International Journal of Management Technology
Vol.4, No 2, pp. 1-12, October 2017
Published by European Centre for Research Training and Development UK (www.eajournals.org)

THE 4.0 INDUSTRIAL REVOLUTION AFFECTING HIGHER EDUCATION ORGANIZATIONS' OPERATION IN VIETNAM

Huynh Van Thai[1] and M. A Le Thi Kim Anh[2]

[1]Faculty of Business Administration – Tourism – Fashion design, Tuy Hoa Industrial College
[2]Faculty of Accounting and Finance, Tuy Hoa Industrial College

ABSTRACT: *The 4.0 industrial revolution (Industry 4.0) will affect almost every sector of the economy, but the degree of impact varies. The most influential are labor-intensive industries such as apparel and electronics. These are industries with hundreds or even thousands of workers, so there will be challenges when automation is increasing. In addition, a higher education organization's success is influenced by factors' operating in it's internal and external environment; a higher education organization can increase it's success by adopting strategies which manipulate these factors to it's advantage. A successful higher education organization will not only understand existing factors but also forecast change, so that it can take advantage of change within the environments in which it operates. The study results showed that there were 150 persons who are the managers of higher education organization in Vietnam who interviewed and answered about 13 questions. Data collected from March 2016 to March 2017 for higher education organizations in Vietnam. The paper had been analyzed KMO test, Cronbach's Alpha and the result of KMO analysis which used for multiple regression analysis. Managers' responses measured through an adapted questionnaire on a 5-point Likert scale (Conventions: 1: Completely disagree, 2: Disagree, 3: Normal; 4: Agree; 5: completely agree). Hard copy and online questionnaire distributed among 1.000 managers of higher education organization in Vietnam. In addition, the exploratory factor analysis (EFA) results showed that there were three factors, which included of factors following human resource quality (X1), macro environment change (X2), technology capabilities (X3) with significance level 5 percent. In addition, all of three components affecting the higher education organizations' operation in Vietnam with significance level 5 percent. The research results processed from SPSS 20.0 software.*

KEYWORDS: Industry 4.0, Higher Education, Organization, High Tech, Internet

INTRODUCTION

At present, the world is rapidly developing the revolution with the 4.0 technology platform. This is a great opportunity for countries to accelerate industrialization and modernization, including Vietnam. The problem is that Vietnam is addressing low-level labor-productivity challenges in order to be ready for a new phase on the basis of industrial science 4.0. After three major Industrial Revolutions in history, the 4th Industrial Revolution (Industrial 4.0) has enabled the development of computer, hardware, software as well as global networks, creating a premise. This shows that we know the emergence of a comprehensive industrial revolution and transforming all aspects of global socio-economic life.

Industry 4.0 is a name for the current trend of automation and data exchange in manufacturing technologies. It includes cyber-physical systems, the Internet of things, cloud computing and cognitive computing. Industry 4.0 creates what has been called a "smart factory". Within the modular structured smart factories, cyber-physical systems monitor physical processes,

ISSN 2055-0847(Print), ISSN 2055-0855(Online)

create a virtual copy of the physical world and make decentralized decisions. Over the Internet of things, cyber-physical systems communicate and cooperate with each other and with humans in real time, and via the internet of services, both internal and cross-organizational services are offered and used by participants of the value chain.

Besides, the Industrial 4.0 is based on three main areas: Digital: Includes Big Data, IOT, Artificial Intelligence (AI); Biotechnology: Applications in agriculture, fisheries, medicine, food processing, environmental protection, renewable energy, chemistry and materials; Physics: Next-generation robots, self-driving cars, new materials, nanotechnology... The Industrial 4.0 has started, but it is breaking the structure of almost every industry in every country, foreshadowing the transformation of the entire production, management and administration system. According to experts' forecasts, the Industrial 4.0 will be the foundation for a dramatic transition from a resource-based, low-cost, to knowledge-based economy. Innovative industries thrive and occupy an increasing share of economic structure in comparison to traditional manufacturing and service industries. Facing this situation, the researcher had chosen topic **"*THE 4.0 INDUSTRIAL REVOLUTION AFFECTING HIGHER EDUCATION ORGANIZATIONS' OPERATION IN VIETNAM*"** as a paper. This paper helps policy makers who apply them for improving policy on the management of the higher education organizations' operation in Vietnam.

LITERATURE REVIEW

Human resource quality play an important part of developing and making a company or organization at the beginning or making a success at the end, due to the labor provided by employees. Human resources are intended to show how to have better employment relations in the workforce. Also, Human resources are to bring out the best work ethic of the employees and therefore making a move to a better working environment.

Besides, the development of human resources is essential for any organization that would like to be dynamic and growth-oriented. Unlike other resources, human resources have rather unlimited potential capabilities. The potential can be used only by creating a climate that can continuously identify, bring to surface, nurture and use the capabilities of people. Human Resource Development (HRD) system aims at creating such a climate. A number of HRD techniques have been developed in recent years to perform the above task based on certain principles. This unit provides an understanding of the concept of HRD system, related mechanisms and the changing boundaries of HRD **(By Kaufman, Bruce E. 2008)**.

A macro environment change is the condition that exists in the economy as a whole, rather than in a particular sector or region. In general, the macro environment includes trends in gross domestic product (GDP), inflation, employment, spending, and monetary and fiscal policy. Besides, population changes also have a direct impact on organizations. Changes in the structure of a population will affect the supply and demand of goods and services within an economy. Falling birth rates will result in decreased demand and greater competition as the number of consumers fall. Conversely an increase in the global population and world food shortage predictions are currently leading to calls for greater investment in food production. Due to food shortages African countries such as Uganda are reconsidered their rejection of genetically modified foods. **(By Daniels, J., Radebaugh, L., Sullivan, D. 2007).**

ISSN 2055-0847(Print), ISSN 2055-0855(Online)

Political factors influence organizations in many ways. Political factors can create advantages and opportunities for organizations. Conversely they can place obligations and duties on organizations. Political factors include the following types of instrument: We have Vietnam legislation such as the minimum wage or anti-discrimination laws. Voluntary codes and practices; Market regulations; Trade agreements, tariffs or restrictions; Tax levies and tax breaks. We have type of government regime e.g. communist, democratic, dictatorship. Non conformance with legislative obligations can lead to sanctions such as fines, adverse publicity and imprisonment. Ineffective voluntary codes and practices will often lead to governments introducing legislation to regulate the activities covered by the codes and practices.

In summary organizations must be able to offer products and services that aim to complement and benefit people's lifestyle and behavior. If organizations do not respond to changes in society they will lose market share and demand for their products and services. **(By Daniels, J., Radebaugh, L., Sullivan, D. 2007)**.

Technology capability has created a society which expects instant results. This technological revolution has increased the rate at which information is exchanged between stakeholders. A faster exchange of information can benefit businesses as they are able to react quickly to changes within their operating environment. However an ability to react quickly also creates extra pressure as businesses are expected to deliver on their promises within ever decreasing time scales. For example the Internet is having a profound impact on the marketing mix strategy of organizations. Consumers can shop 24 hours a day from where ever they want and however they want via smart phones, laptops and tablets.

The pace of technological change is so fast that the average life of a computer chip is approximately 6 months. Technology is utilized by all age groups, children are exposed to technology from birth and a new generation of technology savvy pensioners known as “silver surfers” have emerged. Technology will continue to evolve and impact consumer habits and expectations, organizations that ignore this will hinder their success. **(By Daniels, J., Radebaugh, L., Sullivan, D. 2007).**

METHODS OF RESEARCH

In this research, the observations can be done while letting the observing person who the managers of higher education organization in Vietnam. Observations can also be made in natural settings as well as in artificially created environment. After preliminary investigations, formal research is done by using quantitative methods questionnaire survey of 150 managers of Higher education organization in Vietnam who related and answered nearly 13 questions. The reason tested measurement models, model and test research hypotheses.

This research has 7 steps of this research process following:

Step 1: What's the research problem or question?

Step 2: What's the background?

Step 3: Find the past & current research - books

Step 4: Find the past & current research - articles

Step 5: Find government research & open access articles

ISSN 2055-0847(Print), ISSN 2055-0855(Online)

Step 6: Collect, read, evaluate & write

Step 7: Cite what you found

Data collected were tested by the reliability index (excluding variables with correlation coefficients lower < 0.30 and variable coefficient Cronbach's alpha < 0.60), factor analysis explored (remove the variable low load factor < 0.50). The hypothesis was tested through multiple regression analysis with linear Enter method. Conventions: 1: Completely disagree, 2: Disagree, 3: Normal; 4: Agree; 5: completely agree. Data collected were tested by the reliability index (excluding variables with correlation coefficients lower < 0.30 and variable coefficient Cronbach's alpha < 0.60), factor analysis explored (remove the variable low load factor < 0.50). The hypothesis was tested through multiple regression analysis with linear Enter method. Finally, regression analysis is also used to understand which among the independent variables are related to the dependent variable, and to explore the forms of these relationships. In restricted circumstances, regression analysis can be used to infer causal relationships between the independent and dependent variables.

$$Y = \beta_0 + \beta_1 X1 + \beta_2 X2 + \beta_3 X3$$

Y: the higher education organizations' operation in Vietnam.

β_0 - β_3: Regression coefficients.

X1 – X3: Factors affecting the higher education organizations' operation in Vietnam. Independent variables are following: Human resource quality (X1), Macro environment change (X2), Technology capabilities (X3).

Research model for factors have positive relation to the higher education organizations' operation in Vietnam

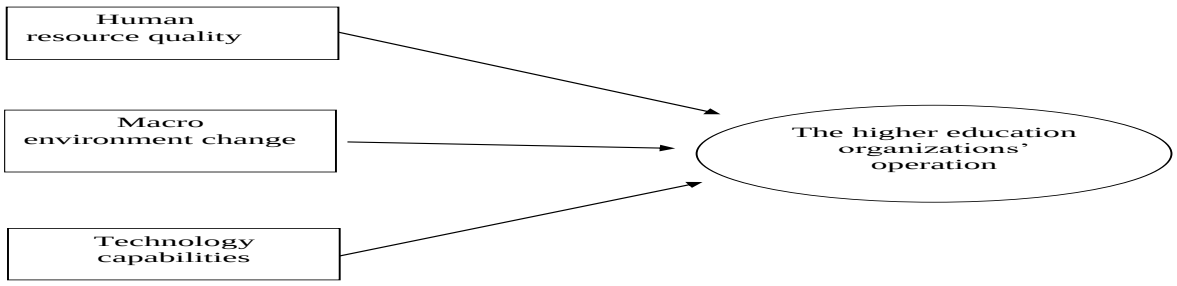

Figure 01: Research model for factors affecting the higher education organizations' operation in Vietnam

Hypothesis: three factors have positive relation to the higher education organizations' operation in Vietnam.

ISSN 2055-0847(Print), ISSN 2055-0855(Online)

RESEARCH RESULTS

Table 01: Cronbach's Alpha test for factors affecting the management of the credit risk at higher education organization in Vietnam

Code	Human resource quality (HRQ)	Cronbach's Alpha
HRQ1	Human Resource quality is sufficient to needs for the management of the higher education organizations' operation	0.914
HRQ2	Human resource training is the task of business priorities of the management of the higher education organizations' operation	
HRQ3	Capacity of forecasting labor demand and supply is good for business in the management of the higher education organizations' operation	
HRQ4	Vietnam Government encourage and facilitates employees to learn and control by industry 4.0 for the management of the higher education organizations' operation	

(Source: The researcher's collecting data and SPSS)

Table 01 showed that all of variables in Human resource quality (HRQ) surveyed Corrected Item-Total Correlation greater than 0.3 and Cronbach's Alpha if Item deleted greater than 0.6 and Cronbach's Alpha is very reliability.

Table 01: continued

Code	Macro Environment Change (MEC)	Cronbach's Alpha
MEC1	Vietnam Economic growth: Natural logarithm of GDP, income	0.917
MEC2	Vietnam Annual Inflation rate: Consumer price index, bank interate	
MEC3	Political and social environment, population change	
Code	**Technology Capabilities (TEC)**	**Cronbach's Alpha**
TEC1	The Vietnam higher education organizations have many modern technologies to meet for the management operations by industry 4.0	0.852
TEC2	The Vietnam higher education organizations have many modern technologies to make new products/Services with high quality for the management of the training and education	
TEC3	The Vietnam higher education organizations have invested many modern technologies to improve the research quality and technology transfer	
Code	**The Vietnam higher education organizations' operation (VHE)**	**Cronbach's Alpha**
VHE1	The macro environment changes are affecting the Vietnam higher education organizations' operation	0.678
VHE2	The technology abilities are affecting the Vietnam higher education organizations' operation	
VHE3	The human resource quality is affecting the Vietnam higher education organizations' operation	

(Source: The researcher's collecting data and SPSS)

Table 01 showed that all of variables surveyed Corrected Item-Total Correlation greater than 0.3 and Cronbach's Alpha if Item deleted greater than 0.6 and Cronbach's Alpha is very

ISSN 2055-0847(Print), ISSN 2055-0855(Online)

reliability. Such observations make it eligible for the survey variables after testing scale. This showed that data was suitable and reliability for researching.

Table 02: KMO and Bartlett's Test for factors of the higher education organizations' operation in Vietnam

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.748
Bartlett's Test of Sphericity	Approx. Chi-Square	1016.421
	df	45
	Sig.	.000

Total Variance Explained

Com.	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3.571	35.707	35.707	3.571	35.707	35.707	3.235
2	2.919	29.190	64.897	2.919	29.190	64.897	2.908
3	1.669	16.694	81.591	1.669	16.694	81.591	2.587
4	.399	3.991	85.582				
…	…	…	…				
10	.088	.884	100.000				

(Source: The researcher's collecting data and SPSS)

Table 02 showed that the results showed that KMO coefficient had: $0.5 \leq KMO \leq 1$ (KMO: Kaiser-Meyer-Olkin). KMO is an index used to examine the appropriateness of factor analysis. KMO value significantly larger factor analysis is appropriate. KMO coefficient is 0.748 and the level of significance (Sig) is 0.000. Exploratory Factor Analysis (EFA) is consistent with survey data of 150 the managers of Higher education organizations in Vietnam but 146 managers processed by SPSS 20.0.

Table 03: Structure Matrix for factors affecting the higher education organizations' operation

Code	Component		
	1	2	3
HRQ3	.936		
HRQ4	.907		
HRQ2	.895		
HRQ1	.829		
MEC1		.971	
MEC2		.914	
MEC3		.882	
TEC2			.934
TEC3			.891
TEC1			.793

(Source: The researcher's collecting data and SPSS)

ISSN 2055-0847(Print), ISSN 2055-0855(Online)

Table 03 showed that there are three factors affecting the higher education organizations' operation. Table 03 showed that there are three factors: human resource quality (X1), macro environment change (X2), technology capabilities (X3).

Table 04: KMO and Bartlett's Test for the higher education organizations' operation (Y)

in Vietnam

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.652
Bartlett's Test of Sphericity	Approx. Chi-Square	69.721
	df	3
	Sig.	.000

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.832	61.061	61.061	1.832	61.061	61.061
2	.660	21.990	83.051			
3	.508	16.949	100.000			

Component Matrix[a]

Code	Component
	1
VHE3	.818
VHE2	.788
VHE1	.735

(Source: The researcher's collecting data and SPSS)

Table 04 showed that the results showed that KMO coefficient had: KMO = 0.652 (KMO: Kaiser-Meyer-Olkin). KMO is an index used to examine the appropriateness of factor analysis. KMO value significantly larger factor analysis is appropriate. KMO coefficient of the higher education organizations' operation is 0.652 and the level of significance (Sig) is 0.000.

ISSN 2055-0847(Print), ISSN 2055-0855(Online)

Table 05: Factors affecting the higher education organizations' operation in Vietnam

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.644[a]	.415	.402	.41485	1.516

a. Predictors: (Constant), X3, X1, X2

b. Dependent Variable: Y

c. Predictors: (Constant), X3, X2, X1

Bootstrap for Model Summary

Model	Durbin-Watson	Bootstrap[a]			
		Bias	Std. Error	95% Confidence Interval	
				Lower	Upper
1	1.516	-.389	.129	.889	1.391

a. Unless otherwise noted, bootstrap results are based on 3000 bootstrap samples

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.312	3	5.771	33.532	.000[b]
	Residual	24.438	142	.172		
	Total	41.750	145			

a. Dependent Variable: Y

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.721	.164		10.490	.000		
	X1	.276	.038	.469	7.242	.000	.985	1.015
	X2	.142	.029	.341	4.979	.000	.880	1.136
	X3	.122	.032	.262	3.857	.000	.892	1.121

Bootstrap for Coefficients

Model		B	Bootstrap[a]				
			Bias	Std. Error	Sig. (2-tailed)	95% Confidence Interval	
						Lower	Upper
1	(Constant)	1.721	.008	.145	.000	1.468	2.031
	X1	.276	-.002	.038	.000	.196	.346
	X2	.142	.000	.028	.000	.086	.196
	X3	.122	.000	.030	.000	.063	.182

a. Unless otherwise noted, bootstrap results are based on 3000 bootstrap samples

(Source: The researcher's collecting data and SPSS)

Table 05 showed that column t > 2 (smaller significance level 0.05) and statistically significant data to explain the variation of the higher education organizations' operation in Vietnam, Adjusted R Square is 0.402 (Adj R^2 = 40.2 %). Besides, the regression coefficient is positive. This means that the impact of the independent variables in the same direction with the higher education organizations' operation. Moreover, the regression results showed the Durbin - Watson stat = 1.516 said no autocorrelation phenomena. Table 05 showed that bootstrap results

ISSN 2055-0847(Print), ISSN 2055-0855(Online)

are based on 3000 bootstrap samples. The bias is very small, nearly is around 0.00. Besides, there is the considering magnification coefficient variance VIF (Variance Inflation Factor). VIF is exaggerated coefficient variance, when VIF value exceeding 10.0 is shown signs of multicollinearity phenomenon. While table 05 results can assert no correlation between the independent variables in the equation. Meaning no multicollinearity phenomenon by VIF values less than 10.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The study results showed that there were 150 managers of higher education organizations in Vietnam who interviewed and answered about 13 questions but 146 managers processed, lack of 4 samples. Data collected from March 2016 to March 2017 for higher education organization in Vietnam. The paper had been analyzed KMO test, Cronbach's Alpha and the result of KMO analysis which used for multiple regression analysis. Managers' responses measured through an adapted questionnaire on a 5-point Likert scale (Conventions: 1: Completely disagree, 2: Disagree, 3: Normal; 4: Agree; 5: completely agree). Hard copy and online questionnaire distributed among 1.000 managers of higher education organizations in Vietnam. In addition, the exploratory factor analysis (EFA) results showed that there were three factors, which included of factors following human resource quality (X1), macro environment change (X2), technology capabilities (X3) that affecting the higher education organizations' operation in Vietnam with significance level 5 percent. The researcher had policies continued to improve the effectiveness of the higher education organizations' operation in Vietnam following. The 4.0 Industrial Revolution is a combination of the achievements of the previous three industrial revolutions in the digital world. People can easily get information and learn the way they want. This revolution will change the workforce in the future.

Recommendations

Recommendation for human resource quality

The higher education organizations need to innovate training modules, credits and online training development will be the main training direction. The training program must be designed flexibly, on one hand to meet the standard of the profession. On the other hand, there is the connection between the levels in a profession and between professions. Besides, the higher education organizations change learner-centered training methods and the application of information technology in lesson design and lesson delivery. Along with that is the reform of the form and method of examination and examination in education - training towards the ability to work and creativity of learners.

The higher education organizations focus more on the development of the automation industry and at the same time invest in in-depth research teams in the areas of digital, information technology, energy and new materials, biotechnology. The higher education organizations promote research in applied research, technology research, teaching aids and information technology application in teaching and training management. The higher education organizations improve the quality of scientific research in professional education institutions, linking research with transfer activities at the grassroots and emphasis on

ISSN 2055-0847(Print), ISSN 2055-0855(Online)

simulated studies, study of human-machine interaction. In addition, there should be a plan and strategy to promote training to improve the quality of human resources in the financial sector, improve professionalism in business operations. Accordingly, human resource training institutions need to step by step organize a variety of training programs at basic as well as advanced levels, researching and publishing standard curricula, standardizing teaching staff rim… It is necessary to improve mechanisms and policies to improve the quality of education, to have mechanisms for coordination and linkages between training establishments, especially vocational training establishments and enterprises participating in vocational training. Complete mechanisms and policies on the development of teachers. Particularly, to pay special attention to renovating the recruitment, use, training and fostering for teachers.

Recommendation for macro environment

The Government needs to pay close attention to the labor-intensive industries that are facing the challenges of the 4.0 industrial revolution. The Government needs encouraging policies for the higher education organizations and enterprises to invest in modern technologies such as exemption from corporate income tax of the previous period if enterprises bring this profit to reinvest in high tech sector in the industry. The policies including the refund of corporate income tax paid in the previous years for investment by the enterprise, but subject to investment in high technologies and technology in line with the trend of the 4.0 industrial revolution.

The Government has supportive policies to reduce taxes and fees for the higher education organizations and enterprises using high technology, energy saving, green and clean production. Currently, besides regulatory standards, the floor rules for mandatory businesses are required to have rules that are higher than the floor level so that businesses that strive to this level will be given certain incentives. In the policy, from which to help the higher education organizations and enterprises have accumulated resources to continue investing in the direction of updating with the level of technology world.

The Government has the policy of supporting the higher education organizations and enterprises in training human resources in accordance with the trend of technological revolution 4.0. This policy will help to create an increasingly qualified workforce, better income, and the ability to change lives and appearances in areas that have previously been deemed low.

Recommendation for technology capabilities

The higher education organizations renew the structure of the education and training system on the basis of national level frameworks, professional skill standards and soft skills standards suitable to the national context and the regional and world countries. The higher education organizations focus on forecasting human resource needs according to occupational structure and training level. On that basis, the State shall make timely adjustments in terms of training in line with the requirements of socio-economic development in each period. Parallel with improving the quality of training, renovating the training model is a very necessary solution. We need to sharply transform the "what the market will need" training model. According to this new model, the link between vocational education and business is a requirement. At the same time, the process of accelerating the formation of corporate training institutions is necessary to share common resources. For workers:

ISSN 2055-0847(Print), ISSN 2055-0855(Online)

determine the 4.0 Industrial Revolution is an indispensable trend, it is happening and nothing can resist. Workers have no choice but to adapt by actively learning, training, anticipating the skills needed for a smart economy and industrialization. Each individual employee must strive to overcome self, first of all, thinking, customary, then self-study, self-equiped knowledge, skills to meet the requirements for new development.

Recommendations for the next research: The above-mentioned things, the next research should survey more than 150 managers of higher education organizations in Vietnam (more than 1.000 managers). This helps the data that is more significant. The study topic is very big area. The next research should survey more than 13 items in components affecting the higher education organizations' operation in Vietnam.

REFERENCES

Ary, D., Jacobs, L., Sorensen, C. & Razavieh, A. (2009). *Introduction to research in education (8th ed.)*. Belmont, CA: Wadworth.

Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership (2nd ed.).* Mahwah, NJ: Lawrence Erlbaum Associates Publishers; US.

Berg, B. (2001). *Qualitative research methods for the social sciences*. Boston: Allyn and Bacon.

Blanchet, Max; Rinn, Thomas; Thaden, Georg von; et al. (2014). *Industry 4.0. The new industrial revolution. How Europe will succeed*. Munich: Roland Berger Strategy Consultants.

Blaug, Mark (2007). *The Social Sciences: Economics*. The New Encyclopædia Britannica.

Daniels, J., Radebaugh, L., Sullivan, D. (2007). *International Business: environment and operations, 11th edition*. Prentice Hall. ISBN.

General Statistics Office (2007-2015). *Labor Force Survey*.

General Statistics Office (2016). *Labor Force Report of Vietnam: Current situation and solutions*.

Heneman III, Herbert; Judge, Timothy A (2005). *Staffing Organizations*. USA: McGraw-Hill. ISBN.

Hughes, Thomas P. (2004). *Human-Built World: How to Think About Technology and Culture*. Chicago: University of Chicago Press.

Joshi, Rakesh Mohan, (2005). *International Marketing, Oxford University Press*. New Delhi and New York.

Kaufman, Bruce E. (2008). *Managing the Human Factor: The Early Years of Human Resource Management in American Industry*. Ithaca, New York: Cornell University Press.

Lussier, R. N., & Achua, C. F., (2010). *Leadership, Theory, Application, & Skill Development. (4th ed)*. Mason, OH: South-Western Cengage Learning.

Merriam, S. (1998). *Qualitative research and case study applications in education*. San Francisco.

Ministry of Labor, Invalids and Social Affairs (2017). *Vietnam Labor Market Update Newsletter*. No. 12, Quarter IV / 2016.

Mumford, M. D.; Zaccaro, S. J.; Harding, F. D.; Jacobs, T. O.; Fleishman, E. A. (2000). *Leadership skills for a changing world solving complex social problems*. The Leadership Quarterly.

Watkins, A. E.; Richard L. Scheaffer, George W. Cobb (2008). *Statistics in action: understanding a world of data*. Emeryville, CA: Key Curriculum Press.

ISSN 2055-0847(Print), ISSN 2055-0855(Online)

World Economic Forum (2015). *Global Competitiveness Report 2015-2016*.

ISSN 2055-0847(Print), ISSN 2055-0855(Online)