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FACTORS INFLUENCING ON HUMAN RESOURCES DEVELOPMENT IN SMES SERVICE ENTERPRISES IN INDUSTRY 4.0: THE CASE OF THAI NGUYEN PROVINCE, VIETNAM

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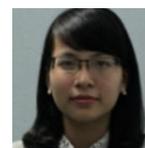
ABSTRACT

The study was conducted to analyze the factors and the level of influencing on human resource development for small and medium-sized service enterprises in Thai Nguyen province in Industry 4.0 because of artificial intelligence (AI) and the machines that make labor supply and labor fluctuations. With the dramatically changes of technology in the Industrial Revolution 4.0, jobs with creativity and flexibility, machines and robots cannot replace human resources. Employers will need high quality human resources, multi-disciplinary knowledge and flexible adaptations to changes in production methods in an era of technology. The research results show that there are 6 factors that positively influencing on human resource development for SMEs service enterprises in Thai Nguyen province in the Fourth Industrial Revolution.

Contribution/Originality: This study contributes to the existing literature by identifying to what factors affecting on human resources development in SMEs service in Thai Nguyen province, Vietnam in Industry 4.0.

1. INTRODUCTION

In the process of existence and development of enterprises; human resources, especially higher quality human resources are the resources that influence the development of enterprises, especially in the context of the Industrial revolution 4.0 will create major changes in labours supply and demand. Thai Nguyen province is in a period of "*population surplus*" or "*golden population*" with more than 50% of the population in working age. Population benefits provide a great opportunity for Thai Nguyen province as well as Vietnam to make the most of this abundant human resource and create strong pressure to secure jobs, meet the needs of education and training, and improve the quality of human resources. In terms of quantity, Vietnam seems to have an advantage in terms of labours. However, the quality of workforce through trained technical expertise shows that this is a worry issue. Some labours market reports assessing the industrial revolution 4.0 not only threatens the employment of low-level labourers, even middle-skilled workers, will suffer if they do not acquire new knowledge, mainly creative skills.

Industrial revolution 4.0 also poses many challenges, especially which will dramatically change the structure of labours and the labours market. Therefore, the development of human resources for businesses in general and small and medium service enterprises in Thai Nguyen province in general needs to be focused in order to improve the

quality of human resources to meet future requirements. However, human resource development for small and medium service enterprises in Thai Nguyen depends on many factors. Therefore, identifying the factors affecting human resource development for small and medium-sized service enterprises in Thai Nguyen province is an urgent issue to provide solutions for Thai Nguyen province as well as service enterprises small and medium.

Many authors conduct research on factors affecting the development of human resources for businesses such as Beaver and Jennings (2001); Coetzer (2006) to study managerial competency factors in Human resource development of small businesses, Jameson (2000) studied recruitment and training in small businesses, Nguyen (2015) with research on human resource development in small and medium-sized enterprises. Hung Yen's garment industry has analyzed the factors of state and local policies, changes in science and technology and human resource development policies in small and medium-sized enterprises. All studies show that all influencing factors are positively related to the development of human resources for businesses. Due to the characteristics of natural and economic conditions in different countries, the factors and the level of influence on human resource development of SMEs in Thai Nguyen province, so a new point of the study was conducted to find understanding the factors of the system of training and vocational institutions and individual factors affecting the development of human resources for SMEs in Thai Nguyen province; thereby suggesting some solutions to improve the quality of human resources for SMEs in Thai Nguyen province in the digital revolution.

2. RESEARCH SITE

Thai Nguyen province is one of the political, economic and educational centre of the Northern mountainous midland in Vietnam. Thai Nguyen province is a gateway for socio-economic exchanges between mountainous midland and Northern delta and exchanges were made through the road system and railway that Thai Nguyen city is the central node for. Along with trending of economic development and the Industrial revolution 4.0 in Vietnam as well as the northern mountainous midland, Thai Nguyen province; with favorable conditions on geographic location, socio-economic characteristics; has created favorable conditions for the enterprise's development. In addition, with the policies about investment and enterprise development of Thai Nguyen's provincial leaders, many industrial zones and enterprises have established and attracted thousands labours from others provinces to work; especially with the number of non-state enterprises and employees who worked in this area increasing annually per year. However, Thai Nguyen's employees in non-state enterprises have lacking in various skills in order to adapt the changing of the Industry 4.0. So that, the author selects Thai Nguyen province for the research site (Thai Nguyen Statistical Office, 2018)

3. METHODOLOGY

3.1. Data Collection

The sampling frame is managements and labors worked in SMEs service enterprises in three economic sectors: Agriculture, forestry and fishing enterprise; Manufacturing, construction enterprise and Service enterprise. As a general rule, the minimum is to have at least five times as many observations as the number of variables to be analyzed (Hair, Black, Babin, & Anderson, 2014). In this study, there were 42 observations, so the number of samples should be 210 variables. Two focus groups were held, so the author decided to investigate 280 samples. The number of valid responses was 262.

3.2. Data Analysis

In order to evaluate the factors influencing human resource development for SMEs service enterprises in Thai Nguyen province in Industry 4.0, the study uses a set of similar questions measured by a 5-point Likert scale with level 5 showing "Strongly agree and "Strongly disagree" (Jamieson., 2004) and have been tested for reliability using Cronbach's Alpha coefficients to eliminate inappropriate variables. Variables whose total correlation coefficient is

167

less than 0.3 are excluded (Nunnally, 1978) and the reliability of the scale is acceptable when Cronbach's Alpha coefficient is greater than or equal to 0.6 (Hair et al., 2014). The study uses SPSS 20 software to analyze the impact factors affecting human resource development for SMEs service enterprises in Thai Nguyen province in the digital revolution through a multivariate regression model. The multivariate regression model is very useful for analyzing factors affecting human resource development for SMEs, so the author chooses the following multivariate regression model to consider 6 factors affecting human resource development for SMEs in Thai Nguyen province in Industry 4.0.

$$PTNL = \beta_0 + \beta_1\ CSNN + \beta_2\ CSDT + \beta_3\ KHCN + \beta_4\ CSDN + \beta_5\ NQL + \beta_6\ CNLD + u$$

In which:

u: estimation error.
CSNN = State and provincial policies for SMEs human resource development.
CSDT = System of training and vocational institutions.
KHCN = The development of science and technology.
CSDN = SMEs human resource development policy.
NQL = Business manager.
CNLD = Individual employee.

Influence level of factors expressed through coefficients $\beta 1$ to $\beta 5$ in the multivariate linear regression equation. Independent variables with a larger factor b will have a greater influence. The independent variables with coefficient $\beta > 0$ will have the same direction as the dependent variable, the independent variable $\beta < 0$ will have the opposite effect with the dependent variable.

4. RESULTS AND DISCUSSION

4.1. Human Resources in Small and Medium-Sized Service Enterprises in Thai Nguyen Province in Industry 4.0

From 2013 to 2018, Vietnamese Government has formulated and completed the supporting policies for SME development in general and human resource development for small and medium-sized service enterprises in particular. The human resource training and development plan for SMEs is integrated into the five-year, five-year socio-economic development plans of the ministries and localities. Resolution No. 35 / NQ-CP dated May 16, 2016 on supporting business development up to 2020, affirming that enterprises are the service subjects, creating all favorable conditions for people and businesses to start businesses, business freedom in industries that are not prohibited by law. Strong support and flexible mechanism in creating an open, transparent, attractive and favorable investment environment for investment attraction and business development, improvement of administrative procedures and construction infrastructure, … of Thai Nguyen Provincial People's Committee (2017) has facilitated many domestic and foreign enterprises to establish, thereby contributing to creating jobs for many human resources of Thai Nguyen province as well as other provinces in the region. According to Figure 1, in the period of 2013 - 2018, the number of employees working in the service enterprises increased rapidly, especially in 2017 with a growth rate of 41%. In 2013, the number of employees working in the service enterprise was 16,833 people; the number of employees increased to 32,020 people in 2018.
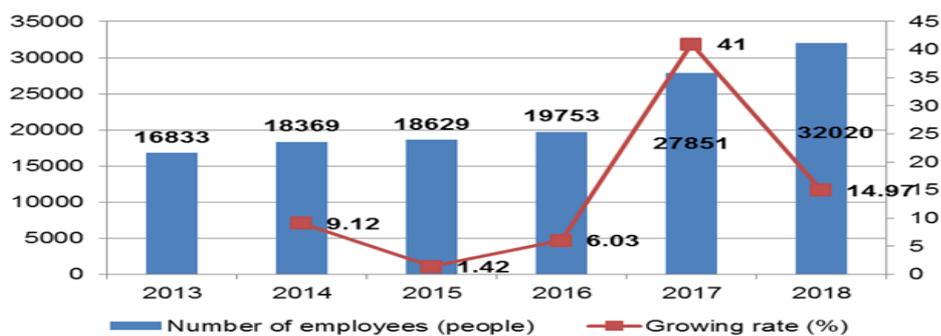

Figure-1. Total number and growth of human resources in the SMEs service enterprises in Thai Nguyen province.
Source: Thai Nguyen Statistical Office (2017); Thai Nguyen Statistical Office (2019).

The quality of human resources has changed in the Industrial revolution 4.0 but at a slow pace and has not really met the changes of technology. In Thai Nguyen province, the number of untrained workers, short-term trained workers and primary qualifications is still relatively high, the percentage of skilled workers, high-quality workers (university, above university level) is still low on the total number of labor force working in enterprises as well as in comparison with other regions across the country and is not commensurate with the potential of the province. Meanwhile, in Thai Nguyen province, there are many SMEs service enterprises operating in the future associated with automation processes such as wholesale and retail trade; repair of motor vehicles, and motorcycles, Information and communication etc. requiring universal labor and this is the object that will be greatly affected when there is a change of new technology. For example, for the wholesale and retail trade, IoT provides an opportunity for retailers to connect with customers to enhance the in-store experience. Smartphones will be a way for retailers to stay connected with consumers even when away from the store. Interacting through smartphones and using Beacon technology can help retailer's better serve consumers. They can also follow the path of consumers inside a store to improve store layout and place premium products in high-traffic areas. Thus, the impact of Industry 4.0 on employment will be the shift from labor-intensive production to knowledge-intensive and technology-intensive (Vietnam Central Institute for Economic Management, 2018).

Vietnamese labors in general as well as employees of SMEs service enterprises in Thai Nguyen province in particular are not active and creative at work as well as lack of skills and innovations in the working process. According to Manpower Group Solutions (2018) Vietnam's human resources index is ranked 62 in the world and 14th in the Asia-Pacific region; only 5% of workers are proficient in English and only 10.4% are highly skilled workers. Vietnam has faced many challenges, especially the competitiveness to retain and find jobs of low-skilled workers. In a report published by World Economic Forum (2018) of a total of 100 countries, Vietnam falls into the group of countries not ready for the 4th industrial revolution; quality of human resources ranked 70 and indicators related to innovation and quality of human resources at a very low level.

Table-1. Vietnam's labor ranking in the Industrial Revolution 4.0 (Rank/100).

	Vietnam	Singapore	Malaysia	Thailand	Philippine	Cambodia
Current labor force						
Knowledge-intensive employment	81	1	45	78	50	87
Availability of scientists and engineer	70	9	7	51	66	96
Digital skills among population	66	6	14	51	42	89
Future Labor Force						
Country capacity to attract and retain talent	44	4	12	35	50	38
Quality of universitie	75	50	23	28	47	75
Quality of math and science education	68	1	16	66	60	86
Quality of vocational training	80	9	11	59	40	92
Critical thinking in teaching	63	18	14	78	35	49
Active labor policies	50	2	9	44	65	68
On-the-job training	74	3	12	56	34	86
Hiring and firing practice	39	3	10	25	55	27

Source: World Economic Forum (2018).

Table 1 has illustrated that Vietnam's labor rankings are much lower than in some Southeast Asian countries. Most of the quality indicators of human resource readiness for Industry 4.0, Vietnam ranked later Singapore, Thailand, Malaysia and the Philippines; only ranked higher than Cambodia. Human resources of Thai Nguyen province are always concerned by the State and provincial leaders with orientations and policies on human resource development in order to meet the changes of new science and technology but effectively implement policies has limited. Although the province's human resources are in the "golden population" stage, they are still mainly unskilled labor, a relatively large number of unskilled labor or simple jobs. In addition to the low level of unskilled labor, the labor force with university and post-graduate education in the province has not really met the recruitment requirements of enterprises because the qualification does not meet the real requirements. In fact, the adaptability of workers is not high, the application and creativity of knowledge to work is limited.

With the dramatically changes of technology in the Industrial Revolution 4.0, jobs with creativity and flexibility, machines and robots cannot replace human resources. Employers will need high quality human resources, multi-disciplinary knowledge and flexible adaptations to changes in production methods in an era of technology. Therefore, Thai Nguyen province leaders, SMEs as well as workers should proactively improve the quality of human resources to adapt the changing in the digital age.

4.2. Factors Influencing Human Resource Development for Small and Medium-Sized Service Enterprises in Thai Nguyen Province in Industry 4.0

After conducting the Cronbach's Alpha reliability test of scales, the results show that the 7-scale used in this study has met the requirements for the information coefficients. Therefore, the Cronbach's Alpha coefficient> 0.6 and the correlation coefficient - total ≥ 0.3 is retained for analysis in the next step. The specific results of Cronbach's Alpha coefficients has illustrated in Table 2.

Table-2. Reability statistic of variables.

No	Component	Observed variable	Source	Number of Items	Cronbach's Alpha
	Independent variable				
1	State and provincial policies for SMEs human resource development	CSNN	Hill and Stewart (1999) Li and Chris (2008) Nguyen (2015)	4	,882
2	System of training and vocational institutions	CSDT	Li and Chris (2008)	6	,855
3	The development of science and technology	KHCN	Hill and Stewart (1999) Nguyen (2015)	5	,804
4	SMEs service enterprises human resource development policy	CSDN	Hill and Stewart (1999) Jameson (2000) Nguyen (2015)	12	,880
5	Business manager	NQL	Beaver and Jennings (2001) Coetzer (2006)	4	,797
6	Individual employee	CNLD		7	,809
	Dependent variable				
7	SMEs service enterprises human resource development in Industry 4.0	PTNL		4	,699

According to Table 3, among the variables affecting human resource development for small and medium-sized service enterprises, the regression results show that 6 variables have statistical significance with 95% reliability. The adjusted R^2 value (Adjusted R Square) more accurately reflects the model's suitability with the whole, we have the adjusted R^2 value of 0.462 (46.2%); 46.2% of the variation of human resource development variables is due to non-model variables and random errors. Test the statistical value F with the value of Sig. = 0.000 <0.05, this means that

the independent variables are linearly correlated with the dependent variables, or show linear regression model multiples matching data sets and variables meet the acceptance criteria. Variance Inflation Factor (VIF) is very small, with values less than 3, indicating that the regression model does not violate the hypothesis of multi-collinear phenomena. Research figures have statistical significance.

Table 3 has shown that 6 variables of the model are statistically significant, with Sig value of t-test all less than 0.05. In which, the beta coefficients are positive, so they have a positive impact on the development of human resources for small and medium-sized service enterprises in Thai Nguyen province in the Industry 4.0.

Table-3. Multivariate regression results.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Constant	1,380	,181		7,616	,000		
CSNN	,084	,030	,150	2,797	,006	,734	1,362
CSDT	,067	,032	,105	2,132	,034	,866	1,155
KHCN	,115	,032	,188	3,557	,000	,752	1,329
CSDN	,221	,050	,238	4,387	,000	,716	1,396
NQL	,141	,034	,222	4,136	,000	,730	1,369
CNLD	,097	,042	,122	2,321	,021	,761	1,314

The standardized regression equation for factors affecting human resource development for SMEs service enterprises in Thai Nguyen province in the digital revolution is as follows:

$$PTNL = 0.150CSNN + 0.105CSDT + 0.188KHCN + 0.238CSDN + 0.222NQL + 0.122CNLD$$

4.3. Discussion

The research results have shown 6 factors influencing human resource development for SMEs service enterprises in Thai Nguyen province as follows:

State and provincial policies for SMEs human resource development have a positive relationship with human resource development for SMEs service enterprises, with a beta coefficient is 0.150. In recent years, the Government has developed, adjusted and completed many policies to support the development of SMEs in general and human resource development activities for SMEs in particular in the Industry 4.0. The most recent is Decree 39/2018 / ND-CP detailing a number of articles of the Law on Supporting SMEs to replace Decree No. 56/2009 / ND-CP dated June 30, 2009, human resource development support activities for SMEs are stipulated in Article 14. Thai Nguyen Provincial People's Council issued Resolution 04/2012 / NQ - HDND on Human Resource Development Planning Thai Nguyen province, period of 2012-2020 but mainly developing general human resources of the province and there is no specific policy on human resource development for SMEs in Industry 4.0. This result is similar to the research of Hill and Stewart (1999); Li and Chris (2008) and Nguyen (2015).

The regression results show that the provincial system of training and vocational institutions have a positive relationship with human resource development with a beta is 0.15 while educational Institutions provide a number of huge human resources for businesses in general and the service industry in particular. In 2018, the number of high school graduates was 13,828 students, Intermediate level was 8,652 students, College graduates were 4,892 students and University graduates were 12,670 students (Thai Nguyen Statistical Office, 2019). Therefore, the system of education and training institutions need to renovate training and education methods in order to enhance the role of training institutions in order to develop human resources with multidisciplinary knowledge and skills. According to the research of Hill and Stewart (1999) and Nguyen (2015) science and technology is one of the factors affecting human resource development, when there is a change in science and technology will affect actively developing human resources for businesses. The development of science and technology has a positive relationship with human resource development in the digital revolution with a beta is 0.188. This is consistent with the

hypothesis with the research of Hill and Stewart (1999) and Nguyen (2015). The impact of science and technology is strongly promoting the creation of a digital economy in which data becomes the most valuable resource that needs to be circulated in the most convenient way. Also under the influence of 4.0 technologies, e-commerce activities continue to grow at a new scale and intensity with the popularity of goods and service transactions via the Internet and social networks with the popularity of online payment and new types of financial technology (fintech). The impact of technology 4.0 also contributes to the creation of a sharing economy with new business models based on new technologies to take advantage of idle resources in the society, showing superiority in business. The appearance of transportation services based on software applications via the Internet such as Uber, Grab, Bee are examples.

The human resource development policies of SMEs service enterprises include attracting and recruiting, arranging and using, training and developing, evaluating work performance, wages and remuneration. The regression results show that the human resource development policy for enterprises has the same direction and the most influence on human resource development in the digital revolution with a beta is 0.238. This is consistent with the hypothesis with the research of Hill and Stewart (1999); Jameson (2000) and Nguyen (2015). In the enterprise, there are differences in the development of human resources for professionals with high qualifications, those with high professional qualifications, desires, perceptions and conditions for improving professional qualifications and skills. Moreover, workers with low professional qualifications face many difficulties in human resource development, especially their own capabilities. Therefore, SMEs need to support and improve policies for workers who have many opportunities to learn and participate in training to develop their own capacity better.

The business manager has a positive influence on the development of human resources for SMEs service enterprises, with a beta is 0.222 with the influencing level behind the policy variable of the business. This result is in the same opinion as some studies conducted by Beaver and Jennings (2001); Coetzer (2006). Managers play a role in encouraging, motivating and learning opportunities for employees to improve their skills and qualifications. In addition, the manager helps find and organize training programs for employees in the enterprise to develop human resources in the digital revolution. Therefore, it is essential to improve the capacity of managers with the changes of Industry 4.0, contributing to the development of human resources for enterprises in Thai Nguyen province.

The regression results show that individual employees positively affect the development of human resources for businesses with a beta coefficient is 0.122. This is a new factor proposed by the author in the study. In the digital revolution, in addition to well-qualified workers, suitable for the job, there is a need for multidisciplinary knowledge, many skills in information technology, foreign languages, teamwork skills, problem solving, professional ethics, adapt quickly, be good at creative thinking with technological innovation in the Industrial revolution 4.0. The workers in Thai Nguyen province work for businesses are mainly low-skilled workers, easily replaced by robot workers, smart technology equipment … Therefore, it is the individual worker self-determination to develop their own capacity to adapt to the changes when automation replaces people in the entire economy, workers will be redundant and that worsens the gap between profits compared to capital and profit compared to labor.

Due to the characteristics of natural conditions, socio-economic conditions as well as the context in different countries and provinces of Vietnam, the factors and the extent of affecting human resource development for enterprises translate into SMEs businesses of Thai Nguyen province in the digital revolution are also different. The research has achieved basic objectives, research content and methods, and has been scientifically sound, but there are some limitations such as the number of small and medium-sized service enterprises yet to be implemented. The whole survey was focused on a group of small and medium-sized service enterprises in Thai Nguyen province. All factors affecting human resource development for SMEs service enterprises have not been analyzed and synthesized.

5. CONCLUSION

The research results show that there are 6 factors that positively influencing on human resource development for SMEs service enterprises in Thai Nguyen province in the Fourth Industrial Revolution includes State and provincial policies for SMEs human resource development, System of training and vocational institutions, The development of science and technology, SMEs human resource development policy, Business manager and Individual employee. From the results of the study, the study recommends that these factors are recognized as a vitally important element of human resource development for SMEs service enterprises in Thai Nguyen province in Industry 4.0. Further studies should conduct a comprehensive survey, analyze and synthesize all factors influencing human resource development for SMEs service enterprises in Thai Nguyen province with changes of State and local policies, human resource development policies of SMEs service enterprises, etc. and there may be new elements that have not been implemented in this study.

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