Human Capital Components of Production Supervisors in the Vehicle Parts Industry in the Eastern Economic Corridor

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ABSTRACT

This research aims to study human capital components of production supervisors in the vehicle parts industry in the Eastern Economic Corridor (EEC). The samples of the research consist of 270 production supervisors in vehicle parts manufacturing in the EEC. The research instrument was a questionnaire to which the respondents provided 202 responses. The findings of confirmatory factor analysis conducted for this paper show that the human capital components of production supervisors can be categorized into three key components, which include 1) working capability, 2) working knowledge, and 3) working skills. The working skills component can be further divided into three subcategories: English skills, problem-solving and coaching skills, and information technology skills. In addition, as it found that working skills ($\beta = 0.97$, $R^2 = 0.93$) comprise the most important human capital component for production supervisors in vehicle parts manufacturing in the EEC. Working capability ($\beta = 0.84$, $R^2 = 0.70$) and working knowledge ($\beta = 0.75$, $R^2 = 0.56$) are second and third, respectively.

Keywords: Human capital, Vehicle parts industry, Eastern Economic Corridor

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Introduction

The Eastern Economic Corridor (EEC) is a pilot project to drive the country's economy and uplift the fast-growing industrial development in the region. The project ensures investor confidence in the current industrial strength of the EEC in sectors such as automotive and vehicle parts, electronic devices, and petrochemicals. There is also a plan to turn the EEC into a gateway that links ASEAN, China and India with effective transportation and free trade areas. The EEC is a strategic hub for investment from high purchasing power investors from ASEAN, China and India. It is also a manufacturing hub and export center featuring various unique components, such as advanced agricultural, industrial and petrochemical systems. The infrastructure of the EEC is investment-friendly and a global hub for both investment and tourism [27]. Chachoengsao, Chonburi and Rayong Provinces have been designated for the development of the EEC, a pilot project for the economic development of Thailand's Eastern Seaboard under the Thailand 4.0 scheme in which electric vehicle production is one of ten crucial industries projected to drive economic development for concrete stability, wealth, and sustainability [16, 26].

The basic concept of electric vehicle (EV) technology is that the vehicle uses electric power for propulsion [7]. The global electric vehicle market is likely to grow dramatically in the future with the expectation to grab 23% of the market share of new global automotive sales by 2025, and is expected to increase to 59% by 2030 [9]. The operation of the electric vehicle industry is aimed at improving the strength of the automotive and vehicle parts industries, which are parts of automotive industry's supply chain that have been supported continually by the government for more than 50 years. Also, Thailand has been ranked among the top 100 vehicle parts manufacturing bases in the world. This means Thailand is ready to provide resources for the industry especially human capital, which is considered to be a crucial asset to drive economic development and growth [1, 2, 16]. Helping employees to become more efficient and productive will have a positive impact on manufacturing effectiveness and other factors throughout the entire economic system. Thus, studying the components of human capital in production supervisors in the vehicle parts industry in the EEC will benefit vehicle parts manufacturing in terms of production supervisor development plans so that they can improve their work more effectively. The study also helps determine the most suitable qualifications of production supervisor so that these can be used for further recruitment and selection of fit employees for each organization.

Objective of the study

To study the human capital components of production supervisors in vehicle parts industry in the EEC.

Literature Review

Definition of human capital

As regards to the theoretical and conceptual studies and related research, the concept of "human capital" was originated in the eighteenth century by Adam Smith. Later, it was studied by Gary Becker, an economist who specialized in human capital. He has defined this concept as a human capital theory which is focused on investment to elevate the working skills and effectiveness of employees in an organization in order to achieve greater performance [21]. Human capital refers to people who work in an organization and are deemed to be essential assets of the organization. They are the ones who support growth and development such as capital and machinery. Human capital value in each person is originated by improving

knowledge, skills or expertise, and competencies through training and education [3]. According to [6], human capital refers to knowledge, capabilities, skills or expertise, creativity and cumulative working experience that can develop value to the company for further improvement. Human capital is also considered to be the company's crucial resource that no one can copy. It maintains and adds value to help the company to become recognized as a successful business at both the national and international level, and to maintain sustainable growth [15, 17]. According to the previously mentioned definitions, human capital means the knowledge, skills and capability accumulated by employees through education, training and development, as well as experiences learnt from both internal and external organizations which are essential for working management and the increase of quality and performance.

Human capital components

Nowadays, human capital theory plays a prominent role in improving companies. Human capital, people, or employees work for the company and share benefits with the business. To achieve company goals, human capital efficacy is an essential key [22]. Human capital refers to employees who hold expertise, knowledge, creativity, understanding of the company's working environment, cooperation and motivation to achieve the goals [30]. Moreover, human capital is considered to be a crucial component in leveraging the company and employee performance to compete in the competition [23]. In the meantime, the goal is also to deliver satisfaction to employees. The important components of building human capital include 1) capabilities that are acquired by previous learning, 2) skills that are necessary for current work, 3) accumulated experience, and 4) specific working skills of individuals, sometimes referred to as "know-how." In conclusion, human capital refers to knowledge and skills to add value [32]. Furthermore, according to [31], the primary components of human capital consist of capability level, knowledge, and skills or expertise of individuals that help to enhance working efficiency and performance. However, with regard to human capital for work, the researcher has reviewed academic papers and research conducted by different scholars such as those listed in the endnotes numbered [4, 10, 14, 18, 20, 21, 25, and 33], from which the following conclusions can be drawn:

1. Working capability refers to the ability to explain concepts, principles, procedures, development, improvement, design review, techniques and systems of a company's workflow for supporting imminent changes in order to run the workflow effectively and achieve target goals. The planning and change management is comprised of effective production planning management, frequent improvement of activities to support production process and quality, frequent creation of activities to reduce production cost, teamwork capability, strict observance of rules, discipline and regulations of the organization, self-learning and new knowledge acquisition, understanding of the changes that affect the organization's performance and image, self-management and work responsibility and timing and work life balance management.

2. Working knowledge refers to the understanding of facts or information that employees gain from training and development programs and previous working experience. The knowledge, which includes employees' ability to remember and/or understand core product details, working tools, workflow details and standards, and product details and standards, has been accumulated in the form of memory and comprehension, which can be analyzed, compared, interpreted and implemented to run the employees' work effectively.

3. Working skills refer to the expertise or talent needed in order to successfully perform a job or task. Skills are gained from training and development programs and previous working experience that help employees to achieve duties and responsibilities properly, swiftly, and effectively. Skill sets that will help employees to achieve their goal effectively include expertise in English, IT, analytical thinking, problem-solving, coaching and data transfer. Correct utilization of employees' skills and expertise to reflect working capability and behavior is an important factor in achieving organizational goals, such as working responsibly, working compatibly with other employee, understanding the organization's vision and mission, as well as following the regulations of the organization.

Research methodology

Population and sampling

The purpose of this research was to study the human capital component of production supervisors in vehicle parts manufacturing in the EEC. The population of the study was production supervisors of vehicle parts companies in the EEC located in the Provinces of Chacheongsao, Chon Buri and Rayong, consisting of 680 companies in 14 industrial estates [12], who are planning and controlling production to achieve the company target. Unfortunately, since there is no actual number of production supervisors, the researcher then decided to set population number at 680. The sample size of 270 was determined using the Rules of Thumb technique, which states that there should be at least 100 samples or 10 times the number of observatory variables [11]. There are 27 observatory variables in total in this research and, therefore, there are 270 samples from this sampling group when using 10:1 ratio. Selecting a sampling group using stratified random sampling based on the population proportion will help get the desired sampling group [13].

Research instruments

This research was conducted using a questionnaire. The questionnaire was created with the guidance of literature reviews from an academic document and theory, including related research about variables. In order to examine the content validity, the researcher offers five professionals to review the extensiveness and validity of the content, and appropriateness of the languages used. After this researcher proceeded to use Index of Item-Objective Congruence (IOC) by utilizing the congruence measurement score of 0.50 [8]. The results show that 27 questionnaire samples regarding production supervisors' opinions about human capital have an IOC of more than 0.5, which means that all the questions passed under the congruence standard. Regarding reliability, the researcher tried out the verified content validity questions approved by the experts with a sample sampling group of 30 participants in order to analyze the reliability of Cronbach's Alpha Coefficient. The reliability value should be more than 0.70 [29]. If the reliability is less than 0.70, the researcher should cut off some questions to increase the reliability value. This is considered by the propriety of questions in which the reliability analysis in the questionnaire of more than 0.70 is equal to 0.95, which shows that all questions are reliable.

Data collection

Questionnaires have been used to collect the data. The questionnaire was created from theorical study and related research. The questionnaire will be divided into 3 sections, including 1) general information about the participants (alternative questions), 2) human capital of production supervisors (this section combines 27 questions rated by a 5-point Likert scale arranged from "strongly disagree" to "strongly agree"), and 3) additional suggestions (open-ended questions are used).

Measures

Human capital was measured by using components consisting of working capability, working knowledge, and working skills that are derived from academic studies and related research. A five-point Likert scale was used with the responses ranging from low to high (1-5). The questions are operated according to the following definitions.

Human capital refers to accumulation of knowledge, skills and capability of employees gained from education, training and development, as well as experiences learnt from both internal and external organizations which are essential for working management and the increase of quality and performance. Human capital measurement is defined as follows:

1. Working capability is measured by 10 indicators consisting of understanding the changes that have an impact on the organization's working procedure and image (CPW1); managing yourself and responsibility efficiently (CPW2); playing a role as a good leader and follower (CPW3); managing work-life balance very well (CPW4); new learnings new things by yourself (CPW5); improving activities that support productivity regularly such as Kai Zen, Suggestions etc. (CPW6); following to rules and regulation of the organization strictly (CPW7); improving activities that has an impact on cost reduction regularly, such as reducing working time, minimizing waste stuff etc. (CPW8); working well with team environment (CPW9); and planning the production process effectively (CPW10).

2. Working knowledge is measured by 5 indicators consisting of understanding of working tools (KNW1); workflow understanding (KNW2); remembering and understanding workflow details and standards (KNW3); remembering and understanding of quality standard details (KNW4); and remembering and understanding of core product details (KNW5).

3. Working skills are measured by 3 indicators as follows:

3.1 English skills is measured by 4 indicators consisting of correctly understanding of the English text after reading (EGS1); effective English writing and communication skills (EGS2); English communication with colleagues and foreigners (EGS3); and using English for coordination with domestic and international organizations (EGS4).

3.2 Problem-solving and coaching skills is measured by 5 indicators consisting of working negotiation for production efficiency enhancement (SCS1); analysis and decision to solve the problem happening in production unit in order to achieve target goal (SCS2); coaching followers to understand how to work efficiently (SCS3); applying creative methods in the current working methods for the most effective output (SCS4); and correctly transferring production-related knowledge to colleagues and followers (SCS5).

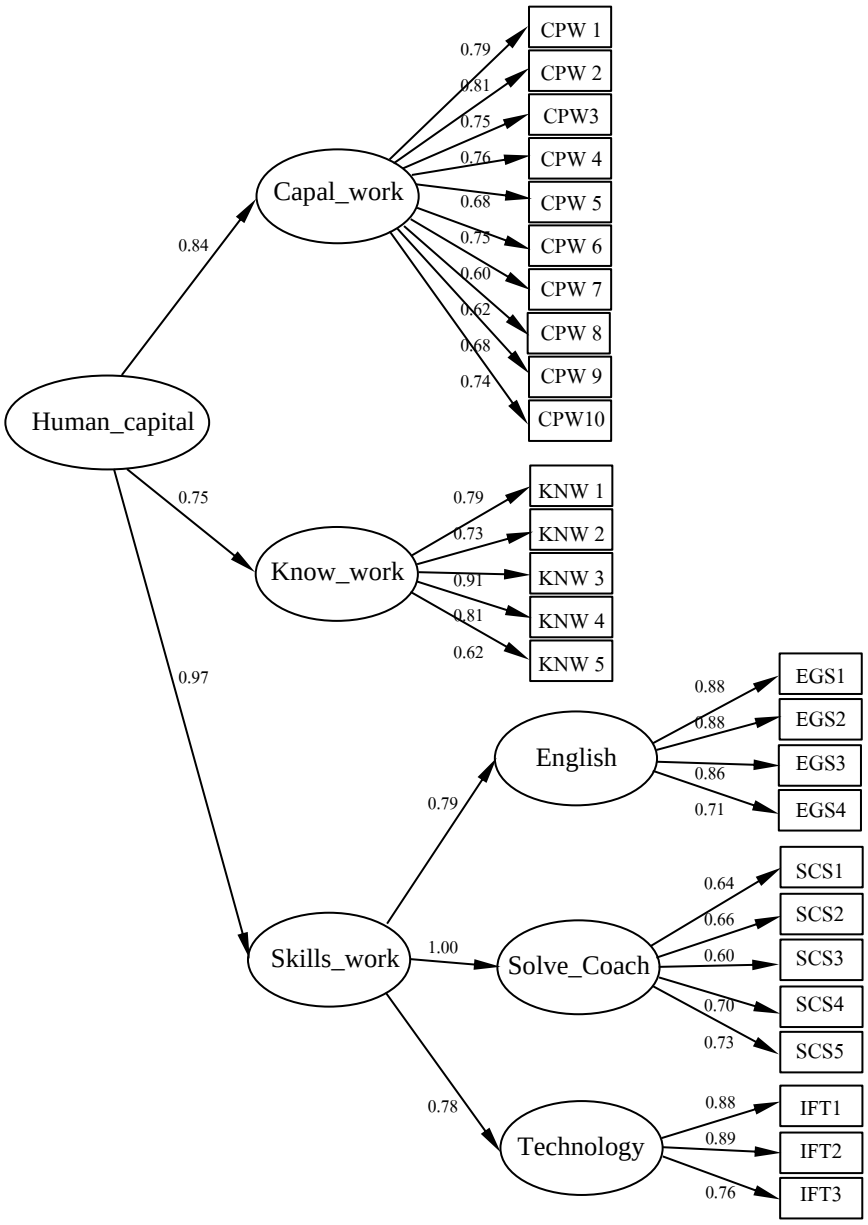
3.3 Information technology skills is measured by 3 indicators consisting of using computer program to enhance working efficiency (IFT1); using internet network for work (IFT2); and applying technology and a part of technology in production process (IFT3).

Data analysis

The researcher processed the data from the questionnaires using the confirmatory factor analysis (CFA) method.

Results

This research aims to analyze the components of human capital of production supervisors in vehicle parts manufacturing in the EEC, the researcher proceeded to the CFA method. The results of the CFA of human capital component of production supervisors in vehicle parts manufacturing in the EEC is displayed in Figure 1 and Table 1



x^2/df = 2.00, CFI = 0.95, GFI = 0.86, NFI = 0.90, TLI = 0.92, RMSEA = 0.07, RMR = 0.02

Figure 1 Human capital component of production supervisors in vehicle parts manufacturing in the EEC

Table 1 The result of CFA of human capital component

Variables	Factor loading (β)	S.E.	t-value	R^2
Human capital				
Working capability (Capal_work)	0.84*	-	-	0.70
Working knowledge (Know_work)	0.75*	0.11	8.61	0.56
Working skills (Skills_work)	0.97*	0.14	8.18	0.93
x^2/df = 2.00, CFI = 0.95, GFI = 0.86, NFI = 0.90, TLI = 0.92, RMSEA = 0.07, RMR = 0.02				

* significant at the 0.05 level (t-value > 1.96)

According to Figure 1 and Table 1 showed the results of CFA of human capital of production supervisors in vehicle parts organizations in the EEC, goodness of fit between human capital model and empirical data is found that the value comprises of x^2/df = 2.00, CFI = 0.95, GFI = 0.86, NFI = 0.92, TLI = 0.92, RMSEA = 0.07 and RMR = 0.02. The model fits with empirical data. The CFA of human capital of production supervisors in vehicle parts organizations in the EEC includes working capability (Capal_work), working knowledge (Know_work), and working skills (Skills_work), which are divided into 3 components including English skills (English), problem-solving and coaching skills (Solve_Coach), and information technology skills (Technology). The research found that the component weight of human capital is in a positive range of between 0.75 and 0.97 and has a statistical significance of the 0.05 level. This implies that all the components can be utilized to explain the human capital of production supervisors in vehicle parts organizations in the EEC at a significant level of 0.05. Each component weight is arranged in order from highest to lowest, including working skills with a component weight of (β = 0.97), working capability (Capal_work) with a component weight of (β = 0.84) and working knowledge (Know_work) with a component weight of (β = 0.75) respectively. Thus, working skills (Skills_work) has the highest predictor coefficient of (R^2= 0.93), reflecting that working skills are best explaining about human capital of production supervisors in vehicle parts organizations in the EEC with an explanation capability of 93%. Secondly, working capability has a predictor coefficient of (R^2= 0.70), which can explain the human capital of production supervisors in vehicle parts organizations in the EEC with an explanation capability of 70%. Lastly, working knowledge has a predictor coefficient of (R^2 = 0.56) which can explain the human capital of production supervisors in vehicle parts organizations in the EEC with an explanation capability of 56% respectively.

When considering the dimension of working capability (Capa_work) with 10 observed indicators, it is found that all the indicators have a positive component weight in a range between 0.60 and 0.81 and a statistical significance of the 0.05 level. It is said that 10 indicators are able to explain working capability at a statistical significance of the 0.05 level which managing yourself and responsibility efficiently (CPW2) has a highest component weight (β = 0.81, R^2 = 0.65) and with an explanation capability of 65%. When considering the dimension of working knowledge (Know_work) with 5 observed indicators, it is found that all the indicators have a positive component weight in a range of between 0.62 and 0.91 and a statistical significance of the 0.05 level. It is said that 5 indicators are able to explain about working skills at a statistical significance of the 0.05 level which remembering and understanding workflow details and standards (WKN3) has a highest component weight (β = 0.91, R^2=0.83)

with an explanation capability of 83%. When considering the working skills dimension with 3 indicators including English skills, problem-solving and coaching skills, and information technology skills, it is found that all the indicators have a positive component weight in a range of between 0.78 and 1.00 and a statistical significance of the 0.05 level. It is said that 3 indicators are able to explain working skills at a statistical significance of 0.05 which problem-solving and coaching skills (Solve_Coach) has a highest component weight (β = 1.00, R^2=1.00) with an explanation capability of 100%.

Discussion and Conclusions

Human capital is considered to be an essential asset of the organization that plays an important role supporting the organization's development and achievement [22]. Human capital is an important component to increase the working effectiveness of both the organization itself and its employees. It also helps the employees feels more satisfied with their output and the organization to have an advantage over its competitors thanks to the implementation of knowledge, skills, expertise and capabilities that are accumulated through education, training and development or previous working experience to elevate working effectiveness [23]. However, this research focuses on the human capital components of production supervisors for the vehicle parts industry in the EEC who play the role of a link between top managers and lower-level managers. Besides, a production supervisor's job description is planning and controlling production to achieve defined goals. Accumulation of knowledge, capabilities, and skills is an important factor in the enhancement of working efficiency and effectiveness. According to the study, human capital of production supervisors in vehicle parts organization in the EEC can be divided into three elements which combines working capability, working knowledge and working Skills. In terms of working skills, these include English skills, problem-solving and coaching skills, and information technology skills. The study also found that problem-solving and coaching skills are the most important skills for production supervisors in vehicle parts organization in the EEC, which correlate with the study conducted by [18] showing that problem solving skills are one of the most essential skills needed for the Thai workforce, especially for those at the management level who work closely with employees. They also have power to control and supervise the operational employees so that they can achieve the set goals, tackle problems that happen, and provide useful advice to the employees at the same time. In addition, work coaching is another essential skill to have the work achieved effectively since the purpose of coaching is to give employees advice, techniques and proper working procedures for the utmost successful performance [19]. Moreover, a human capital component that is essentially similar to problem-solving and coaching skills that production supervisors in vehicle parts organization in the EEC should possess is working capability, which is in correlation with Phuwittayapan's revelation that working capability is a desirable behavior that the supervisors should have [21]. This is because the supervisors should get involved in decision-making and take responsibility for initiating working procedures, resource management and working standards inspection [24]. Other than that, having in-depth understanding through the complex problems that can have an impact on an organizational overview will lead the organization to achieve the set goal and help adapt itself internally to imminent changing circumstance [5]. However, management, supervisor or employee level should learn and develop their skills and capabilities in a larger scale in order to uplift the human capital efficiency inside to work more effectively and reach the goal which can help make the organization grow in the future.

Suggestion

According to the research output, working skills have the highest component weight of 0.91, which is the first essential factor for production supervisors to work effectively. Therefore, the organizations should focus on improving skills of employees especially in terms of problem-solving and coaching skills that all the employees need in order to contemplate different types of issues and make a proper decision to tackle them. The employees also have an opportunity to recreate new working methods to enhance working effectiveness, transfer data, coach and negotiate work-related issues in order to improve working effectiveness to achieve the set goals. Meanwhile, the organizations should also place emphasis on working capabilities since the weight of this component is marked at 0.90, making it the second essential factor for production supervisors. Organizations should improve the capabilities of employees especially in terms of understanding change that affects company performance or corporate image and self-management and work responsibility. Besides, the organizations should develop the capabilities of employees in term of production planning management, activities to support production process and quality, activities to reduce production costs, teamwork compatibility, as well as strict observance of rules, discipline and regulations of the organization, self-learning and new knowledge acquisition, timing and work life balance management to make the workflow more effective. Besides, the research shows that working knowledge has the lowest component weight of 0.71 but organizations should also focus on this component since it has an impact on employee working performance. All the employees need to remember and/or understand core product details, working instruments, workflow details and standards as well as the product details and standards.

Further research

In order to cover every aspect of this topic for the sake of employee performance improvement, further study of the connection between human capital and performance of employees may be useful.

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