relevant studies such as outstanding, well-published, and non-disputed research are used by the author to build a research overview. In the research overview, we present the important observations and assessments of the author of the article, then point out the research results on digital transformation in higher education institutions. The study review also helped us draw many of the same assumptions and the importance of doing this study.

With the historical method, we have explored the formation and development of digitalization, and the process of digital transformation to approach educational activities. The data used in this research methodology have also been sought us from mainstream sources. These documents presented the history of the development of digital teaching, its effects, and implications. From the results of the historical method, digital transformation in training will bring many benefits to the education system and digital transformation is an inevitable trend of society.

4. Results

4.1 Current situation

As we have shown, digital transformation is the process of applying digitalization in training and teaching in the educational environment. The advantage of digital media in training and teaching activities is that it can enhance learner interaction. It also helps learners solve difficult concepts by looking at a variety of sources. Guidance from digital data can also help shed light on confusing topics. When learners use digital technology in their learning, they will have the opportunity to improve their digital skills. The essential importance of digital media in education is that it provides opportunities for all stakeholders in training to interact with each other. Common applications of digital transformation in the field of training are the application of technology to change teaching methods; the application of technology in the management of educational institutions; Apply technology in classroom practice. The digital transformation of the education sector requires a robust, integrated technology platform on a national scale to enable everyone interested in education and training to participate. To achieve optimal results, digital resources and scientific literature must also be integrated into a unified technology platform. Talent is a top priority in the digital transformation of the education sector.

Technology is widely applied in education in Vietnam, many new teaching methods are introduced, combined with the installation of projectors and electronic blackboards in classrooms. Many schools also take advantage of online teaching methods to help learners develop flexible teaching methods that are suitable for many subjects. At many university-level educational institutions, schools or research institutes, teaching staff are fully proactive in capturing information to improve the quality of training, in line with the needs of the social market.

4.2 Opportunities

Accelerating digital transformation in educational and training institutions will help lecturers and learners "Enhance interactivity and practical experience".

Digital transformation in the education sector is helping to create a more flexible learning environment. Learners can access learning materials anytime, anywhere, regardless of time and place.

Digital transformation can help higher education institutions and lecturers make the most of digital technologies to improve the quality of education and enhance teaching effectiveness.

Meet the needs of learners when they not only want to acquire knowledge but also want to "experience, explore and create". Technology has opened up for learners a new, flexible and relevant learning space in line with the trends of the times.

Strengthen the management and organization of training, teaching and learner activities. Digital technologies such as "learner management software, financial management software, and other management tools" can help schools manage resources and information more effectively.

4.3 Challenges

The first challenge is the lack of digital human resources in higher education institutions. The human resources assigned to acquire technical technology at higher education institutions are usually the information technology department. Other instructors have not actively participated and improved their technology level. Digital transformation awareness of some administrators, lecturers and learners is limited. Most of them are still unaware of the importance of using technology in teaching, learning and research. This limitation causes many obstacles to the implementation of digital transformation in education.

The second challenge in the digital transformation of higher education institutions is the lack of digital resources. The digital transformation of higher education institutions requires a robust, integrated technology platform that can serve the teaching, learning and research needs of lecturers, learners and interested people in society. This requirement raises the problem that educational institutions need a huge number of financial resources and technology personnel. Information technology and telecommunications infrastructure systems at many higher education institutions have not met the requirements of digital transformation, lack of technological equipment, and unstable internet are the reality in many higher education institutions today.

The third challenge is the safety and security challenge. Educational data is sensitive and must be stored securely. Protecting learner's and instructors' data from potential online risks is a major challenge in the digital transformation process.

5. Conclusions

The digital transformation of education is a difficult, complex process. Accelerating digital transformation in education will require collaboration among stakeholders such as governments, higher education institutions, instructors and learners. The government needs to put in place policies, mechanisms, and guidelines to support and facilitate the digital transformation in education. These policies should focus on creating a regulatory environment, investing in infrastructure and technology, and developing and promoting digital human resources. Educational institutions need to actively innovate, develop and apply information technology, develop plans for the digital transformation of education, invest in infrastructure and technology, and train and disseminate digital technology to lecturers. Finally, teachers and learners need to be trained and supported to meet the requirements of digital transformation in the education sector. Educational institutions should organize training programs to equip teachers and learners with basic knowledge and skills in information and communication technology.

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