

## **Digital Education to improve the Quality of Human Resources Implementing Digital Transformation in the Context of Industrial Revolution 4.0**

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### **Abstract**

*Digital economy has become a new direction with lots of potentials for the world economy as well as Vietnam. Digital transformation is the process in which people change the way people live, work, and produce with digital technologies. To do that, it is necessary to make a change in both management methods and practical teaching in universities. That is, universities must apply modern information technology to meet the increasing learning needs of students and faculty, creating a learning environment where everything is connected. This is an ecosystem that combines technology, services and security to bridge the digital divide. That will create collaborative, interactive, and personalized learning experiences. Digital transformation is the transition from a traditional way of living, working to a way of living and working with both digital versions of entities and their connections in digital spaces. The study aims to analyze the need for the formation of a digital economy training field to create high-quality human resources to operate in the digital economy environment. Research uses a combination of qualitative research methods and quantitative research. In particular, qualitative research using in-depth interview method for experts including leaders, managers at universities, business managers. The aim is to explore the influencing aspects of the industrial revolution 4.0 on the human resource training process to respond to businesses in the digital transformation landscape. Next, quantitative studies are carried out to analyze and evaluate the relationship between training process and labor supply for enterprises in order to adapt to the digital transformation context. The article also gives comments and recommendations on solutions to innovate training activities to adapt to the digital transformation trend.*

**Key-words:** Digital Transformation, Digital Economy, Digital Education, Industrial Revolution 4.0, Digital Enterprise.

**JEL Classification:** M510, M53, M13, M14

## 1. Introduction

### Overview of Theories and Related Studies on Promoting the Development of Digital Education in the Context of Digital Transformation in Enterprises

Human resources are considered a basic factor of the productive force. Therefore, for each different stage of development, society will need human resources with different levels of awareness and skills. The emergence of Industrial Revolution 4.0, with one of the three main pillars being Digital, the trend of replacing machines for machines is presenting businesses with many new development opportunities. The traditional business model through the application of word of mouth marketing solutions is no longer suitable. So besides opportunities, great challenges are always attached. Enterprises that want to survive must take advantage of new technology platforms - digital technologies to create high added value. To operate this technology platform, businesses need to meet the demand for high quality human resources. Such human resources must have core values obtained from the training process, must meet not only professional qualifications but also require skills, expertise, and ability to adapt to change. and development of technology. Recognizing the importance of high demand for human resources, the Vietnamese government has been actively implementing action programs to build and strengthen the national education innovation system towards the goal of change number. Viotti's study (2002) has addressed the issue of the appropriateness of the concept of 'educational innovation system' in developing countries, where 'learning' seems to be more important than 'new innovation' in developed countries. This also means that the concept of "learning" always takes place at the heart of the "national innovation system" (Lunvall, 1992). Edquist (1997) also pointed out that "learning" is one of the important characteristics of the "National Innovation System" approach to create high quality human resources, adapting to new development trends. In another study by Geisler & Rubenstein (1989) has also shown that university-enterprise coordination covers different levels, from developing digital businesses to providing high-quality human resources capable of operating well the digital technology platform. Or the formation of creative research centers in enterprises so that learners have the opportunity to practice and experiment with new advances in technology. According to Swanson, R.A. (2001), the development of digital human resources is the process of developing and facilitating the liberation and promotion of human abilities through organizational development, personal training and development with the aim of improving ability to adapt to the digital transformation trend. Currently, in developed countries, businesses often order universities to conduct research, which prioritizes research with the application of Big Data or cloud computing technologies. Universities are now research oriented and the transfer of research

results to enterprises (Lee, 2000). Therefore, universities need to direct their teaching and research activities to enterprises to better exploit and test research results. Businesses also need to have connections and support universities in both resources and "orders" to develop research and creative topics. Currently, in universities and enterprises, the increase in cooperation and connection tends to increase because they are all aware of the benefits of cooperation (Mora-Valentin, 2000).

## **2. Methodology**

This study mainly use qualitative analysis including synthesis, analytical and explanatory methods.

We also use historical and dialectical materialism methods.

## **3. Main Results**

### **3.1. The Objective Need of Digital Education Development to Meet High Quality Human Resources for Digital Enterprise Development**

#### **The Need for High-quality Human Resources to Meet Vietnam's Socio-economic Development Goals**

Directive No. 52 (52-NQ / TW) signed by Secretary General Nguyen Phu Trong on September 27, 2019 outlines a number of guidelines and policies to actively participate in the Fourth Industrial Revolution. In which, emphasizing the international integration task, actively participating in the Fourth Industrial Revolution is an objective indispensable requirement. This is a mission of important strategic significance, both urgent and long-term for both the political system and the entire society. But at present, the quality of human resources has not met the requirements of the development. Science - technology, innovation are not really the driving force for socio-economic development. On the other hand, the process of transforming the number of countries is slow, and the digital economy is still small. Therefore, Vietnam must be determined to renew its thoughts and actions, in which educational innovation is seen as an opportunity for Vietnam to make a breakthrough to implement the digital transformation revolution.

Directive No. 01 / CT-TTg issued on January 14, 2020 on promoting the development of digital technology enterprises in Vietnam also emphasizes our country's determination to implement digital transformation. According to the model of some countries with developed economies based on digital technology enterprises, by 2030, Vietnam needs at least 100,000 digital technology enterprises

to develop digital economy. But in order to operate these digital businesses, it is necessary to have people - human resources trained on digital education, with basic knowledge of digital economy. Vietnam has set a goal by 2045 to become a developed country. Accordingly, GDP per capita in 2030 will at least reach 18,000 USD (at PPP prices in 2011). Research from Oxford University (USA) has also shown that 50% of jobs in developed countries will be replaced by automated processes in the next 15 years. And this rate for a developing country like Vietnam will definitely be higher. However, with current strength and determination, Vietnam can completely become the "dragon, tiger" of Asia and the world in the 21st century if it knows how to take advantage of the opportunities and overcome the challenges of industrial revolution 4.0. The key here is that we must have high quality human resources and develop core technologies and new forms of business. So, the key issue comes back to value in the end, which is the story of building a human development strategy.

### **3.2. The Context of the COVID-19 Pandemic has Helped Vietnam Turn Challenges into Opportunities to Realize Digital Transformation in Education**

The COVID-19 pandemic, which has lasted for more than a year, has created pressure on universities for forced change. Schools cannot stop teaching for a long time. That pressure has turned into motivation for us to undertake various types of distance training, online training and digital transformation. Through the first epidemic, by April 2020, Vietnam had 110/240 higher education institutions that had deployed online training. Originally online training was initially considered a temporary solution, but until now, online training has become the trend of the times. Therefore, the COVID-19 pandemic has created an opportunity to promote digital transformation in education. Currently, in many universities, teachers maintain parallel teaching: both creating assignments and creating learning materials in the classroom, while conducting instruction in the classroom.

### **3.3. The Trend of Choosing a Career of Young People Today**

Often young people like to explore and discover new things, career opportunities and choose new careers. Perhaps, Economy and Technology is one of the practical directions chosen by many young people in the era of industrial revolution 4.0. Therefore, some long-standing industries that were still considered a hot trend such as agriculture and forestry, or management codes will no longer be appropriate. Perhaps we have to accept the fact that the enrollment is low, not even the quota. Therefore, perhaps if the shirt is too old, we should also find ways to buy a new one, replace it, not try to be entrenched and then be disappointed because we have to expect but not achieve. Moreover,

digital economy and digital business currently do not have many training facilities. So we imagine, this cake we are the first kneaders. So it may not be good at first, but because the name is suitable for the development trend will be an attractive and attractive to the society for them to find and choose universities with digital economics majors.

### **3.4. Development Orientation at Universities in the World and in Vietnam Today**

In terms of science, the plan is considered a specific action plan, and planning is the process of organizing the preparation and implementation of specific plans that have been proposed. Planning is a process in which an administrator identifies and selects an organization's goals and outlines the actions needed to a Training short courses or graduate programs in digital economics and digital transformation for businesses are available at leading universities in the world such as MIT (USA), Monash (Australia), King's College London (United Kingdom), University of Toulouse 1 (France), ...

In particular, the bachelor training in the field of digital economics or digital business at some schools such as:

RMIT University (Australia): training bachelor of digital business (Bachelor of Digital Business), study for 3 years with program structure and subjects can be found at RMIT website.

NORD University (Norway): training bachelor program in digital economics and management (Bachelor of Digital Economy and Organization) with a training period of 180 credits in 4 academic years.

Bangkok University of Technology (Thailand): training bachelor program in information science in digital economy with a study period of 4 years, corresponding to 8 semesters.

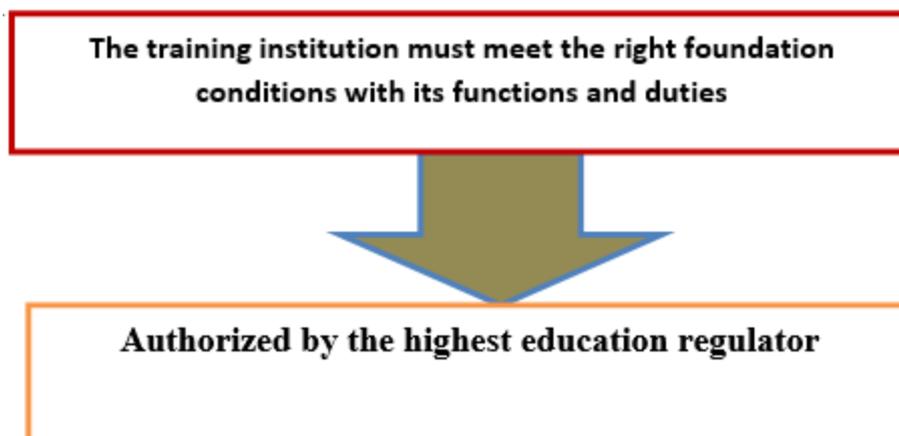
University of Brunei (Brunei Darussalam): training bachelor program in digital economics (BSc in Digital Economy) with a study period of 4 years, 2 semesters per year.

International University Berlin (Germany): training bachelor program in management and digital business (Bachelor of Digital Business and Management), study for 4 years with 8 semesters.

In Vietnam, National Economics University: is the pioneer school to train digital business bachelor in English. The training program of the National Economics University is designed with 139 credits with 8 semesters.

### 3.5. Design Principles and Conditions for Opening Digital Economics in Vietnamese Universities

Figure 1 - Principle Model Guarantees the Opening of the Digital Economy



Source: Author's proposal

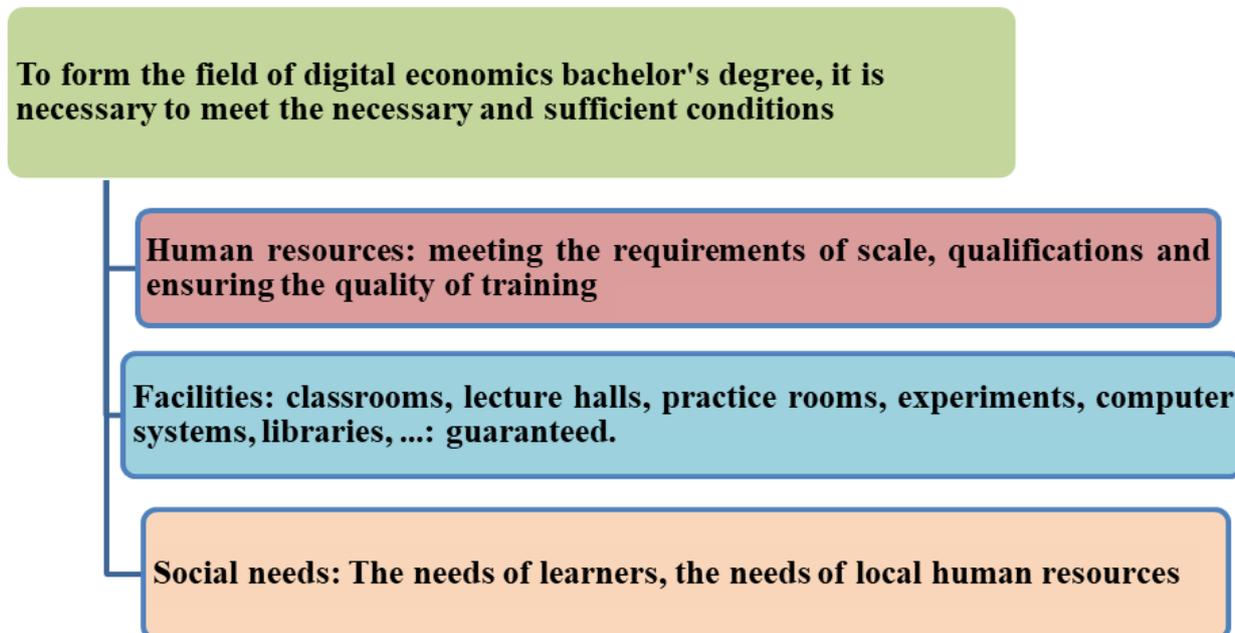
Research to select a case study at a Vietnamese university. The University of Information Technology and Communication is a member of Thai Nguyen University, established by Decision No. 468 / QĐ - TTg dated March 30, 2011 of the Prime Minister. University of Information Technology and Communication has the functions and duties of training human resources in Information Technology, Communication Technology, Automatic Control Technology, Management Information Systems, Office Administration and E-commerce has a high level of expertise, serving the industrialization and modernization of the northern midland and mountainous provinces, contributing to the socio-economic development of the region and country. Over the past years, the University of Information Technology and Communication has constantly grown, expanding its size, type and profession of training. Every year, the school opens training classes for thousands of scientific and technical staff in the midland and mountainous areas, the North and other localities.

In the context of revolutionary scientific changes, a breakthrough of digital technology has led to a development trend and requires drastic changes in the structure, economic and social model of the country as well as the system. management of branches and fields, including educational activities. Recognizing the importance of training digital human resources in the socio-economic development of the country, Vietnam soon had policies and guidelines to facilitate and promote training activities towards applying digital technology such as: requirements for technological innovation, promoting scientific analysis and management, large data processing to create new knowledge, support for quick, accurate, effective decision making. results in educational activities.

Directive 24 / CT-TTg dated May 28, 2020 of the Prime Minister has become a guideline for promoting the development of skilled human resources, contributing to improving labor productivity and enhancing competitiveness. national painting in new situation.

### 3.6. Proposing Conditions to Realize the Opening of a Digital Economy Training Profession

Figure 2 - Conditions for Digital Economy Training

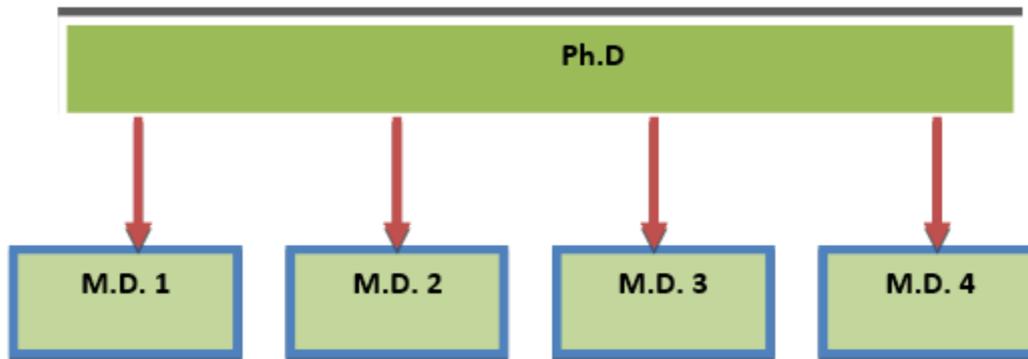


Source: Author's proposal

The lecturers of the Faculty of Economic Information Systems have basically met the requirements of training scale and quality. The Faculty of Economic Information Systems has 38 organic faculty members who will directly teach the industry. In the course of training, scientific research and technology deployment and application, the University and Faculty have cooperated with the Institute of Information Technology under the Vietnam Academy of Science and Technology. To expand cooperation relationships with many domestic and foreign university training institutions such as: National Economics University, Ho Chi Minh City University of Economics, Department of E-Commerce and Digital Economy - Ministry of Industry and Trade, University of Commerce Financial Academy, Foreign Trade University, ... to have more qualified and reputable scientific staff in E-Commerce, Management Information Systems, Office Administration, to coordinate with teach and guide the internships and graduate thesis guidance.

## Option 1

Figure 3 - Number of Lecturers Meeting the Training of Digital Economics



Source: Author's proposal

To train in digital economics, it is necessary to have at least 10 organic lecturers with a master's degree or higher in the same or near digital economics discipline. Including at least 1 Ph.D and 2 masters graduated in digital economics.

## Option 2:

Figure 4 - Number of Lecturers Meeting the Training of Digital Economics



Source: Author's proposal

To train in digital economics, it is necessary to have at least 10 organic lecturers with a master's degree or higher in the same or near digital economics discipline. Including at least 2 PhDs and 2 masters graduated in digital economics.

The lecturers of the Faculty of Economic Information Systems have basically met the requirements of training scale and quality. The Faculty of Economic Information Systems has 38 organic faculty members who will be directly involved in teaching digital economics. In the course of

training, scientific research and technology deployment and application, the University and Faculty have cooperated with the Institute of Information Technology under the Vietnam Academy of Science and Technology. To expand cooperation relationships with many domestic and foreign university training institutions such as: National Economics University, Ho Chi Minh City University of Economics, Department of E-commerce and Digital Economy - Ministry of Industry and Trade, College of Commerce, Academy of Finance, University of Foreign Trade, ... for more Many qualified and prestigious scientific staff in E-Commerce, Management Information Systems, Office Administration, coordinate to teach, guide internships and graduate thesis guidance.

Under both of these options, the faculty of the Faculty of Economic Information Systems of the University of Information Technology and Communication responded. In recent years, the faculty of the Faculty, especially the Dean of the Faculty, has attended many seminars on digital transformation, digital transformation, and support in developing the digital economy such as:

On October 27, 2020, participated in the National Science Conference at the Institute of Information Technology and Digital Economy - National Economics University with the topic "Digital Economy: Theoretical and Practical Issues"

Has deployed cooperation, exchange, technology transfer, scientific research, teaching and research orientation with the Faculty of Business Information Technology - University of Economics Ho Chi Minh City.

On September 30, 2020, 1C VIETNAM's expert group had a meeting with the Department of Economic Information and Communication on providing 1C's solutions that have been trusted by more than 3000 customers in daily work and network. 1C VIETNAM's partner network spans all over Vietnam.

On December 7, 2020, the Faculty of Economic Information Systems - University of Information Technology and Communication cooperated with the Center for E-commerce Development - Department of E-Commerce and Architects to hold a scientific conference "Digital brand and user behavior in the digital environment".

On December 18: Attend a seminar at Ho Chi Minh City University of Education with the topic of developing information systems in business and management.

In addition, lecturers in the Faculty also have many scientific researches, articles in prestigious journals about the development orientation of the digital economy.

Currently, the Faculty of Economic Information System has developed the code of E-commerce and digital marketing with an advanced training program, in line with the social reality and meeting the output standards of agencies and businesses. In particular, the Faculty of Technical

Information Technology has strengths in both fields: it is both acquired on the basis of technology and exploited in depth in economic profession. Moreover, the current code of Faculty is E-commerce and Management Information System, which is interdisciplinary: both IT and economics, so opening new industry codes towards Digital Economy will both inherit and exploiting and taking advantage of existing resources, in accordance with the needs of the society.

The school has a total planned area of 86,000 m<sup>2</sup>, of which area for use is 86,000 m<sup>2</sup>. The total construction floor area is 39336 m<sup>2</sup>. Including lecture hall area (classrooms, computer practice rooms, libraries), working house area, dormitory, sports field system, student square. In addition, the University is a member of Thai Nguyen University, so it is allowed to use the general works of the University such as: Learning materials center, multi-purpose gym, canteen... Therefore, our University is sufficient for training, scientific research and other professional work.

University computer room system for practice and high-quality classrooms. Computers and equipment are mostly new and modern. The total number of our practice rooms is 21, with 342 computers connected to the internet. The equipment is purchased to meet the learning and teaching and scientific research requirements of learners and lecturers.

All university classrooms are fully equipped with podiums, tables and chairs, lighting systems, fans, projectors for teaching and research. All classrooms in the lecture halls serving direct teaching activities are fixed with projectors. The practice rooms are fully air-conditioned, with computers connected to LAN and internet.

#### **4. Discussion**

##### **Proposing Solutions to Develop the Field of Digital Economy Training**

The outstanding development of IoT, Big Data, AI, SMAC (social network - mobile - big data analysis - cloud computing) is forming digital education infrastructure. Therefore, changing the training method of teachers, the way of learners in vocational education institutions from the traditional environment to the digital environment is a necessary job in the current trend. The process of social movement when converting digital will generate many new professions and new fields. This is a new potential but also challenging market for vocational education activities. To realize it, it is necessary to promote online public services to serve the people; thoroughly digitizing, using electronic documents, electronic score book records to replace paper, paper documents; Activities of direction, administration, transactions, meetings and training are mainly carried out in the network

environment. Therefore, digital transformation in vocational education must be done quickly, surely, systematically and inheritably. In order to adapt and integrate with the general trend of humanity, it is necessary to focus on implementing the improvement of the Vietnam Human Resource Composition Index (HCI) according to the United Nations e-government assessment method. In the teaching process, it is necessary to promote education on national digital transformation, especially basic skills, knowledge, creative thinking, ability to adapt to the requirements of the Industrial Revolution. It is necessary to promote the development of digital data (for teaching - learning, testing, evaluation, reference, and scientific research) at all levels, disciplines and subjects associated with content evaluation, and connecting and sharing learning materials between localities and universities. To form a digital repository of shared, open learning materials linked to the world to meet the needs of self-study and lifelong learning, narrowing the gap between regions. Implement innovation of teaching and learning methods based on the application of digital technology, encourage and support the application of new educational and training models based on digital platforms. Invest in fundamental technology infrastructure for education. Create a digital environment that connects and shares between educational authorities, schools, families, and teachers. Universities need to develop open online courses, forming an open learning network of Vietnamese people to create a common platform.

## **5. Conclusion**

In the context of Industry 4.0, the biggest opportunities are not taken from the available things but the opportunities that we take and create it. Therefore, the resource economy no longer maintains its value, but the digital economy has gradually become a development trend in the current era. Vietnamese universities need to develop human development strategies and strongly innovate education to equip knowledge, promote creative capacities, skills and visions for learners in this digital age. Especially, higher education institutions in the economic sector require urgent renewal of training programs, contents and methods in order to catch up with the trend of university training development in the world. Therefore, opening a training in Digital Economy will be an inevitable trend for Vietnamese universities to integrate and reach out further in the development process.

Trung Hieu Le, Nguyen Thuy Dung, Dinh Tran Ngoc Huy et al (2021) stated important roles of Internet of things IoTs in our life, work, education and industries.

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