Development of training in the context of Covid-19 pandemic and development of the digital economy

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ABSTRACT

Developing training programs to meet the labor needs of enterprises in order to improve the quality of human resources in the digital economy is urgent because human resources are one of the factors constituting the success of enterprises. The purpose of our research is to analyze the need to develop training programs towards improving the quality of learners to meet the labor demand in enterprises in the digital economy. The research methods used for the article include: document analysis, comparison, survey and experimental data analysis. The obtained survey results were processed by the author by quantitative analysis techniques on SPSS software. The results of the survey helped the author identify the needs of developing training programs in universities in Vietnam today. The main results of the study provide solutions for determining the orientations for developing training programs at universities in Vietnam to keep up with the development of the digital economy.

Keywords: Digital economy, digital citizenship, training programs, job demand, digital businesses.

INTRODUCTION

The emergence of the 4th industrial revolution has led to the trend of digitization or digital transformation. Digital transformation appears strongly in all areas of social life, because the "core" of the 4th industrial revolution is digital transformation. Digital transformation with the integration of digitization, hyper-connectivity and intelligent data processing has had a strong impact on economic development. With a population of nearly 100 million people, Vietnam is considered one of the countries with a relatively high digital economy development rate in the ASEAN region. The Vietnamese government also has strong orientations and efforts in action to promote the development of the digital economy. For successful digital transformation, it is important to develop a moving education industry with the context of digital transformation. To promote the development of the digital economy, organizations and businesses need to be supported with digital transformation solutions. Organizations and businesses need to train digital human resources as the core to actively participate in the digital economy development process. For successful digital transformation, each business needs to choose a suitable model and have high-quality human resources. (Weinelt & Moavenzadeh, 2017).

Small and Medium Enterprises (SMEs) are enhancing their digital transformation strategies with innovative new values in technology. At the same time, businesses are also focusing on creating business models and reorganizing business processes to adapt to the ever-changing digital economy. In line with the changes in the business environment based on the ecosystem of digital platforms, enterprises are working to enhance the corporate digital platforms. Human resource training is also promoted to improve the level and ability to operate digital technology platforms in enterprises (Tuan et al., 2006).

Therefore, in order to be able to operate modern technology lines, enterprises must be able to recruit highly qualified workers and be trained in basic technology knowledge. Awareness and technology operation skills of human resources trained at universities are key factors for the success of enterprises (Carter & Yeo, 2017). Only this human resource is capable of operating businesses that operate in the digital environment (Sun & Bo, 2021). Everything that can be digitized will be digitized and anything that can be connected to a network will be connected to a network. This includes both people and computers, as well as products and services. But the most core issue is still people trained in digital transformation (Ahmad, Kurdi & Aburayya, 2021; Korkmaz & Mirici, 2021).

In the context of extremely strong digital transformation, Higher Education institutions have also made changes to the interaction between students and faculty; teaching. Therefore, training programs have been improved to suit the evolving realities of enterprises (Garcez1, Silva & Franco, 2021). The issue of adjusting training programs to create human resources to meet job positions at enterprises has attracted the attention of universities. This comes from many factors, but the most basic one is still to meet and satisfy the interests of the parties involved (Geisler & Rubenstein, 1989). Universities have focused on inviting businesses to teach at the

university. This is to create opportunities for universities to improve the capacity of lecturers, increase revenue to reinvest in university activities. This also helps to create opportunities for students to access work in progress at enterprises. This is also important work that should be done to help improve governance at universities (Koschatzky & Stahlecker, 2010). However, the inclusion of enterprise teaching contents in training curricula has not been developed and is not properly understood by universities (Howells, 1986).

Etzkowitz (1993), Etzkowitz & Leydesdorff (1995) proposed to form the relationship between universities - enterprises and the State in the knowledge society to create high quality labor resources for the society. This model aims to create new social formats for the production, transfer and practical application of knowledge. The integration of training activities at universities and businesses also emphasizes the pioneering role of universities in developing training programs so that it is more and more relevant to social realities. Therefore, in order to improve the training program compared to the previous training program, universities can invite businesses to participate in guiding and teaching a number of modules related to reality to equip new knowledge to learners (Nyugen, 2021a). In fact, businesses have also had activities to support universities in training activities, such as: Providing practice equipment, experiments, accepting students for internships, consulting program adjustment training (Pham Thi Thuy Trang et al., 2019). This helps learners gain more technological knowledge and thinking to be able to effectively operate and exploit modern information systems in enterprises. This is the right direction when countries are focusing on investing in the development of digital businesses (Nyugen, 2021b,c).

For Vietnam, developing the digital economy is a great opportunity to close the development gap. Recognizing the importance of the digital economy, universities need to adjust and change their training programs to suit the development trend of society. Universities need to equip learners with the foundational knowledge of technology and awareness of the need to transition to a digital economy so that learners can easily adapt to the digital transformation context.

My research analyzes the need to conduct curriculum development in the digital economy. In order to have human resources involved in operating the digital economy, what necessary conditions must universities meet? The study begins with a review of research literature on human resources responding to the development of digital businesses. Some research methods will be presented in the next section. Next, the research results and discussion are introduced. The conclusion of the paper focuses on some viewpoints and contributions of the study, and orients some solutions for managers and policy makers to refer to.

,MATERIALS AND METHODS

Research design

The author has designed a questionnaire with observed variables to measure the factors affecting the need for online training development at universities. The survey consists of two main parts with the following contents:
- Personal information (name of respondent, working address, title)
- 04 groups of scales of factors affecting the need for online training development at universities using a 5-level Likert scale: 1: Extremely difficult, 2: Very difficult, 3 :Normal , 4: Very favorable , 5: Extremely favorable .

Participants

he sample size must be at least 4 times the number of variables in the factor analysis. In this exercise, there are 4 groups of large variables and 20 small variables, so the sample will be 120 research samples. The survey participants included 120 different research and teaching staff (teaching assistants, lecturers, associate professors, professors) at universities in Hanoi capital and Thai Nguyen province.

The study used simple randomization and multi-stage sampling. In which, 20 questionnaires were sent to administrators at universities and 100 questionnaires were sent to experienced lecturers.

Data collection tools

To collect data for research, the author uses Google Forms. After designing the survey via Google Forms, the author sent it to respondents via e-mail. In addition, the author also conducts interviews with administrators and teachers (basically the topic is related to the issue of using online training). Conduct lectures by experienced instructors through the zoom tool to observe the lecturers teaching during online lessons.

The article uses the following methods: survey of research and teaching staff (a questionnaire with a total of 20 unique choice questions, created in Google Forms and shared among respondents) via e-mail, interviews with administrators and teachers (basically topics related to the use of online training), and observation methods (observation of lecturers during class time) to assess the level of application of online training.

Quality measurement techniques and expert assessment methods are used to determine the influence of factors. All questions are divided into 4 groups. The experts determined the weighted ratio according to the significance level for each group. Each question receives its own weight ratio. According to the response, the average score for each question is calculated on a 5-point scale. For that purpose, each answer is given a corresponding number of points ("Completely dissatisfied" - 1 point, "Not satisfied" " - 2 points, "Confusion" - 3 points, "satisfied" - 4 points, "Completely satisfied" - 5 points). The overall score for the need for online training

development at universities is further calculated according to the principles of the standard measurement, with higher scores indicating the need for further development of form-based training higher online.

Data analysis

All response data will be analyzed and processed with the support of SPSS software version 20. From there to determine the logic and correlation of the observed variables. Next is to give specific results and recommendations about my research paper.

RESULTS OF RESEARCH

Human resources need to be equipped for businesses that Vietnamese higher education needs to train in a time when digital technology plays an important role. To obtain this human resource requires universities to meet the necessary conditions. Those are the fundamental resources needed to serve the training of digital human resources. The survey results are as follows:

Table 1: Allocate respondents by resource groups

Options	Subtotal	Percentage
Digital technology resources	190	86.36%
Digital learning resources	211	95.90%
Networking system and hyperconnected technology	215	97.72%
Smart connected devices	212	96.36%

The first resource for the development of training activities mentioned is digital technology. Digital technology is a necessary resource with a higher level of demand than information technology. Technology revolution 4.0 with the development of artificial intelligence, Internet of things, cloud computing, big data, blockchain. Therefore, the collected information and data are converted into information and electronic data, digitized, stored and transmitted with a larger capacity. The processing of data is also done more, faster than the previous data, so this resource is needed for the development of educational activities. Digital technology with its core components of computer hardware, software, and networks in its structure is transforming society and the economy. This is also a necessary foundation to develop an open education, education on a smart digital platform.

Digital technology has a great impact and influence and at the same time affects almost all industries and fields; connecting, transmitting information, storing, managing and processing information, creating the organization and operation of the whole system, creating the foundation for other technologies to be implemented. Digital technology with artificial intelligence, Internet of things, cloud computing, big database acts as the human brain and nervous system for the whole system. This is a characteristic element of digital technology in the technologies of the Fourth Industrial Revolution.

In Vietnam today, according to the author's survey results, more than 20 million students and nearly 2 million teachers at all levels have to apply online learning due to the impact of the COVID-19 epidemic. The context of the COVID-19 pandemic has forced schools in general and universities in particular to switch to online teaching to adapt to the current context. Online teaching has many advantages but also poses many challenges that the Education and Training industry has been trying to overcome and overcome. The promotion of information technology application, improvement of teaching facilities and equipment; Changing and adjusting teaching activities, organizing online teaching has created opportunities for universities to develop their capacity to use information and communication technology in teaching and learning. This is an opportunity to promote digital transformation in education and training in Vietnam. Online training has helped Vietnamese students study anywhere, anytime, and ensure the prevention and control of epidemics and adaptation to the situation of the COVID-19 epidemic. Therefore, the universities have well implemented the motto "stop going to school, don't stop studying", meeting the goals of training programs and work plans of the school year.

In order to adapt to the context of the epidemic outbreak in Vietnam, universities have built digital data repositories. The author has surveyed at 20 universities in Vietnam. All schools have used interactive software, online documents, video banks to upload and exploit learning resources on the internet through websites, zalo, youtube, facebook. This is a condition for higher education institutions to use or share learning materials among groups of lecturers. In Vietnam, there are currently 150 higher education institutions that have switched from face-to-face teaching to online to prevent epidemics. The online training at Vietnamese universities meets the current regulations on information technology application in the management and organization of online training; combined enhanced online classroom quality management solutions.

To check the reliability of the questionnaire, the author used Cronbach's Alpha analysis using SPSS statistical software.

The reliability of the variables on the adjustment of the training program

Table 2: The reliability of the variables on the adjustment of the training program

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
CTDT1	11.38	2.376	0.601	0.712
CTDT2	11.32	2.401	0.689	0.778
CTDT3	11.15	2.356	0.705	0.743
CTDT4	11.57	2.498	0.589	0.798
CTDT5	11.01	2.367	0.621	0.718
CTDT6	11.42	2.401	0.781	0.768

The results of the correlation between the sum of the variables all have the correlation coefficient of the total variable reaching a value greater than 0.3. So the variables in the training program are usable. Cronbach's Alpha coefficient = 0.781 greater than 0.6 should be accepted for the next analysis step.

The digital economy poses a requirement to solve human resource problems and train high-quality human resources to meet the requirements of the 4th Industrial Revolution. Therefore, universities need to come up with solutions. education and training development strategy. In which, improving the training program to suit the development of society is an objective requirement. This requires universities to switch from equipping knowledge to comprehensively developing learners' competencies and qualities, learning with practice, theory with practice.

The reliability of the variables on the policy of changing the form of online training

Table 3: The reliability of the variables on the policy of changing the form of online training

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
HTDT 1	10.89	3.687	0.686	0.789
HTDT 2	11.23	3.563	0.798	0.801
HTDT 3	11.41	3.655	0.732	0.867
HTDT 4	11.78	3.621	0.778	0.831
HTDT 5	10.20	3.534	0.187	0.562
HTDT 6	11.10	3.398	0.210	0.451

The results of the correlation between the sum of the variables all have the correlation coefficient of the total variable greater than 0.3. Variables HTDT5 and HTDT6 have the total correlation coefficient less than 0.3, so the effect is remove these two observed variables. Cronbach's coefficient Alpha: 0.758 greater than 0.6 should be accepted.

Besides the innovation of the training program is the appearance of new forms of teaching. They are multi-platform, multimedia training models that have a combination of online and online. Training activities will reduce theory, apply technology in training, train training associated with scientific research activities and bring learners to participate in practical work. Learners will practice more in laboratories with modern simulation models, design open educational and training networks, community learning networks... Therefore, universities are not only focus on one form of innovation, but it is necessary to focus on diverse types of innovation in order to maintain core competencies, create differences, uniqueness, and prestige in attracting students and trainees.

Reliability of resource variables for online training

Table 4: Reliability of resource variables for online training

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
NL 1	11.65	4.567	0.733	0.822
NL 2	11.57	4.412	0.756	0.812
NL 3	11.71	4.761	0.776	0.865
NL 4	11.84	4.211	0.712	0.887

Cronbach's Alpha coefficient = 0.832> 0.6, so the observed variables are satisfactory. If the NL1 scale is removed from the research model, the coefficient Cronbach's Alpha = 0.822 < 0.890, proves that the value of NL1 when removed from the model makes the Cronbach's Alpha coefficient decrease. Similar to NL2, NL3, NL4, too, Cronbach's Alpha values are all smaller than the initial Cronbach's Alpha values. So it can be seen that the scales of resource variables for online training are consistent with the research model.

Universities have formed their mission, vision, goals and tactics in strategic development plans. The innovation purpose of higher education and training institutions is to create better value and increase efficiency. Therefore, university administrators need to care and prioritize balancing the five aspects of value creation so that innovation efforts are focused on maximizing organizational performance. In which, emphasis is placed on investing resources for training. Universities need to quickly prepare adequate facilities and equipment for teaching, such as: Classrooms are equipped with high-configuration computers, and equipment such as cameras, voice assistants, etc. headphones,...; put Zoom Meeting software into teaching implementation. To be effective, universities need to focus on improving new training methods. It is necessary to mobilize all lecturers to actively prepare electronic lectures to ensure the requirements set forth in the teaching process such as: Amount of knowledge, time and method of transmitting knowledge to students. Teachers need to assign homework, help students be more active in studying materials, be creative and add more knowledge to lessons in class. Lecturers need to be ready to guide and answer students' questions and concerns about the lesson via email, messenger and zalo while students are reviewing at home to improve teaching effectiveness.

Reliability variables of learners' readiness for online training

Table 5: Reliability variables of learners' readiness for online training

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
DU1	10.92	2.756	0.589	0.787
DU2	10.94	3.465	0.546	0.765
DU3	11.02	3.212	0.612	0.738
DU4	10.82	3.098	0.698	0.712

Cronbach's Alpha coefficient = 0.796> 0.6, so the observed variables are satisfactory. If the DU1 scale is removed from the research model, the Cronbach's Alpha coefficient = 0.787 < 0.796, proves that the value of DU1 when removed from the model makes the Cronbach's Alpha coefficient decrease. Similar to DU2, DU3, DU4, too, Cronbach's Alpha values are all smaller than the initial Cronbach's Alpha values. So it can be seen that the scales of the variables of learners' readiness for online training are consistent with the research model.

The majority of survey results confirm that online learning is familiar with students quite quickly and is very excited. Students are guided by the teacher to install the necessary software on computers and mobile phones to ensure effective class participation. However, the survey comments also emphasize that universities need to equip students with techniques to maintain interest and concentration in online learning. At the same time, attention should be paid to how to balance students' mental and physical health in the context of online learning.

After calculating Cronbach's Alpha system to eliminate unsuitable variables, the author uses exploratory factor analysis (EFA) to evaluate the reliability of the proposed scale. The factor extraction method used by the author for the study is the factor extraction method, the Varimax rotation and the stopping point when extracting the factors with an Eigenvalue of 1. Factor loading in the factor analysis. Discovery factor less than 0.40 will be further rejected. The scale is accepted when the total variance extracted is equal to or greater than 50%.

According to the exploratory factor analysis method, the research model must satisfy certain conditions. The KMO coefficient must be between 0.5 and 1 and the Bartlett model's coefficient of significance must be

statistically significant at 5%. With variables with weight less than 0.5 during EFA analysis, they will be excluded from the research model.

KMO and Bartlett's test results:

Table 6: KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.718
Bartlett's Test of Sphericity	Approx. Chi-Square	1786.889
	df	201
	Sig.	0.000

KMO coefficient = 0.718 > 0.5: factor analysis is suitable with research data. Bartlett's test result is 1786,889 with significance level sig = 0.000 < 0.5. Thus, the hypothesis of the factor model is not suitable and will be rejected, which proves that the data used for factor analysis is completely appropriate.

Testing the scale by confirmatory factor analysis CFA

In testing the scale, the author uses confirmatory factor analysis (CFA). The study uses moment structure analysis because this method has many advantages over the traditional method. The CFA method allows to test the theoretical structure of the scale such as the relationship between the demand for online training and the determinants of online training activities. On the other hand, when using this method, the author can test the convergence value and discriminant value of the scale in a very simple, intuitive and fast way without many procedures. This is the advantage of the method chosen by the author compared with other traditional methods.

To measure the fit of the model with the survey data set, the author uses some evaluation indicators such as Chi-square/df; GFI; AGFI; CFI; RMSEA. If a multiplier model has a Chi-square/df value < 3; GFI, AGFI, CFI from 0.9 to 1: RMSEA < 0.08 is considered a model that fits well with the survey dataset. Thereby, the author will establish well-suited measurement models used to test structural models. Determine the fit of the model based on a number of evaluation indicators as presented above.

Using research data, we analyzed using spss software by principal axis facting method with promax, and the results obtained were obtained by the author taking a rotation matrix of independent scales.

Table 7: Pattern Matrix a

	1	2	3	4
CTDT1	.923			
CTDT2	.920			
CTDT3	.878			
CTDT4	.865			
CTDT5	.843			
CTDT6	.838			
HTDT 1		.884		
HTDT 2		.876		
HTDT 3		.852		
HTDT 4		.787		
HTDT 5		.868		
HTDT 6		.845		
NL 1			.856	
NL 2			.798	
NL 3			.758	
NL 4			.686	
DU1				.840
DU2				.778
DU3				.758
DU4				.584

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.

The author continues to use the above results to make CFA confirmatory factor analysis data. The results obtained are as follows:

This model has Chi-square/df = 1,145 < 2 with p = 0.000. However, other indicators show that this model is consistent with research data (CFI = 0.956; RMSEA = 0.051 < 0.08). The scales of CTDT, HTDT, NL, DU have no correlation between the errors of the variable, so they all achieve unidirectionality.

The correlation coefficient between the components is less than 1 with standard deviation less than 0.05. Therefore, the scales CTDT, HTDT, NL, DU all achieve discriminant value. The normalized weights all meet the allowable standards (>=0.5) and have statistical significance of 0.000. Therefore, the author can conclude that the variables used to measure the composite and the total variance extracted are >0.5, so these components are all reliable.

DISCUSSION

In the context of digital transformation and the COVID-19 epidemic continuing to have many very complicated and unpredictable developments, in order to maintain the learning process, the education and training industry and universities need to make adjustments. This adjustment is aimed at suitable and flexible forms of training. These findings are fully consistent with previous findings that in the context of digital transformation and the COVID-19 pandemic, training programs Creation has been improved to suit the evolving realities of enterprises (UK, 2017; Burns & Rochsantiningsih, 2006).

Universities need to implement tasks and solutions to organize safe teaching, ensure educational quality programs and goals, focus on strongly renovating teaching methods, diversify forms of teaching and learning. How to organize teaching to overcome and respond to the impact of the COVID-19 epidemic and the development of the digital transformation context. At the same time, universities also need to adjust training programs and prepare well resources to improve the quality of education. This is quite consistent with the results of previous research, which said that the introduction of online forms and methods of teaching and education on a digital basis is always an effective way to stimulate creative inquiry. of the teacher. The achievement of learning results directly depends on the capacity of teachers and the perception of universities (Hang Nguyen Thi, 2021).

The development of the fourth industrial revolution requires universities to have a change in awareness, creating a digital learning environment and digital learning materials. From the digital environment, digital learning materials will change teaching and learning methods, thereby gradually forming digital learners and digital teachers. These findings are completely consistent with previous findings that learners' learning outcomes are improved when universities invest in new teaching facilities and equipment (Hang Nguyen Thi, 2021).

According to my research results, in order to successfully implement digital transformation in education and training, the first thing to do is to digitize data, information data sources that focus on digitized input data knowledge, including the design, publication and archiving. These findings are completely consistent with previous findings that human resource training activities are also enhanced to improve the level and ability to operate digital technology platforms at enterprises (Tuan.TM and associates, 2006).

In the context of the pandemic, when social distancing is strengthened to limit the spread of the pandemic, I think it is necessary to focus on upgrading the technology platform. This is an open educational resource that is of paramount importance. The construction of digital learning materials is not only forming a data warehouse but also data to provide knowledge to learners. These findings are completely consistent with previous findings that, for successful digital transformation, each business needs to choose the model to be applied appropriately and must have high-quality human resources (Bruce Weinelt). & John Moavenzadeh, 2017).

From there, the exploitation of digital learning materials will form in learners skills and ability to familiarize themselves with learning tools on digital platforms. In the process of interacting with digital learning materials, learners will leave their personal technical imprints on their abilities, behaviors, and learning tendencies. Thereby, it will help teachers and learners better understand the experience of online training methods, so that learners can be proactive about learning behaviors, methods and goals. These findings are completely consistent with previous findings that the awareness and technology operation skills of human resources trained at universities are the key factors to create successful enterprises. Carter, S., & Yeo, AC-M., 2017).

CONCLUSIONS

It is inevitable that universities change their training methods from face-to-face to online to safely adapt to the Covid 19 pandemic and digital transformation context. Universities have actively adjusted, streamlining content, changing methods and updating educational and training content to suit conditions and situations. By building online teaching plans, universities have successfully created a knowledge revolution, providing learners with more new skills to meet labor market requirements. E-learning has helped develop electronic resources, videos to support student education. Since then, learners have gained many new skills to use effectively in exploiting support tools, document repositories, and online learning materials.

The novelty of this study is determining the necessity of online training compared to traditional training. Find out the problems that need to be solved for educational institutions in the face of changing contexts and actual situations. With the digital learning environment, the learning space of learners is expanded. That enhances the interaction between universities and stakeholders such as learners, families, businesses and society. These interactions exist in both the real and virtual worlds, enhancing the approach to information processing, and

each learner can engage with the community to enhance skills. Universities need to prioritize putting new content and curricula into teaching activities on open technology solutions and open technology platforms to help learners explore and create on new teaching platforms. The next research areas the author will aim to determine the output standards to perfect the development of training programs to link teaching at universities with meeting the needs of human resources for businesses in the current digital transformation context.

RECOMMENDATIONS

Promising areas for further research include the application of educational approaches that combine online and in-person training at the end of the pandemic. At the same time, the study will delve deeply into the conditions and solutions to successfully implement digital transformation in education at Vietnamese universities. Thereby, helping universities create digital labor products that meet the needs of the labor market in the context of digital transformation.

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