

**THE COOPERATION BETWEEN PUBLIC AND PRIVATE
SECTOR IN PROVIDING WORKFORCES AND DEVELOPMENT
OF LABOR EFFICIENCY IN THE INDUSTRY SECTOR**

The seal of Mahidol University is a large, faint circular emblem in the background. It features a central five-tiered umbrella (parasol) with a flame-like base, surrounded by a circular border containing Thai script. Four small floral motifs are positioned at the cardinal points within the border.

SONGVUT CHANAPAI

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT
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THE DEGREE OF DOCTOR OF PUBLIC ADMINISTRATION
(PUBLIC POLICY AND PUBLIC MANAGEMENT)
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY**

2017

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Thesis
entitled

**THE COOPERATION BETWEEN PUBLIC AND PRIVATE
SECTOR IN PROVIDING WORKFORCES AND DEVELOPMENT
OF LABOR EFFICIENCY IN THE INDUSTRY SECTOR**



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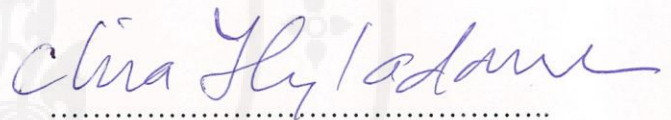
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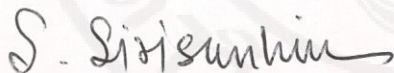
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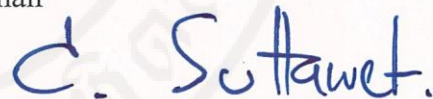
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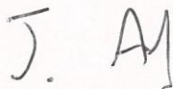
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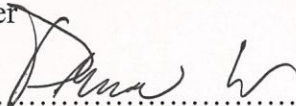
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THE COOPERATION BETWEEN PUBLIC AND PRIVATE SECTOR IN PROVIDING WORKFORCES AND DEVELOPMENT OF LABOR EFFICIENCY IN THE INDUSTRY SECTOR

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ABSTRACT

The main goals of this research were to analyse the situation and problems of public-private cooperation in providing workforces and development of labor efficiency in the Thai motorcycle manufacturing industry and to provides suggestions and recommendations for a new model of public-private partnership (PPP) in line with workforce demand and national development. Data were collected from a literature review, in-depth interviews with 26 key informants, and three focus group discussions with 24 selected experts from concerned public and private sectors. A questionnaire was used to collect quantitative data from 400 human resource officers and chief/upper level of production and quality of eight motorcycle manufacturers in Thailand as samples. Quantitative data were analysed using frequency, percentage, means and standard deviations, while qualitative data was assessed using content analysis.

Results revealed that developments in providing workforce and labor efficiency improvement were linked to the national development plan and operated under the national education plan. The private sector has provided education for the workforce since the launching of education reform in 1999. Currently, diverse types of cooperation operate under several committees. Operational problems and continuity reflect the low level of labor efficiency. A quantitative analysis found that job performances of people with vocational education were at the least and moderate levels while those with bachelor degrees were also at the low and moderate levels. A future appropriate model regarding the cooperation between the public and private policy and management as a PPP should be utilised to set up a new model of agency/institute consisting of concerned public agencies, experts in engineering and management from the industry, academics and domestic investors, aimed at creating a roadmap and national plans for developing the motorcycle manufacturing industry, relevant curricula, manpower and investment plan. Evaluation of the roadmap and report must be executed and the results achieved must be also reported to the country's leader.

KEY WORDS: PUBLIC-PRIVATE PARTNERSHIP / WORKFORCES /
LABOR EFFICIENCY / MOTORCYCLE MANUFACTURING INDUSTRY

342 pages

ความร่วมมือระหว่างภาครัฐและเอกชนในการเตรียมกำลังคนและพัฒนาประสิทธิภาพแรงงานในภาคอุตสาหกรรม

THE COOPERATION BETWEEN PUBLIC AND PRIVATE SECTOR IN PROVIDING WORKFORCES AND DEVELOPMENT OF LABOR EFFICIENCY IN THE INDUSTRY SECTOR

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาสภาพการณ์ ปัญหา ข้อเสนอแนะ และความร่วมมือด้านการเตรียมกำลังคนและพัฒนาประสิทธิภาพแรงงานในอุตสาหกรรมการผลิตจักรยานยนต์ของประเทศไทย และรูปแบบความร่วมมืออย่างใหม่ระหว่างภาครัฐและเอกชน เพื่อเตรียมกำลังคนและพัฒนาประสิทธิภาพแรงงานให้สอดคล้องกับความต้องการของตลาดแรงงานและการพัฒนาประเทศ โดยศึกษาข้อมูลจากเอกสาร การสัมภาษณ์เชิงลึกโดยคัดเลือกผู้ให้ข้อมูลแบบเฉพาะเจาะจง จำนวน 26 คน การสนทนากลุ่มโดยคัดเลือกกลุ่มตัวอย่างจากภาครัฐและภาคเอกชนที่เกี่ยวข้อง 24 คน และใช้แบบสอบถามเชิงปริมาณเพื่อเก็บข้อมูลสนับสนุนด้านประสิทธิภาพแรงงานจากกลุ่มตัวอย่างที่เป็นเจ้าหน้าที่ฝ่ายทรัพยากรมนุษย์ และเจ้าหน้าที่ระดับหัวหน้าควบคุมการผลิตและคุณภาพของบริษัทผู้ผลิตจักรยานยนต์ในประเทศไทย 8 บริษัท จำนวน 400 คน วิเคราะห์ข้อมูลโดยใช้ ค่าความถี่ ค่าร้อยละ ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน ส่วนการวิเคราะห์ข้อมูลเชิงคุณภาพใช้วิธีวิเคราะห์เนื้อหา

ผลการศึกษาพบว่า พัฒนาการการเตรียมกำลังคนและพัฒนาประสิทธิภาพแรงงานมีความเชื่อมโยงกับแผนพัฒนาเศรษฐกิจและสังคมแห่งชาติ ดำเนินงานภายใต้แผนการศึกษาแห่งชาติ โดยภาคเอกชนมีส่วนร่วมจัดการศึกษาและเตรียมกำลังคนอย่างเป็นรูปธรรมตั้งแต่ปฏิรูปการศึกษา ปี 2542 ปัจจุบันมีรูปแบบความร่วมมือและคณะกรรมการที่หลากหลาย แต่ยังคงเกิดปัญหาการดำเนินงานที่เป็นรูปธรรมและต่อเนื่อง ซึ่งผลการวิจัยเชิงปริมาณ พบว่า ระดับความสามารถในการปฏิบัติงานของผู้จบอาชีวศึกษาอยู่ในระดับน้อยที่สุด-ปานกลาง และผู้จบปริญญาตรีอยู่ในระดับน้อย-ปานกลาง แนวทางการกำหนดนโยบายและการจัดการภาครัฐด้วยรูปแบบความร่วมมือภาครัฐและเอกชนที่เหมาะสม คือจัดตั้งองค์กร/สถาบันร่วมภาครัฐและเอกชนรูปแบบใหม่ที่มีการลงทุนร่วมกัน (PPP) ประกอบด้วย หน่วยงานภาครัฐ ผู้ทรงคุณวุฒิด้านวิศวกรรมและบริหารจากบริษัทผู้ผลิต นักวิชาการ และกลุ่มทุนในประเทศ เพื่อกำหนด Roadmap และแผนพัฒนาอุตสาหกรรมจักรยานยนต์ของประเทศ พัฒนาหลักสูตรและบุคลากร แผนการลงทุน และการประเมินผล Roadmap และรายงานผลโดยตรงต่อผู้นำประเทศ

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CHAPTER I

INTRODUCTION

1.1 Background and Significance of the Problem

1.1.1 Overview and Human Capital in Thailand

The basic principles of development potential of a country for sustainability are based on the Human Resources in that country, especially in increasing the Human performance and efficiency of all of the population. As a result, the country will definitely have more opportunity to be competitive in the global economic system (The National Reform, 2015). Therefore, the process of improvement of the Human Resource performances, capabilities and high quality standards in professional careers in terms of the manufacturing sector and the service sector have contributed to the increase of the productivity in this country, particularly in the knowledge-base of the Thai citizens was included, similar to the developed countries such as Japan, Korea or Singapore (Thailand Development Research Institute Foundation, 2008).

In the year 2014, the total number of the labor force aged 15 years or older was approximately 38.4 million people, representing 59 percent of the total population of Thailand. In the past ten years (since 2004), Thailand's labor force has increased at a rate of 7.64 percent. In addition, the rate of employment or percentage of employment compared to the number of the labor force in Thailand was increasing and represented 97.23 percent as well as increasing to 98.35 percent in the year 2014. Meanwhile, the past ten years of unemployment compared with the labor force was decreasing from 2.07 percent to 0.95 percent consecutively. This indicates that the Thailand's labor market improved (Ministry of Industry, 2015).

However, the evaluation in the year 2014 showed that Thailand's labor market has begun to suffer unemployment problems. The unemployment rate was increasing by 28.17 percent compared with the year 2013. In the year 2014, the

unemployment number was 322,680 people. Meanwhile, in the year 2013, the unemployment number was 283,520 people (The National Statistics Department, 2016). Furthermore, the number of labor force was decreasing by 2.18 percent compared with the year 2013. The number of labor force showed that the employment was 38.1 million people in year 2014 and 38.9 million people in year 2013. (The National Statistics Department, 2016) Currently, Thailand's economy has stable growth; therefore, a large labor market is required (Ministry of Industry, 2015).

In the current labor market situation in Thailand, the trends of the industrial sector show that overall Thailand is now experiencing a labor shortage in the Industry sector. However, the rate of unemployment is increasing. The reason is that the amount of foreign laborers increased and they were hired by the companies. The problems in this case were reflection of the structure and social values of the education system. Moreover, the education system has not been directed by or conformed to the industrial demands. In addition, the high popularity in Thailand has changed the educational direction from the vocational training to the university studies. However, if we compare the education ratio of the unemployment rate, it can be seen that the undergraduates have more unemployed than the vocational graduates. Besides this, the labor shortage factor in the industrial sector was similar to that of the service business sector. The employment rate is averaged higher than the industrial sector. The average salary was 17,623 baht/month and 10,968 baht/month, respectively. Therefore, the compensation from the service business sector is more attractive to those newly entering the labor force. Moreover, the main supporting reason is that Thailand's current situation is moving forward to the aging society, especially in the year 2030 when the country will completely become an aging society.

Presently, the labor force in the industrial sector in Thailand has approximately 6,184,926 people. These are divided by the professional criteria of the labor force with the following numbers: the labor in professional areas includes 1,102,464 people and the labor in production areas includes 5,082,462 people. Most of the labor force are working in the food products and beverages sector, with approximately 957,998 people, 571,607 people are working in the rubber and plastics area, and 519,220 people are employed in the automotive (including trucks) area. The majority of the labor force are part of the labor in the production area. In fact, the

main point regarding the labor market in the Industrial sector is that there is still a labor shortage in the production area, of approximately 34,717 people. The highest labor shortage is in the production of fabricated metal products, except the Machinery and Equipment Manufacturing with a labor shortage of approximately 6,482 people. Following this is the manufacture of clothing and apparel and the dressing and dyeing of fur, and the manufacture of food products and beverages. The labor shortage in the above areas includes approximately 6,421 people and 4,538 people, respectively. This signals that the labor shortage will have an impact on the entrepreneurs in the near future. Moreover, the production process will use advanced technology instead of the labor force in order to reduce the labor costs for increasing product quality. Therefore, the problem must be specifically concerned about the labor skill shortage. In the next five years, the industry expects that Thailand will face the labor skill shortage in the production area of about 290,604 people. Meanwhile, the skilled labor will become older and retire from the industrial sector in the near future. The labor shortage situation will be the first priority concerned. For the automotive industry, during five years (from 2015–2019), the automotive manufacturers and automotive parts manufacturers have demanded the labor force of about 63,025 people and increasing to 200,555 people. In the year 2020, Thailand's automotive industrial sector will expand the production to at least 3 million units, which will be an increase of 500,000 units from the current production. Therefore, they will require the labor force of about 200,000 people, including the engineers and operators. On the other hand, they will reduce the foreign labor that are working in the production area by approximately 120,000 people from the total labor force in the automotive industrial sector. However, the foreign laborers are mostly the unskilled labor; thus, the products and qualities will be below standard. This will have an impact on the costs (Smiti, 2015).

1.1.2 Summary of the Motorcycle Industry in Thailand

Actually, Thailand's manufacturing sector can generate the economic growth to be the second level when compared to the proportion with the GDP and this is followed by the service sector. This shows that the manufacturing is a special key driver of economic growth in Thailand, considering the proportion of the GDP and

employment (Chongvilaivan, 2011). Researchers of ReportsnReports.com (2014) have studied the global motorcycle market by market expectations and concluded that global demand for motorcycles increases 6% per year, and the amount may reach 138 million units in 2018. The expansion of the market will increase in the countries with major motorcycle markets, including Brazil, Indonesia, Thailand, the USA and Vietnam (PRNewswire, 2014) as well as China and India, where the rate is growing inexorably.

In Thailand, the government announced the public policy that the country needs to be the automotive manufacturing base (Hub) in the ASEAN Economic Community (AEC) by the year 2015 based on the Industry's Board of Investment (BOI) goal to promote investment (Chaimongkol, 2013). The operating results in the manufacture of motorcycles in Thailand had high potential by 2014, and Thailand's export of motorcycles was ranked seventh in the world (Thailand Board of Investment, 2015). In addition, the manufacture and export of motorcycles Thailand is also a manufacturing base. Moreover, the manufacturers responded to supply the demand for high domestic volume. The figures show the amount of production and domestic sales of the FAMI (Federation of ASEAN Motorcycle Industry). The production and sales of motorcycles in the country is ranked second in ASEAN, behind Indonesia (FAMI, 2015). According to demand from the domestic agricultural sectors, where farmers are the main consumers of motorcycles, it can be seen from the number of motorcycle sales, that they are forecast to rise or decline based on the Thailand economy and the global economy as well as commodity prices (Automotive Institute, 2012).

Thailand's development of the industrial production motorcycle sector can be divided into five periods with the first period (1964–1977) focused on imported parts for assembly, which in 1977 had a total capacity of 234,280 units per year with total employment of 1,104 people. The second period (1978–1987) began the manufacturing of parts in the country in 1980, with a total capacity of 338,000 cars per year, with a total employment of 2,293 people. In the third period (1988–1997), the production of critical parts for the motorcycle industry continued to grow at a high rate until it produced up to 1.6 million units and the rate of capacity utilization reached 90.4 percent in 1995, driven primarily by the demand for motorcycles both

inside and outside the country. In addition, during that time in Thailand, the Government issued the protection law to support manufacturing; therefore, the manufacturers were ready to support the expansion of demand. The fourth period (1998-2001) was a time of extending cooperation to the parts manufacturers. There were parts suppliers of all types appearing. In the fifth period, with the exports, research and development (R & D) in the year 2002, now in its fifth generation, this country became a manufacturing base for motorcycles in the region. Production for both domestic consumption and export in the full year of 2005 reached more than 1.3 million motorcycles (Automotive Institute, 2012). In 2015, the government studied the master plan and attempted to establish a project to produce electric vehicles in the country.

According to the potential production for domestic distribution and export of the motorcycle manufacturing industry of Thailand, it created the network with the other industries, especially in automotive parts, which were already a large manufacturing base in Thailand. Furthermore, motorcycle manufacturers and parts suppliers are interrelated to develop the innovations for the motorcycle industry, which is called the Backward Linkage Effect. Motorcycle production has contributed to and supported the production of components to the overall industry itself (Automotive Institute, 2012), and the government will focus on the development of the automotive parts industry, which is the strength of the country (National Reform Council, 2015). Moreover, it affected the growth of industrial production of motorcycles in Thailand as well. The government continuously explained that the raw material sources in Thailand will reduce the production costs, included the labor costs. Therefore, the development of labor skills will contribute to attracting foreign investment (Chaimongkol, 2013).

1.1.3 Employment and labor problems in Thailand

The labor force in Thailand can be divided into two large sectors as follows: the agricultural sector and the non-agricultural sector. The non-agricultural sector includes manufacturing, service and retail, and so on. Most of the employment in this current situation is in the manufacturing area. However, the employment conditions may be identified as some problems that have occurred as follows:

1. The conflict caused a large number of unemployed, while the industrial sector faced a labor skill shortage because of labor quality issues. Moreover, most of the labor force still suffered from a lack of language performance, information systems knowledge, creative thinking and innovation. Therefore, it was not possible to further fulfill support for the value added of the industrial sector (Pa-aem, annual meeting of the NESDB, 2014). In particular, human capital is focused on developing only technical skills and lacks development in other knowledge, such as leadership skills, management skills, computer knowledge or the other Soft Skills (National Reform Council, 2015).

2. The main secondary issue was that the skilled labor force did not meet the requirements of the industry due to the low quality of labor in Thailand. Also, labor productivity continues to lag behind some countries in Southeast Asia, for example, Singapore. The reasons were a result of the failure of the inconsistency of the education system and labor skills (Nguyen, 2015). The new labor productivity did not meet the demand and supply. The providers of the education sector were still not in compliance with the requirements as manufacturers should be, and this affected the government's budget. Furthermore, the lack of a quality educational system also did not match the new technology, therefore the labor forces were unable to develop their own performance to make new further innovations (National Reform Council, 2015). This was the main factor that directly impacted the labor force's skills and low labor productivity (Nguyen, 2015; National Reform Council, 2015).

3. The challenge of development of labor skills in the industry was an important point because the skills for the labor market in the industrial sector tended to be required subjects, particularly in secondary school and vocational school. At the same time, the laborers of capacity have not increased enough to meet manufacturers' demands. This was an important factor that had an impact on the labor shortage as well as the trend of being self-employed, especially in Vocational, Diplomas and higher (Pa-aem, annual meeting of the NESDB, 2014).

4. Liberalization in ASEAN affected the laborers' free movement in eight career fields including engineering, architecture, nursing, dentistry, medicine, accounting, exploration and tourism. The skills of these laborers supplied the potential and power to bargain with employers on wages, compensations and benefits.

Meanwhile, Thailand was faced and concerned with maintaining skilled laborers because it needed to be manufacturer-based in order to develop the country. Otherwise, the country will be confronted with the problems of an increasingly unemployed and inadequately educated workforce. This was the most critical issue in 10 factors that are the problems facing the businesses of Thailand (World Economic Forum, 2014).

Of the products exported to ASEAN, the five largest are fuel, appliances, plastics, automobiles and automotive parts. The majority of the products exported belong to the foreign companies, especially in the electrical industry, machinery, motor vehicles and parts. Therefore, these companies had an opportunity to move manufacturing to the other countries where lower capital than Thailand is needed (National Reform Council, 2015). This can be seen in the labor-intensive industries such as textiles, apparel, footwear, leather and jewelry (Ratanakumfoo and Thammapiranon, 2015).

5. Previously, Thailand had development of skills for the people who were both in the formal and informal education system. The Department of Skills Development, Ministry of Labour was responsible for training and upgrading the skills of the workforce through the labor standards courses together with the Ministry of Education and other agencies under the management of both vocational and higher education to further support the labor skills for the manufacturing and services sector. However, there is a lack of integration in order to develop the workforce's efficiency, consistency, direction, including how to create the network of the relevant authorities to support the needs of the industry and service sectors. The results did not improve the process of systematic development of skilled labor (National Reform Council, 2015).

6. Thailand continued to face the problems in the development of a skilled workforce, such as compensation that was not related to skill, lack of a clear career path and a workforce that were not able to develop skills themselves. There was reliance on migrant workers at all levels. Furthermore, the trends of the labor shortage are related to the population structure, which needs to be prepared to accommodate older workers (National Reform Council, 2015). Hence, Thailand needs to accelerate reform accordingly in order to enhance the capacity of the labor force in Thailand. Finally, the employment will be sustainable for the quality of the work in the future (National Reform Council, 2015).

1.1.4 The cooperation between Public and Private sectors to develop a skilled labor force

In the past several decades, the Government has made several changes to the concept and practice to develop policies and management in order to enhance the skills, knowledge and ability of laborers. They have varied the attempts to reform the strategies which are related to some of the ministries. The main ministries responsible are the Ministry of Education, the Ministry of Labour and the Ministry of Industry. The policy process started from the announcement of the policy to be enforced, and the policy implementation or re-arrangement of the agency bureau to improve the country's education system and curriculum to meet the needs of the labor market in the motorcycle industry. Moreover, the policy needed to further support the requirements and improvements to the capacity of government officers, such as providing scholarships to study both domestically and in foreign countries. The significant point of this government proposal was to improve the public policy to be further developed and modify the government agencies system as well as attempt to pursue the high technology. This case was in order to reduce the delays that have an impact on the development of public policy, including strengthening the services.

However, development of public policies have not yet been successful, particularly in the development of students' skill processes and the workforce. The reason was to ensure the public policies that are matched with and support the labor skills in the industrial sector. Although the government has determined the objectives that have been confirmed and ensured to provide the labor efficiency for the country's economic expansion, on the other hand, the result of this research study has shown that the development policies have not met the motorcycle manufacturer requirements. Therefore, the questions have occurred regarding whether the education system is able to develop the labor skills, even though the government has attempted to improve the education system or vocational systems that are focused on all students being able to work in the industry after completing their education. Furthermore, it is not clear whether the courses from the Department of Skill Development have had any impact on the labor skills. However, the development policies have not been achieved regarding these targets because they had a lack of the cooperation with the motorcycle manufacturers. The factors that can be inviting for the manufacturers to

participate with the government are (1) staff are trained to be knowledgeable, (2) training courses must be modern and matched with manufacturers' requirements, and (3) the cost of the training must be appropriate (Chanthaburi, 2547).

For the government policy that is related to the automotive industry, the focus is on the development of human resources in manufacturing, especially the strategy in cooperation among the government, the manufacturers and the universities. This is because they think that the cooperation will meet the needs of the industry in the future, so the achievement of tangible results must be promoted. However, the current education system has found that students have a lack of thinking skills and make little effort, therefore we need to encourage the students to take advantage of the opportunity to intern in the manufacturing field. This will allow the students to gain the experience and be ready to work when they have graduated (Phutrakhul, 2014). This is another significant aspect to be studied in order to develop and further improve it.

However, regarding the development workforce policy as mentioned above, is it still difficult to maintain for improving the workforce until presently? This is the question from the manufacturers.

In terms of the private sector, each company has its own way of development policy. According to the policy of the organization which is mainly focused on providing the basic programs prior to entering the manufacturing, the main responsibility is the Human Resources department for principle training of new employees for one week, who then move forward to the production area. The period of training in production is about three weeks. After that, all the associates will have the training in their job function. It called OJT (On-the-Job Training). Most of these training programs are specific with clear objectives. However, the government needs to study the details and guidelines from the private sector to see if there is any direction to develop the programs, how the account costs can be balanced compared with hiring associates, and how more skills can be given to workers who are hired after graduation into their own organizations and so on.

The causes of the development of workforce skills in the private sector are related to the concept of Human Capital in organizations (Schultz, 1971). For the purpose of improving the quality of work and increasing productivity, it is necessary to have investment related to education and training. For example, to resolve the

problems, the private sector created the agency's training manual. In addition, there was also the creation of groups or associations that are involved in the motorcycle area, such as in the automotive industry. FTI was formed by the merger of the manufacturers and operators of automobiles and motorcycles in the country. Established in 1976, it was one of the 43 industry groups in the Federation of Thai Industries. The purpose is to promote and disseminate research on advanced technical training and enhance the domestic industrial growth, and also be able to compete with foreign products. Furthermore, the Thailand Automotive Industry Association was established on July 15, 1981 as a "Private Institution". The roles and responsibilities were the center of Thailand's automotive industry. The vision was "a center for automobile production and parts with excellent quality in the world" and to enhance the competitiveness of the automotive and parts industry for sustainability.

Besides this, the results of the study of public policy and public administration are related to workforce development. Education policy and implementation of the private sector and the cooperation between the public and private sectors were also extremely important to study and create the concepts of both directions. Therefore, the government must implement the best public policy such as the education policy to develop the students or personnel before entering the field of manufacturing. Then, the quality of the workforce will allow the manufacturers to produce the best products. Moreover, the benefits will appear for the laborers, the manufacturers and the country. However, the government must be concerned about the public policies. Otherwise, the labor force may not be matched with the manufacturers' requirements, and it will difficult for the private sector to operate their business.

Since the former Prime Minister Prem Tinsulanonda conducted the cooperation between the public and private sectors, a "public and private council" has been founded with the purpose of developing the economy, trade and investment in the country. However, cooperation between the public and private sectors has been further developed for use in the management of various areas. The cooperation has continued implementation under the informal and formal areas. Notwithstanding, it also had unclearness and obstacles as well as the efficiency of the process, including the procedures to promote and strengthen the development of labor skills. From the past to the present, after the coup in 2014, the Human Development Institute was established in

the automotive and part suppliers industry in 2015. They have focused on strengthening and enhancing the workforce skills. In addition, current Prime Minister Gen. Prayut Chan-o-cha has attempted to continue enhancement of the cooperation between the public and private sectors in order to develop labor skills. However, it continues to be unclear regarding the industry goals and expectations. The reasons of the unsuccessfulness are related to frequent changes in the government leaders.

Therefore, this study of the cooperation between the public and private sectors has the significant purpose to develop the labor-oriented industrial fields. Therefore, for the reasons mentioned above, together with the manufacture of motorcycles in Thailand being an important asset in ASEAN and globally, this research will be conducted for the public and private sector to be able to study the development cooperation of the two sectors to improve labor efficiency in manufacturing for stability, sustainability and the benefit of meeting the targets for the country in the future.

1.2 Objectives

1. To study the progress of the educational policies and educational programs in creating the knowledge and skills of workforces before entering into the motorcycle manufacturing industry in Thailand.
2. To study the circumstances and problems of the cooperation between the public and private sectors in providing a skilled workforce to the industry supporting labor productivity in the motorcycle manufacturing industry in Thailand.
3. To develop policies and suggestion for public administrations in terms of providing a skilled workforce to the industry in developing an effective workforce as well as a collaborative model of the public and private sectors in the motorcycle industry in the future.

1.3 Questions

1. Do and how do the courses of instruction in educational institutions consistently meet the labor needs of the motorcycle manufacturers? How?

2. How do the Government, including government bureaus, and the private sector become involved in cooperation (Public-Private Partnerships) within organizations and between each other in terms of providing the skilled workforce to enter the motorcycle industry? What are the Format, Subject, Problem and Reason?

3. What kind of the cooperation between the public and private sectors within and between them in terms of developments in labor productivity and activity in motorcycle industry are formed? Can they affect the performance of laborers in the motorcycle industry? What kind of impact and problems have occurred and why?

4. What kinds of proper public policy and public administration of workforce preparations for the entry into the motorcycle industry, labor efficiency, and the cooperation of the private and public sectors within and between them are needed in the future?

1.4 Hypotheses

The cooperation between the public and private sectors has not developed an effective workforce to meet the needs of the motorcycle manufactures because of the following points.

1. Education to prepare the workforce for the motorcycle industry lacks management cooperation between the public and private sectors in an appropriate type. As a result, the knowledge and skills of the workforce do not match the motorcycle manufacturer requirements. This is impacted by the following items:

1.1.1 Industry has a labor skill shortage.

1.1.2 Preparation and workforce development in the country is slow to catch up with the growth of the motorcycle industry due to the lack of the quality of the cooperation between the public and private sectors.

2. Public policy and public administration to provide the development workforce skills have not been able to provide the consistent knowledge and skills that the motorcycle manufacturers require.

3. In the past to the present, the management of the cooperation between the public and public, the private and private and the public and private sectors to provide the workforce for the motorcycles industry have not been in the proper format, and thus it is necessary to change to a new management style in order to guarantee the availability of skilled labor performance in the motorcycle industry.

4. The management of the cooperation between the public and public, the private and private and the public and private sectors in terms of the future direction is the key to further success in preparing the workforce to meet the motorcycle manufacturers' requirements. They must be enhanced to drive the dynamics of the process of cooperation between them and keep their promises to implement policy together.

1.5 Scope of the Education Research

This research study is focused on research cooperation between the public and private sectors to provide the labor efficiency in motorcycle manufacturing. The scope of the content is divided into two types as the following:

1. To study the policy formation of the cooperation between the public and public, the private and private and the public and private sectors in preparing the workforce and workforce efficiency in motorcycle manufacturing by review of documentary data from the Education, Labor, and Industry ministries. Those are related to strategy planning and the master plan of each ministry. Moreover, the research needs to review the training programs from the Department of Skill Development that serve to train the workforce, along with each Ministry Act, and to study the practical concepts of the private sector related to influencing the development of labor skills, knowledge and capabilities, including the best format for the cooperation.

2. To evaluate the knowledge, skills or abilities of the workforce in the production and quality control areas, which are concerned with the employment

system in order to reflect on the policies and cooperation between the public and private sectors in terms of the development of labor productivity in the motorcycle manufacturing industry in Thailand.

1.6 Scope of the Agency Research

This research will study the data related to the collaboration between the public and private sectors in order to improve the labor efficiency in the motorcycle manufacturing in Thailand. Therefore, it will focus on corporate responsibility and relate to the development of knowledge, skills or abilities of workforce as below:

1. Agencies of the government that are responsible for developing and enforcement of policies in labor functions. The purpose of the management is to strive for concrete action and evaluation of the policies of the Ministries of Education, Labor and Industry.

2. Agencies of the private sector are divided into 2 types as follows:

- 2.1 Thailand consists of eight companies, namely Thai Honda Manufacturing Co. Ltd. Thailand, Yamaha Motor Thailand Co., Ltd. Thai Kawasaki Enterprise Co., Ltd., Thai Suzuki Motor Co., Ltd., BMW Thailand Co., Ltd., Ducati Thailand Co., Ltd., and ATV Panther Co., Ltd.

- 2.2 The National Organizations are namely the Federation of Thai Industries and the Thailand Automotive Industry Association.

- 2.3 Union Organizations are namely Congress of Labor, Trade Union Congress, Labor Unions of motorcycle manufacturers and Employers' Confederation

1.7 Scope of the Timeline

1. Research involving the data and information collection was conducted from March 2017 to May 2017.

2. The scope of the research data that is studied is from the term in office of the former Prime Minister Gen. Prem Tinsulanonda to that of the current Prime Minister Gen. Prayut Chan-o-cha.

3. Scope of the research has specifically studied the motorcycle industry from 1977 until May 2017.

1.8 Benefits

1. To know the conditions of the preparation and process of the development of labor productivity in the motorcycle manufacturing in Thailand.

2. To determine the issue of cooperation between the public and private sectors in preparing the workforce and labor efficiency in the motorcycle manufacturing in Thailand.

3. Recommendations of the public policy and public administration are related to providing the skilled workforce and development of labor efficiency, and to create a new more appropriate cooperation between the public and private sectors (Public Private Partnerships) in the motorcycle industry in the future.

1.9 Definitions

Government agency means the agencies which are related to the Industry, Labor and Education Ministries.

Private sector means the motorcycle manufacturer in Thailand, the Thailand Automotive Industry Association and the Federation of Thai Industries.

Labor means the people who are working in motorcycle manufacturing, and are aged over 18 years old.

Industry Sector means the motorcycle manufacturers in Thailand.

Development Efficiency means development of knowledge, performance, skills and expertise of the workforce

Efficiency means the quality of education that will enable the workforce to work according to the industry targets.

Performance Evaluation means an assessment by the public and private sectors that can be used to measure the capabilities of workforces.

Course means the type of education in vocational institutions and universities that are related to the motorcycle industry.

Public Policy means the Law, National Economic and Social Development Plan, Labor Master Plan, Industrial Development Master Plan, National Education Master Plan, Government Policy, and Rules and Regulations.

Public Administration means the Strategic planning, action plans, projects, educational activities and workforce development activities.

Private Policy means the Production Strategic Plan and Human Resources Development Strategic Plan.

Private Administration means the Strategic Planning, Management and Control Plan, and Human Resources Evaluation Plan.

Master Plan means the National Economic and Social Development Plan, Labor Master Plan, Industrial Development Master Plan, Automotive Master Plan, National Education Master Plan, Education Reform Plan and Draft Education Reform Plan.

Government Authority means Staff to the Permanent Secretary

Private Officer means Permanent staff to Top Management (the President) in the motorcycle manufacturers in Thailand.

Cooperation between the Public and Private Sectors means the types of various cooperation that are intended to achieve the preparation of workforce efficiency targets.

Quality of Cooperation between the Public and Private Sectors means the services of the preparation of the workforce and the development of knowledge and performance within the contract.

Standard Score means the level of employees' job performance with a mean score range is between 2.61–3.40

CHAPTER II

LITERATURE REVIEW

This research is a study of the collaboration between the public and private sectors in preparing the development of workforce efficiency in various Industry sectors. The researcher will present the literature that is related to this research and divide these topics into the following items:

2.1 Concepts of Public Policy Development

2.1.1 Development Policy

2.1.2 The cooperation between the Public and Private Sectors on development in Public Policy.

2.2 Concepts and theories related to the cooperation of the public and private sectors

2.2.1 Intergovernmental Relations Theory

2.2.2 Intergovernmental Management Theory

2.2.3 Inter-organizational Relations Theory

2.2.4 Cooperation and Partnership Theory

2.2.4.1 Public-Private Partnership Theory

2.2.4.2 Triple Helix Model

2.3 Human Resource Development Theory

2.4 Concepts and Theories related to Efficiency

2.5 Summary of review of the theories and Theory Analysis

2.6 Summary of review literature

2.7 Synthesis of review related research

2.8 Research Framework

2.1 Concepts of Public Policy Development

2.1.1 Policymaking

Public Policy is anything that the government chooses to act upon or not act upon (Dye, 2013). Basically, there are two aspects of public policy: (1) explains the nature of the policy type and (2) a description of the policy implementation type (Bowornwattana, 2009).

Policymaking is required for the creation of a framework to resolve the issues that will be forwarded to the government. The Government can select a solution, conduct further evaluation and revise their decision again (Sabatier, 2007).

Policy process is involved with the process of developing policies regarding “how policy can be developed”, which is classified into activities, known as the “process” that occurs in the system of political governance (Dye, 2013). The policy process includes the following activities:

Process	Activity	Participants
Problem Identification	Publicizing societal problems Expressing demands for government action	Mass media Interest groups Citizen initiatives Public opinion
↓	↓	↓
Agenda Setting	Deciding what issues will be decided, what problems will be addressed by government	Elites, including president, Congress
↓	↓	↓
Policy Formulation	Developing policy proposals to resolve issues and ameliorate problems	Candidates for elective office Mass media
↓	↓	↓
Policy Legitimation	Selecting a proposal Developing political support for it Enacting it into law Deciding on its constitutionality	Think tanks President and executive office Congressional committees Interest groups
↓	↓	↓
Policy Implementation	Budgeting and appropriations Organizing departments and agencies Providing payments or services Levying taxes	Interest groups President Congress Courts
↓	↓	↓
Policy Evaluation	Reporting outputs of government programs Evaluating impacts of policies on target and nontarget groups Proposing changes and “reforms”	President and White House staff Executive departments and agencies Independent agencies and government corporations
		Executive departments and agencies Congressional oversight committees Mass media Think tanks

Figure 2.1 Policymaking Process

2.1.2 The Cooperation between Public and Private Sectors on Development in Public Policy

The Public-Private Partnerships in Thailand, (Office of National Economic and Social Development) are the beginning of an effort to organize and coordination mechanisms between the public and private sectors. The significant approach is to encourage the private sector role and participation in developing the country. At that time, the cooperation established the “Joint Public and Private Sector Consultative Committee” in 1981 during the term of office of the former Prime Minister Gen. Prem Tinsulanonda. A significant contribution was to promote trade and investment by the private sector in the country (Government House, 2015). The cooperation of both sides was to establish another committee that was responsible for resolving the national economic issues by the Cabinet on June 30, 1981. This committee had the Prime Minister as Chairman and assigned the project to the Office of National Economic and Social Development NESDB as the secretary. The Committee consisted of the Ministers of Economic Affairs and concerned with the heads of government agencies. The Committee was composed of representatives from the three institutions, with the private sector represented by the Thai Chamber of Commerce, the Federation of Thailand Industries (FTI), and the Association of Banks.

The cooperation mechanism has been extended to the region. The Interior Ministry is the central agency to coordinate this. The minister serves as the president of policy recommendations, guidelines and measures in terms of troubleshooting and economic development in the provinces.

Afterwards, the plan was included in the National Economic and Social Development No. 5 (1982–1986), which emphasized the role and mobilized the participation of the private sector.

The Significance of the Joint Public and Private Sector Consultative Committee’s Role

Initial Phase: Prime Minister General Prem Tinsulanonda gave top priority to the development policy process. The Conference Board was held every month; therefore, the implementation was continually proceeding, and the significant contribution is substantial for three reasons:

1. Preparation of a joint project between the public and private sectors, including the establishment of the Energy Center and Credit Guarantee Scheme for SMEs as well as the declaration of the years 1987–1988 as "Visit Thailand Year", cooperation to prevent and solve environmental problems, and so on.

2. Amendment of the rules and procedures of the state in order to facilitate and to provide more convenience for the businesses in Thailand, such as the establishment of a center for investment by the Department of Industry, improvement of the regulations and administration of taxation revenue, levying of VAT instead of business tax, etc.

3. Issues to be considered included the establishment of a sector fund for export development, development of shipping freight and maintenance, workforce development to encourage investment in the Business sector, and so on.

Internal Roles

1. The working committee, which was expanded nationwide, and a representative from the private sector participated in the formulation of a national strategic plan, such as collaboration with the private sector represented by the Department of Commerce, the Ministry of Science and Technology, and the Ministry of Education, plus the National Committee of the Board of Investment, the Board to develop the Eastern Coastal Area, the Board of Freight Services and the Commission to develop Economic Cooperation with Neighboring Countries. In addition, the Private Committee appointed state representatives to participate in the composition of the board of the private sector, such as the Economic Development Committee, Board of Trade of Thailand. Academic the Board of Academic of Federation of Thai Industries.

2. The proposed strategy and policymaking: the Private Sector offered a Strategic Development Plan that included an important economic development strategy of the Chamber of Commerce in Thailand, the development of sustainable industrial society plan of the Federation of Thai Industries. The industry and the community economic development approach based on the concept of sustainable urban development and industrial ecology (Eco-Industrial Town) were presented as the strategies of the industry.

3. Delivery from the government tasks to act on their behalf. The private sector has also helped to reduce the state's workflow due to the private sector being able to achieve fast service, such as product standards. The Ministry of Commerce announced the assignment to the Board of Trade of Thailand, and they have given the certification standards to entrepreneurs.

4. Corporate Social Responsibility (CSR) codes of conduct and corporate governance (Good Corporate Governance) have been used by the private sector for the management focused on fairness, transparency and high standards of performance. The corporations are involved with increasing the reliability to ensure that businesses are concerned with society. The project's Q-Mark logo is more effective to represent the standards of manufacturers, traders and service providers.

In addition, public and private cooperation mechanisms have also played a role in driving the development of the country, related to the workforce, employment and performance. Moreover, it also resolved the unemployment problem. The impact of enforcement was The Labor Protection (No. 2) Act 2008, Section 11/1. The results of the Seminar on "The professional qualifications of Thai Labor to international" included opinions on the draft regulations of the Ministry of Labour relevant to the employers or owners of enterprises and government agencies who have been disabled to work. In addition, it is concerned with the amount of the requirement to pay into the fund, promote and improvement of the quality of disabled persons live.

International Cooperation Roles

1. ASEAN Framework

- Established the ASEAN Chamber of Commerce and Industry (ASEAN – CCI) and the ASEAN Business Advisory Council (ASEAN BAC), the responsibilities are to reflect the private sector's opinions and recommend how to increase the cooperation and enhance the economic integration of ASEAN.

- Has reflected on the comments of the private sector and proposed that cooperation is vital to support and drive the economic integration of ASEAN.

2. A framework for economic cooperation in the sub-regions (GMS/ ACMECS/IMT-GT)

- Established the GMS Business Forum: Pushed forward to facilitate cross-border trade and empower SMEs
- ACMECS Business Council: Pushed forward to promote the industrial cooperation at cross-border areas and contract Farming
- IMT-GT Joint Business Council (JBC): Focused on cooperation to enhance competitiveness and bargaining of agricultural products (Non-members).

FTA

- The private sector also has a strong role in helping the government to push Thailand to negotiate a free trade area (FTA), both before and after the final discussion.
- Before negotiations, the private and public sectors will hold discussions together in a Focus Group for each industrial cluster. Thailand intends to jointly define and assess the advantages in various fields.
- The negotiations are scheduled to discuss remedial measures and the monitoring and evaluation of each cluster.

Progress of cooperation between the public and private sectors in order to develop the workforce

Regarding the establishment of a Joint Public and Private Sector Consultative committee to resolve the economics problems in the year 1981 during the term of office of former Prime Minister Gen. Prem Tinsulanonda, the committee performed various methods. The purpose of the committee was to develop the country. In this case, workforce development can be summarized briefly as seen in the following table.

Table 2.1 Cooperation between Public and Private sectors : Development of Labor Skills

Type of Cooperation	Action	Government Action/Year	Government Agencies/Private sector
Dual Vocational Education System	The Professional Education Management has established by agreement between Vocational, School and Institute with Government Agencies Manufacturers. Most of the students had taken some courses in school and learned the operations utilized in manufacturing. (Office of Vocational Education Commission, 2557)	Started in 1984 Progress is divided into 4 steps 1. The project of School with Manufacturers (Dual System) during 1984–1994. 2. The project of Dual Vocational System during 2538–2541 BE 3. Practical Training Program (50:50) during 1999–2007 BE 4. Dual Education System 2008–Present	- Vocational Education Institute - Manufacturer voluntary participants
Cooperative Education	The study was made jointly between the university and manufacturers. Focus on the experience and gained from the industry. It is called “Work Based Learning” or “Work Integrated Learning: WIL”.	Started in 1993, Established by Suranaree Technology Institute and expanded by	- Graduate Institute - Manufacturer Public: Commission on Higher Education

Table 2.1 Cooperation between Public and Private sectors : Development of Labor Skills
(cont.)

Type of Cooperation	Action	Government Action/Year	Government Agencies/Private sector
Cooperative Education (cont.)	The project will help the graduated students to understand the knowledge, technology that is provided by the manufacturer program. The Skill Development Promotion Act 2002. It will be entitled to the benefits of the tax laws.	The Commission on Higher Education. Developed in the year 2002 as a pilot project and spread operations Nationwide until now. This project has developed into an international cooperative education.	- Ministry of Education, Ministry of Labour and Revenue Department <u>Remark</u> Results are expected to be the intimate relationships between industry and academia. In addition, participating in the curriculum can create the interdependence of information, knowledge, technology and utilization of human resources, both adaptive and efficient partnership or stakeholders. (Commission on Higher Education, 2009)

Table 2.1 Cooperation between Public and Private sectors : Development of Labor Skills
(cont.)

Type of Cooperation	Action	Government Action/Year	Government Agencies/Private sector
Joint Public and Private Sector Committee on Workforce Production and Development Planning	The cooperation between the public and private sectors was under the process of joint committee to study the needs of development workforce skilled to meet the needs of the country, and contribute to the national wide and enhance competitiveness was under the operation of the Office of the Education Council as Secretary to the Board of Directors. Moreover, the committee has prepared a strategic manufacturing and workforce development of the country during the second decade of education reform in the 2009–2561 BC. The Strategy consisted of nine strategies. (Office of the Education Council, 2011)		- Thailand Travel Trade Association - The Office of the National Economic and Social Development. - Office of the Basic Education Commission - Office of the Higher Education Commission - Office of the Vocational Education Commission - Federation of Teachers and Education - Council of University President of Thailand - Council of Rajabhat University President - Council of Rajamangala University of Technology - Association of Private Higher Education Institutions of Thailand - The Association of Private Technology and Vocational Education College of Thailand - The Medical Council of Thailand - The Lawyer Council of Thailand - The Dental Council of Thailand - Thailand Nursing and Midwifery Council - The Pharmacy Council of Thailand - Architect Council of Thailand - Council of Engineering - Federation of Accounting Professions - Council of Science and Technology Professional - Franchise & Thai Business Association - The Association of Thai Software Industry - Thai Logistics and Production Society - Thai Garment Manufacturers Association - Thai Gem & Jewelry Traders Association - News Association of Thailand - Thai Broadcast Journalists Association - Thailand Development Research Institute Foundation - Office of the National Primary Education Commission

Table 2.1 Cooperation between Public and Private sectors : Development of Labor Skills
(cont.)

Type of Cooperation	Action	Government Action/Year	Government Agencies/Private sector
Automotive Human Resources Development Academy (AHRDA)	Established by Industry Requirements. The AHRDA has received support and fund from the Ministry of Industry from Japanese Government. The purpose needed to cooperate with Vocational School and Manufacturer in terms of development skill of instructor in Development of Skill Development and Vocational School, which is related to the Automotive Industry.	Established by the Cabinet in 3 Sep 2013 and opened on 2 September 2015 under the recommendation of the Development of Skills Development Committee	- Ministry of Labour - Ministry of Industry - Vocational Education Institute - Manufacturer - Federation of Thai Industries
Joint Public and Private Sector Committee on Development student in Vocational Education	The cooperation between Public and Private has focused on development the workforce skilled in terms of Quantity and Quality. Furthermore, in September 2015, the Committee has established the sub-committee 27 working groups to encourage the resolve the problems. The Sub-committees were as follows: 1. Information and Technology system Group 2. Textile, Garment and Fashion Group	On October 2013, the Ministry of Education has Announced that consisted - Minister of Education - Office of the Vocational Education Commission - The Association of Private Technology and Vocational Education College of Thailand - Office of the Basic Education Commission - Office of the Non-Formal and Informal Education - Office of the Education Council - Office of the National Economic and Social Development -Ministry of Industry - Ministry of Commerce - Ministry of Labour - Department of Agricultural Extension	

Table 2.1 Cooperation between Public and Private sectors : Development of Labor Skills
(cont.)

Type of Cooperation	Action	Government Action/Year	Government Agencies/Private sector
	3. Tool And DIE Group 4. Agricultural Group 5. Civil Engineering Group 6. Electric and Electronic Group 7. Merchant Marine Group 8. Logistics Group 9. Tourism and Hotel Group 10. Gem & Jewelry Group 11. Auto Service Group 12. Energy Group 13. Franchise Group 14. Small Automotive Engine Group 15. Services Group 16. Petroleum and Chemical Group 17. Automotive Spare Parts Group 18. Plastic Group 19. Industrial Estate Group 20. Air Conditioning Group 21. Printing and Packaging Group 22. Machinery Cluster Group		- The Revenue Department - Teacher Professional Development - The Thai Board of Investment (BOI) - The Thai Bankers Association - Office of Small and Medium Enterprise Promotion - Federation of Thailand Industry - The Thai Chamber of Commerce (TCC) - Tourism Council of Thailand - Industrial Estate Authority of Thailand (IEAT) - Famer Group Organization - Local Administrative Organization

Table 2.1 Cooperation between Public and Private sectors : Development of Labor Skills
(cont.)

Type of Cooperation	Action	Government Action/Year	Government Agencies/Private sector
	23. Northern Professional Group 24. North-East Professional Group 25. Southern Professional Group 26. Research and Development Group 27. Framework and Planning Group		
Public-private steering committee; Public-Private-Civil (Pracharat) Working Group on Basic Education and Leaderships (the 4 th team) and Working Group on Competitive Workforce (the 11 th team)	Established for driving country to become a high-income country. Divided into 12 working groups. The Committee has focused on 4 pillars by the following item; 1) Good governance 2) Innovation and productivity 3) Development of human capital and 4) Wealthy (Rohistient, 2559)	The Cabinet has acknowledged on 15 December 2015 and also established the sub-committee 12 teams 1. Enhance innovation and productivity team Public Leader: Minister of Science Private Leader: SCG 2. Investment and Infrastructure Team Public Leader: Minister of Transportation Private Leader: Bangkok Bank 3. Small and Medium Enterprise Promotion team Public Leader: Deputy Minister of Commercial Private Leader: Chairman of Federation of Thailand Industry 4. Competitive Workforce team Public Leader: Minister of Education Private Leader: SCG Development Basic Economic and Community team Public Leader: Minister of Interior Private Leader: Thai Beverage Public company	

Table 2.1 Cooperation between Public and Private sectors : Development of Labor Skills
(cont.)

Type of Cooperation	Action	Government Action/Year	Government Agencies/Private sector
		Tourism and Meetings, Incentive Travel, Conventions team Public Leader: Minister of Tourism Private Leader: SCG 7. Export and Foreign Investment Team Public Leader: Minister of Commercial Private Leader: Sri Thai Superware 8. Development Cluster of Future Industry team Public Leader: Minister of Industry Private Leader: PTT Global Chemical 9. Review and Revised Regulation and Public Re-Engineering team Public Leader: Deputy prime minister Private Leader: SCG 10. Development Agricultural team Public Leader: Minister of Agriculture Private Leader: the Mitphol Public Company 11. Basic Education and Leaderships team Public Leader: Ministry of Education Private Leader: CP Public Company 12. Enhance Income and Expenditure team Public Leader: Ministry of Finance Private Leader: Central Group	

2.2 Concepts and theories about the cooperation of the public and private sectors

The cooperation of the public and private sectors can offer theoretical approaches involved in two main issues:

- 1) Inter-governmental Relations Theory

2) Inter-organizational Relations Theory, Public-Private Partnership and Triple Helix Model

Both of the theories are related to the human resource development theory. Therefore, to contribute and increase the efficiency of the workforce to meet the objectives of this research, the relationship between the indicator and theories can be shown as below:

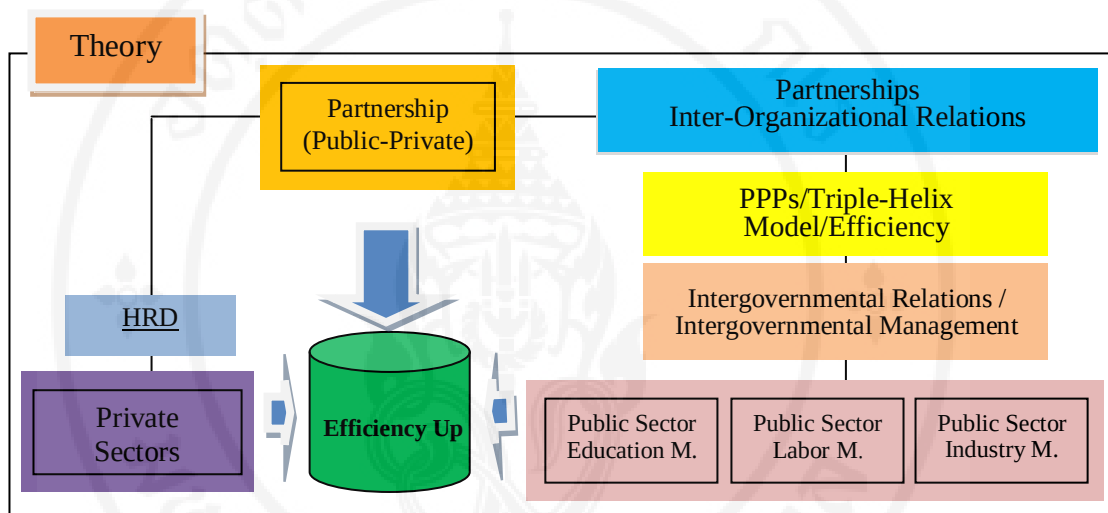


Figure 2.2 The Relationship between the Indicator and Theory

2.2.1 Intergovernmental Relations Theory

Intergovernmental Relations or the relationship between one government agency and another government agency can be viewed as two-dimensional: 1) vertical relationship and 2) horizontal relationships. In the past, this theory referred to the relationship between the main government agency of the country and the secondary-level government agency. After that, it was focused only on the relationship between the secondary-level government agencies. It can also be divided into two levels, 1) formal and 2) non-formal. First, a formal relationship is determined by the constitution or specific laws. Second, an informal relationship is a relationship based on fact (Wongpredee & Sudhipongpracha, 2013).

Intergovernmental Relations, or IGR, cover the relationships between governments at all levels such as local with national, state, or Federal District with

State and Local, or between Local with Local as well. Wright's views (Bowornwattana, 2002) on four issues include the evolution of the IGR and IGR indicators of attitudes and behavior in the workplace, including financial. Moreover, in terms of the IGR relationships, Wright viewed the attitudes and behaviors are based on the position or the leader in government, and summarizes that the characteristics of the IGR in the United States of America have various formats:

1. State and federal government is separated independently. (rarely seen)
2. State and local governments are under the control of the national government.
3. The national, state and local governments are in a close relationship. However, the relationships among them are characterized by bargaining and interchange as well as cooperation or conflict.

In addition, the evolution of IGR has three forms, which might have centralizations in the national government or be highly decentralized or develop in a gradual manner with no more power and more decentralized (Wright, 2000). All three models show a strong correlation between local, state and national government with three types of relationship: 1) comprehensive, 2) coordinated, and 3) overlapping of authority (Koliba, 2012).

2.2.2 Intergovernmental Management Theory

Intergovernmental Management (IGM) has not yet been unified, but often there were important elements such as changes in social structures, social relations, fiscal responsibility, significant changes in the model of activities. Furthermore, there was the important think that they concerned about the modification of policy or directions of public services. In other words, the IGM was a structured system of policies and projects that focused on innovation in management to maximize efficiency in government services. (Deil S. Wright and Carl W. Stenberg, 2007)

Moreover, the IGM is focused on applied policies to effective practices amid the diversity of government organizations and the many relationships and finding how to manage of each government agencies work together. The implementation of the policy to achieve success requires mutual understanding or exchange to associate each government agencies (facilitating cooperation via exchange) to maximize the objectives of the policy. (Laurence J. O'Toole, Jr., 2003)

2.2.3 Inter-organizational Relations Theory

Inter-organizational Relations Theory is concerned with the relationship between one organization and another organization or organizations. Zanko (1995) has classified the process of interaction of the organization with another organization into five main processes, included Coordination, Cooperation, Collaboration, Competition and Conflict, which can be explained as follows:

1) Inter-organizational Coordination : The process has been given the most attention in studies. The empirical evidence from many studies has found that it is a key aspect of public administration and delivery service. Meanwhile, the initial study focused on how to improve the partnerships between organizations. It also provided specific education in the partnerships between the non-business sector and non-governmental organizations. Furthermore, it can be defined as the two organizations or more organizations that have already set the principles or rules to work together. These principles or rules may be determined by the participating organizations operating together or managed by external organizations such as federal or state organizations, etc.

2) Inter-organizational Cooperation : It is defined as the cooperation of organizations that have considered and created the objectives for the joint action to accomplish the goals. However, the relationships types differ on the basis of the five main criteria: 1) rules and regulations, 2) goals and activities, 3) relationships both vertical and horizontal, and 4) human resources and the barrier of operating independently.

3) Inter-organizational Collaboration: This is a process in which the parties are involved with different aspects of the problems and determines how to fix the problems within the constraints of vision using a process that analyzes the opportunities and problems. The cooperation and participation in the process is one of cooperation, which is called Collaboration.

4) Inter-organizational Competition: This is a process in which the researchers have paid little attention to study when compared to the previous three models. Most of the economists have used it with a competitive relationship between the organizations and how to develop one's abilities.

5) Inter-organizational Conflict : The principles are quite diverse in terms of opinions in the organization and the others. Therefore, the conflict is not always a negative factor, but it can be help organizations to improve.

Also, Zanko has identified patterns of relationships in organizations (Model of Inter-organizational Relations). These can be divided into 4 types:

Dyads: This type of relationship between the organizations is the basis of the transaction or interaction of multiple formations that took place under the twinning of the two organizations. While this relationship can form a variety of dimensions, such as formal and more intensive; however, there are no data to show the environment arising from the bilateral links.

Organization Sets: The organizations have come from the corporate center that acts more directly linked to the organization, or organizations that make a difference to the organization by asking questions. This relationship type will ignore the relationships that occur outside the very center.

Action Sets: A group of organizations that form a temporary alliance for the limited purpose. The Organization Sets had a different type of this Action Set because of the relationship between all the members. The Action Sets are not in the corporate center but the group will act as a hub.

Networks: The relationship can be described in four aspects as follows:
1) To determine the problem, 2) Defining the Network, 3) Direction content, and
4) To conduct a multi-level analysis.

2.2.4 Cooperation and Partnership Theory

2.2.4.1 Public Private Partnership Theory

Public Private Partnership Theory (PPPs): The theories of public and private partnership are well known as a powerful tool for creative projects in the infrastructure of the country, and also include the export development strategy. Furthermore, the energy exploration, the public transport and even large scientific research projects all involve the government and the private sector. However, the social context of sustainable development in terms of the partnership between the public and private sectors is a rare occurrence. Nevertheless, it is becoming more prevalent today. This suggests that a new paradigm of cooperation (New Paradigm for

Collaboration) will occur very quickly in development country. The PPPs are an innovative solution to the corporate and financial requirements arising from the intention to support government agencies to provide services to meet the needs of the people. PPPs will be used in the cooperation of a joint legal contract. They will be concerned with risk, responsibility and profits (if any) between the government and the private sector. In addition, PPPs also require strong collaboration from the two sectors (World Economic Forum, 2014).

Schaeffer and Loveridge (2001) explained that the government often forces the private sector. This combination was the expectation of something in return and risks of participation can affect patterns of cooperation in different ways. They also divided the forms of public-private partnerships into four formats as follows:

- (a) Leader-Follower Relationships
- (b) Exchange Relationships (Seller-Buyer Relationships)
- (c) Joint Ventures
- (d) Partnerships
 - (1) Limited Partnerships
 - (2) Full Partnerships

The model presented is consistent with the pattern of cooperation including the three types of McGuire: Policy/strategy making, Resource exchange and Project based, which can be explained by the following format:

- (a) Leader-Follower Relationships

Relationships between leaders and followers: This pattern of behavior is a relationship of collaboration that often happens in this kind of trial and error situation, rather than the result of negotiations between the parties. Furthermore, it can be in the form of contracts or agreements between stakeholders, especially those involving a difference of the power or resources. This cooperation is very well known for being used worldwide in which the government is the leader and followed by the private sector or opposite side.

- (b) Exchange Relationships (Seller-Buyer Relationships)

Exchange relationships are relationships between buyers and sellers. This pattern is often associated with the transactions between the government

and the private sector. Although both parties receive benefits from the operation, there is still an element of competition between the parties. In this relationship form, the private sector is often represented as the buyer. The community or government competes to perform the new businesses and job creation. It is the seller. However, the government may not always be a seller. The private sector may be the seller such as providing facilities to the community or region. There are various cases where the private sector provided a public service and supplies the relationship Exchange (Exchange Relationships). Both of the parties must be concerned about closely working together. Additionally, in many cases, the private sector is responsible for the quality of services, while the government will act as hearing complaints from the community.

(c) Joint Ventures

Joint Venture: This pattern of relationship is a joint venture of investment. The pattern is very useful for two or more parties that expect to gain the benefits from the collaboration. Meanwhile, they can be independent of each other at the same time, which is similar to the collaboration of Project Based pattern of cooperation of McGuire. This pattern was established for the special objective and it is very difficult to change it. This means that the format will be set by the companies. The previous collaboration of the process of decision-making between both parties was more complex than the usual “Joint Venture” because the government could not exercise power directly. Therefore, the combination in terms of “Joint Venture” is high efficient for the important projects to create the benefits for the community. However, this pattern needs the government support that is involved with the government’s projects.

(d) Partnerships

A partnership relationship: The influence of the legal definition in terms of “Partnerships” means this relationship pattern is a mutual agreement to work without end. The partners will set general objectives of cooperation, but will open new opportunities for cooperation and development cooperation activities in line with this policy (Policy/strategy making of McGuire). The partnership will mutually benefit all parties, with decisions and risks fully included in the activities of the joint partnership, which is why it called a “Full Partnership”. The various types of “Limited Partnerships” that bear the risks and the rewards are not

quite equal. This will be determined together in order to reduce the budget that they have agreed upon. However, this partnership must have at least one partner with unlimited liability.

Shaeffer and Loveridge's conclusions regarding the types of cooperation can be summarized as in the following table as below:

Table 2.2 Type of the cooperation

Significant Points	Leader-Follower	Buyer-Seller	Joint Venture	Partnerships
Purpose	There are specific trends such as investment funding to develop a residential area	Limited and specific such as searching the new business	Limited and specific such as the construction and / or management facilities	Generally open and no limitation such as strategic planning to develop a residential area
Decision-Making	Leader is independent but dependent followers	Collective bargaining and competitiveness	Cooperation Participate and equality in collaboration	Participate and equality in collaboration
Rewards	Each income	The distribution is based on the strength of the market. (The target when negotiating)	A participate and a strong correlation between the return of the participants	Participate and strong correlation between the returns of the partners
Risks	Each income Limited Collaboration of each other	Each income The distribution is based on the results of the operation and strength of the market (The target when negotiating)	Together and un-often. The risk depended on the agreement. Limited	Together. The distribution is un-accurate. The cooperation is very strong. Limited

Table 2.2 Type of the cooperation (cont.)

Significant Points	Leader-Follower	Buyer-Seller	Joint Venture	Partnerships
Formal Agreements	Depending on the size of the investment required of a leader. Short-term or long-term (Mostly short to medium term). Limited	Depending on the complexity of the transaction. The relationship of exchanging individual rather limited. However, the objectives are quite receptive and not infinite. Short to medium term Depending on the complexity of the transaction.	Yes, Limited, Receptive Medium to long term, depending on the complexity of the project	Yes, Receptive, Long-term

Tansen (2012) explained that Public-Private Partnerships (PPP) is a model developed for cooperation between the private sector (private companies, NGOs, groups or business associations) and the government (such as the Ministry of Education and/or the director of the ministry itself) that have the knowledge, expertise and resources together to achieve the goals of development. The cooperation together has created the criteria such as the objectives, activities, roles and responsibilities. If considering the aspects of market forces, the public-private partnership (PPP) would be a network between education and employers. It was a term to define the scope of the public policy framework, system funds and education framework that are shared between the executive management and employers. Patterns and methods of PPP are quite diverse. The format can be a formal and clear organization or informal and flexible. The cooperation of the government is involved in the training of the private sector. On the other hand, the private sector is involved in the training provided by the

government. The joint action of cooperation between the institutions or the interaction between internal government agencies is implemented in preparing the policy framework of PPPs.

Linder (1999) explained that the theory of partnerships between the public and private sectors are different concepts. This includes the concepts of neoliberalism (Neo-liberalism) and conservatives (Neo-conservatism) with a different interpretation, causing the adoption of different theories in the context of social and economic structures. For Thailand, the partnerships between the public and private sector are in the implementation of neoliberal ideas (Neo-liberalism), which are used as a marketing tool (Natthapong Phuensaen, 2553).

Meanwhile, Chan and Müller (2012) propose concepts related to the emergence of three theories, including the Partnerships.

(1) Functionalism: In point of view of functionalism is created for the requirements of management needed in the institute.

(2) Policy Network Theory: It can be seen as an emerging of network policies. Moreover, the network policy may mean how to apply this theory to produce the economic model that has the relationship between all actors of the public and private sectors intending to create the new policy.

(3) Institutionalism: This theory is considered for the individual and common benefits, and it is the purpose of the concept to create the acceptance in the organization. Moreover, it will be to expect the lost and profit of the cooperation between government agencies and the private sector. However, Simon has found that the rationality of people is limited because there are still emotions and irrationality at that time. This can be applied to the organizations and the institutions as well. For that reason, the researcher agrees with Simon in terms of the process of rationality. It must be carried out carefully, otherwise it will reflect the conflict of interests in a group or the stakeholders. Finally, the objective will not achieve to the goals. Thus, this became the origin of the word “corruption” and damaged the people and the nation, which is regarded as a real obstacle. The examples were obvious, such as the Hopewell Project, etc.

Moreover, in the view of Pattberg, Biermann, Chan and Mert (2012) it can be seen that the Public-Private Partnerships are a national policy that has

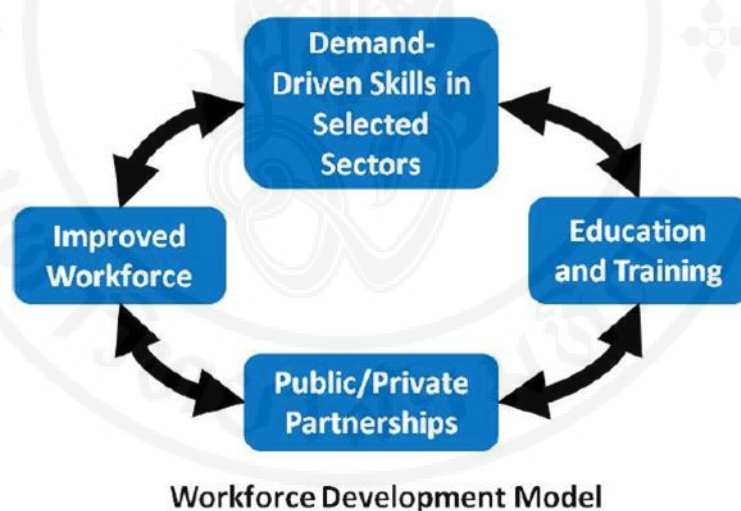
been focused on particular health infrastructure and services to rural areas, and the interest in the international public and international relations began at the start of the year 2000. Initially, the “Public-Private Partnerships” were presented as a tool to increase the efficiency of the state, which is a form of modern public management (New Public Management). In the early 1980’s, due to the traditional public administration being focused on the strict control, compliance and routine of each day without causing innovation and flexibility, it brought this style to the old-fashioned methods as the cause of the loss of resources and effectiveness. Therefore, “Public Management” was established and enhanced to increase the efficiency and productivity in the government sector.

Nevertheless, Huque and Conteh (2014) provided information that despite the studies and literature about “Public-Private Partnerships” were a rapidly increasing in number, but the confusion regarding the definition and concept of “Public-Private Partnerships” was still present. Since the early 1990’s, the Public-Private Partnerships have been presented as a tool for multilateral policies with good governance, and legal, effective solutions to the deadlock of the negotiations between the governments of the countries. The Public-Private Partnerships have both occurred within countries and between countries, which is related to the combined management from the government to prepare the product. This means that the transfer of an authority’s command from the government and the relevant departments of the government to the private sector such as the business industry, NGOs, etc.

The roles of PPPs in industry and academia have been studied by Dunbar (2013). At present, PPPs are used in describing a consortium of industry and academia, which usually involve the public funds for the purchase of training services from the private sector to expand the development of official skills. In some cases, the private sector has made an agreement to be responsible for the affairs instead of the government. However, in the case where a consortium of industry and academia is involved with the strategy and activities such as those providing the professional standards, management training institutes and development of training courses, in this context, the government often is being driven by the private sector to join voluntarily. The private sector will be less likely to join it because the benefits do not occur within a relatively short period. Nevertheless, the powerful support must

come from the private sector, especially in terms of the workforce skills development. The acquisition workforce is another role with which the private sector must be involved, although in the past, PPPs were often involved in infrastructure projects, using financial support from the private sector to build various facilities for the public, in this context, the private sector will remain in the database if it is not driven. Although, at least it is a voluntary partnership.

The forms of PPPs do not follow just one pattern. They can be formed for various solutions. In the context of skills development, a PPP is a pattern of public policy and the capitalist system, and thus, the common goal is to strengthen the communication among the education policy makers, universities and industry. The format is shown in the diagram below:



Source: Public-Private Partnerships: lessons learned (USAID/Jordan, January 2009)

Figure 2.3 Skilled Workforce Development Model of Public Private Partnerships

The researcher agrees with the studies as mentioned above that all key factors will strengthen the intellectual capacity and drive the performance for the workforce. Therefore, the private sector must play a role in increasing both the technology skills and management skills, included with research and development programs. All of achievements that the private sector accomplished were pioneer projects for the development of business and the economy of the country. Therefore,

it is essential that the private sector participate in the transfer of innovation-oriented knowledge to the workforce through cooperation and joint management of the two parties. However, in Thailand the current situation is that programs under collaboration occur rarely, especially in the automotive sector, even the cooperation to develop skills and expertise in testing the performance of the vehicles or investing in the Automotive Technician Institute's auto sector, etc.

Format for the participation of the private sector

The private sector can be involved in developing a variety of skills (Muriel Dunbar, 2013) as follows:

1) Global Inter-Sectoral Partnering (ISP) in skills development

The participation model is a combination of multinational companies, International Institute Government agencies and civil society. The purpose of recruiting is for the development of the economy such as providing workforces with the highest skills, improving the quality and potential, enhancing a policy of social responsibility and as part of a public relations organization. The private sector may participate as follows:

- Participation in the Joint Committee, or as Secretary or the other
- The practical training and learnership programs that provide students with establishments to learn the skills that the industry needs and learn how to function in a social workplace.
- Mentoring and career counseling
- Technology and equipment
- Sitting in on classes and meetings
- Participating as an expert
- Business Networking
- Fixtures for entrepreneurship, innovative business plans
- Lending to invest in the business
- Operational or technical

- The workforce skills need assessment, or Evaluation of the labor market, or Training of NGOs or other sectors to perform various tasks.

- Design or operational activities of social marketing

2) Partnering on National Strategies in Skills Development

The role of the business sector in the country and the local potential do not vary with the multinational organizations. They can provide the specialists, funding and support technology for skills development. In addition, many countries have plans for the business sector to participate in developing strategic management and design skills together with the government, for example, report preparation strategy for lifelong learning conducted by representatives of the private sector. Most of businesses sector is focused on the importance of the involvement of employers to communicate their policies to develop their employees' skills in various fields. The businesses sector, for example, must provide the Management training programs, and the education and training to meet the needs of the labor market, support and promote lifelong learning, and improve the educational and training systems together with the evaluation system respectively.

3) Partnering for Implementation of Skills Development

The environment was not conducive to private sector involvement in the development of national strategy skills. The business sector was also able to develop the skills in a variety of ways. Mostly, the businesses sector will usually provide in the local area. The activities, which were related to the skill development, provided a joint management of the organization, training and skills for instructors, transfer of the knowledge of developing training programs and materials. Furthermore, the program will give opportunities to work (On-the-Job Training), and work experience in the workplace, as well as provide information, advice and vocational education, and ensure the quality of teaching and evaluation of students in various training in institutions. The relevant format can be implemented by all enterprises from large to small, and can be both formal and informal depending on the capacity of the operator. Moreover, it also depends on the willingness and skills of the employer and vocational education institutions to collaborate with more intent focused on the national economy. The relationships of the different partners are shown in the diagram below.

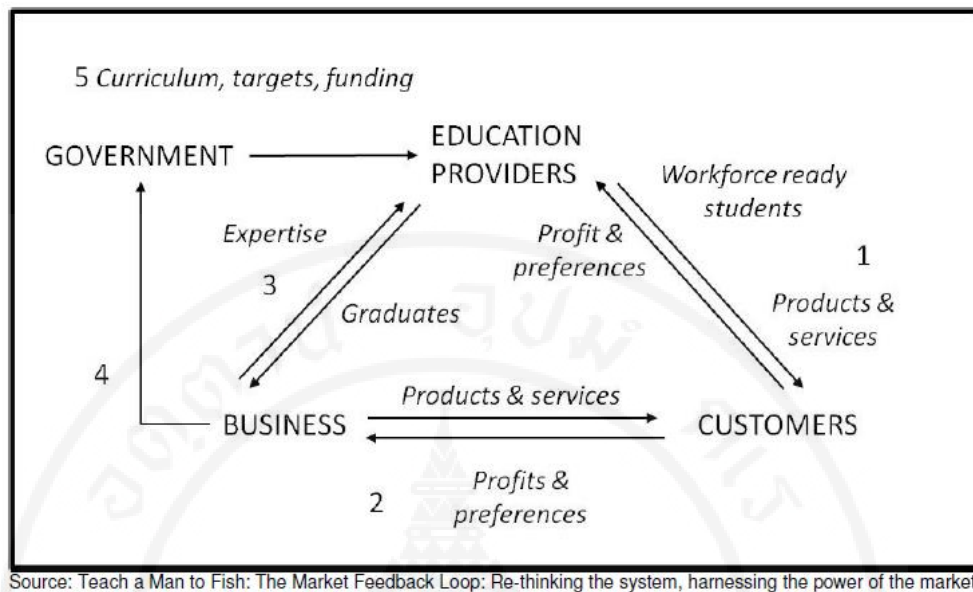


Figure 2.4 The Market Feedback Loop (Showing the Public-Private Partnerships in the Labor Market)

4) Informal Apprenticeships

As informal practical training often occurs in low-income countries such as the ILO projects (International Labor Organization)

5) Involving private sector training providers

As a result of the management of the public sector alone not being able to satisfy the needs of the growing professional skills of the students, the governments want to increase this support by providing training services from the private sector, however, issues of quality and sustainability will be compared with the context of the benefits organizations received training, which is based on market mechanisms.

Greve and Hodge (2011) recently expressed the viewpoint that a Public-Private Partnership (PPP) is a key part in the development of government policy. However, to make the issue of PPPs into the evolution of NPM with a clear understanding, there was still a small number. But in general, PPPs can be defined broadly as a mix between the agencies and institutions, government agencies and the private sector together. Moreover, interest in PPPs increased during the years 1990 to

2000. The debate on PPPs was to be part of the evolution of the post-NPM and NPM (Post-NPM agenda). Currently, PPPs comprising NPM oriented requirements are fragmented and the competition of authorities is motivating. It also included provisions in the Post-NPM, such as networking and collaborative government.

However, Jumhol Nimpanit (2548) looked at PPPs as a result of the reforms, the government played a role only as specifically responsible to provide the service to people. At the same time, the government has opened an opportunity for the people, communities and the private sector to increase their role in order to reduce the aspects of the government process, for example, provided public services, investments and business services, transport and communications, support for diversification in the region, education management, primary health care development, and development of labor skills. The researcher agrees with the idea of reforming the government's management, namely the NPM model is a tool to help and encourage to reduce the problem of the overlap between the roles and responsibilities in organizations. For example, the overlap in organizations occurred when providing the curriculum of instruction of the Ministry of Education or the Ministry of Labour to prepare and develop a skilled workforce to meet the needs of the labor market. Moreover, the Skill Development Institute assigned to the private sector, particularly to prepare the course of development of labor skills because the private sector was more knowledgeable in the technology than a government. However, cooperation between the public and private sectors found that there was no tangible progress to achieve the targets, but it was more likely with the development of more partnerships such as the establishment of Skill Development Regional 1 in Samut Prakan province. Moreover, some time may be required to evaluate the project's success, including with the continuing of the project. This was partly the result of a lack of continuity in the development policy of the authorities that are responsible for formulating policy and leading to the action plan. This theory is on the lack of continuity in policy processes or Incrementalism from "The Science of 'Muddling Through'" of Linblom (1959) as well.

In addition, Osei-Kyei and Chan (2015) proposed that a Public-Private Partnership (PPP) is defined by the researchers in a variety of ways and practices, which differ only slightly. The implications of PPPs are that the expertise and management skills of the private sector have been hired to serve the

basic structure of the government. Therefore, the government could focus on the other sectors, especially in the development of infrastructure and growth in the country. The main principles of PPPs are to spread the risks between the partners and also a partner with the relationship between the public and private sectors for over 10 years, so the stability of relationship is needed for successful implementation. Furthermore, the consortium may also bring their resources and materials, or increase stock as well. In the development of PPPs in the 19th century, it can be found that various types of PPPs were used such as Build–Operate–Transfer (BOT), Design–Build–Finance–Operate (DBFO), Build–Transfer–Operate (BTO), Design–Build–Operate–Maintain (DBOM), Build–Own–Operate–Transfer (BOOT), Operate and Maintain (O&M), Design and Build (DB), Build, Lease and Transfer (BLT), Design, Construct, Manage and Finance (DCMF), Design Construct Manage and Finance (DCMF) and many others with similar characteristics and patterns. These were used in many ways that were based on the economic circumstances of individual countries, especially in developed countries.

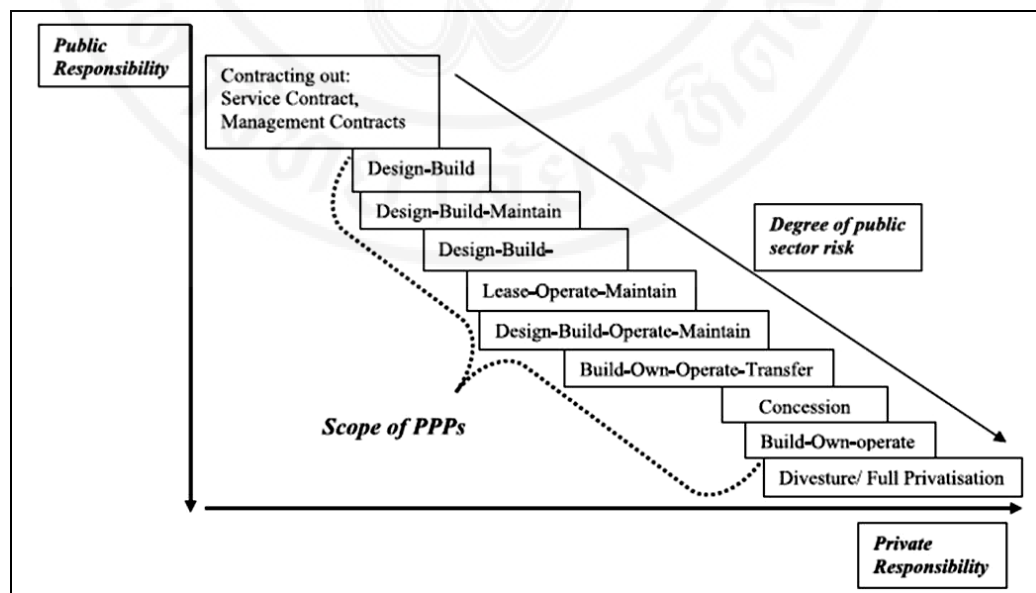


Figure 2.5 Proportion and responsibility of public and private sector (Roehrich, Lewis & George, 2014)

In addition to infrastructure and public services, in Latin America also has PPPs that are used in the manufacture, research and development (R & D) in agriculture (Hartwich and et al., 2007) for the purpose of agricultural development and to benefit the partnership of both sectors such as reducing the costs and risks of research, and helping to improve the quality and relevance of research and insurance. These have been selected by the user to offer potential skills and resources for sharing and high-level competition in the market. The goal of such cooperation is in order to reduce the poverty of the people. The implementation and management of knowledge and technology is provided to the various groups that are participating in this project.

For the context of the implementation of PPP was used in the study of Tansen (2012) who studied the subject “Public Private Partnership (PPP) in the Technical Vocational Education and Training (TVET) Sector in Bangladesh: Challenges and Prospects”. This research studied the policy context of a partnership between the public and private sectors in the vocational education sector and examined the current situation of the partnership or the other partners in the vocational education sector. Furthermore, the limitations or challenges in a joint partnership between the government and private sector of vocational education system were analyzed, including the suggestion of a strategy to strengthen the partnership between the public and private sectors in the vocational education of Bangladesh. The study indicated that the scope of the partnership between the public and private sectors are as follows:

- 1) The Government established the National Skills Development Council, which is chaired by the Prime Minister. The announcement of the practical application in the vocational education system should be followed by concrete action to drive the model by the tripartite representatives from employers, employees, and the government and civil society. Moreover, to strengthen the Office of the Secretary of the Council there was recruitment of individuals with the right capabilities and meetings of the Council on a regular basis. This will help to implement a public-private partnership in the vocational education, which is more effective.

- 2) The industry will have to manage the career guidance services and skills required and identify the core skills that are important for the

industry, and the Government and industry should continue to form a network of a tripartite council.

3) Professional services as a training instructor such as supplying textbooks and creative curriculums and the accreditation of educational institutions. These types of partnerships were particularly useful, especially in bringing the expertise of the private sector into the public sector.

4) Services Operations: Contracts to private enterprises to manage public schools, which will manage both the management and associates. The service is intended to form an independent school in the administration and coordinate the interests of parents as well as the community to develop the school. There were many communities to help with the building and developing of school facilities.

5) Education services in which the government paid for the students to study in private schools. This government did not have to invest in buildings and supplying equipment for teaching. In addition, some governments still directly paid for the students to study in private education for the alternative subjects that were not taught in the public school. The type of the services may involve providing scholarships or privilege cards.

6) Supply facility: The governments attempted to get the private sector to invest in many parts of the education sector. The private sector was providing facilities instead of the government. Therefore, the governments did not have to invest in a huge project at one time but the governments can pay in a long term under the contract.

7) Regarding the provision of facilities and education services, in some cases, the governments would provide contracts covering both the facilities and education services.

Soares (2010) explored the meaning of partnerships between community colleges and the industrial sector in the management of education, which refers to a type of cooperation between community colleges and businesses, chambers of commerce, or business associations. They had an objective by using existing resources in the community to create a course of study that is linked to the regional economic situation, the demands of the labor force, and meeting the labor market needs. The partnership can help the human resources, finance facilities, materials and

leadership in various areas depending on the objectives and outcomes. The keys to the success of the partnership based on Kisker and Carducci's concept was presented in the UCLA Community College Review with five reasons:

1. Aware of the challenges of economic development in the local and regional areas or need to pay attention to building up cooperation.
2. Create a vision and a common goal.
3. Ensure that the partnership will be valuable to all parties, Including students.
4. Utilizing strong leadership of the industry and colleges.
5. Drive the development process by good governance and accountability.

In addition, Soares also presented good practices of partnership between universities and the industrial sector as follows:

1. Changes in curriculum and instructional transformation by partners to create curriculum and instruction of a new type, including the content of courses and lessons. The course focused on the basic skills, how to graduate faster, and learn from the real workplace. The patterns of learning and working were created and developed by the employers.
2. Academic and social support: Partners can be provided with technical support and find jobs for the students, including the creation of short courses or support funding to the job center. Moreover, partners can be advised regarding financial, technical and professional assistance.
3. Professional development: Partners can be supported with resources for staff of community colleges to develop the specific skills to create new courses and teach both for an academics basis and for an adjusted career basis as well as track the progress of students and the needs of employers.
4. Sharing resources for sustainability: Partners can create new courses to develop the labor skills of the students.
5. Systemic institutional alignment and improvement: Partners can play a role in transforming the vision, strategic plan and management in the college.

In the context of labor, Arellano et al. (2008) studied the subject of Public-Private Partnerships in Labor Markets and proposed that PPPs are partnerships between the private and public sectors to achieve specific goals. In many cases, there were examples of PPPs in infrastructure, health and education, but in the context of the labor market very little showed. According to the study, it was found that Analysis of the economic situation stimulated and focused on PPPs in terms of labor. For economic reasons, the government was engaged in the labor market due to the failure of marketing and the demands of social equality, and the government was not able to give support to the labor force. Therefore, PPPs were an effective tool to correct the failure of management and marketing from the government services to the people. The way of understanding the operation of PPPs was to find the best type of PPPs that are achieved in developed countries. However, the combination of PPPs was also dependent on the national economic framework of the country as well.

In addition, Vertakova and Plotnikov (2014) have studied the subject of Public-Private Partnerships and the Specifics of Their Implementation in Vocational Education and found that the social-economic complexity increases have been influenced by the financial crisis. Therefore, it was necessary to call for a proper mechanism for the strengthening of regulations. This will lead to the solution to develop a relation of partnerships between government and private businesses. Also it was found that research on PPPs in the Russian labor market was highly desirable. The reason shown is that there is a shortage of training for people to have expertise, knowledge and the ability to put it into practice immediately. In addition to this, the potential of human resources in terms of educational professionals in Russia was indicated to be insufficiently strong. Therefore, it is a significant reason for the government to provide the public project to the people. Then, the government will invite the private sector to get involved with the development of PPPs to the enhancement the cooperation to develop labor skills for support of the growth of the economy.

Moreover, regarding the context of education and workforce development, Medhekar (2014) conducted a study of Public-Private Partnerships for Inclusive Development: Role of Private Corporate Sector in Provision of Healthcare Services, in terms of PPPs in the Public Health sector, it was found that hospitals need to have a role in managing PPPs for medical tourism. For example, the project has

supported the poor people with effective cost management and created innovative solutions for taking care of slums or rural villages in order to guarantee sustainability and comprehensive coverage.

It can be seen that the public and private sectors in various countries including Thailand have adopted PPPs to be used in the context of a wide range of national infrastructure and providing for a large public, which is the area that the governments have used PPPs to conduct training. Moreover, the development and application of the concepts and principles of PPPs in the research and development of agricultural, education, workforce development and public health in a new dimension has come up constantly as well. However, it may not also occur as a model or type of PPPs. The qualification of PPPs was to place the general principles of the policy to be applied to specific parties under the independence of institutions and actors involved in the operation alongside the independence of their original organization. The type of contracts and collective action can be defined under the laws and regulations.

2.2.4.2 Triple Helix Model

The three main coordination or Triple Helix is the relationship between the universities, industry and the government. In the early 1990s Etzkowitz (1993) and Etzkowitz and Leydesdorff (1995) compiled the research of Lowe, Sábato and Mackenzi who have studied the model previously in 1982. Their job was to explain about the relationship between the two sides of industry and the public sector in the industry. Following this, they applied the relationship from two sides to three sides with regard to the university, industry and social public sector (Stanford University, 2016).

ACDP Secretariat (2013) proposed the principle of “Triple Helix” in which the strategic approach was collaboration between universities, the industrial sector and the public sector to promote innovation and help the economy grow in the country. It was composed of three key elements as follows:

1. Knowledge-based society has the larger role of innovation compared with industry and government.
2. Regarding the movement of the relations of cooperation between the three institutions, the result of innovations will be increased with the interaction rather than being determined by the government.

3. Each institution carries out their role while at the same time that they have been implemented and given a new role.

For example, Indonesia has used of the partnership between the three groups, industry, university and the public sector in terms of economic development in the country. All of the three sectors were separated from each other but they have interacted in the field of development with a small amount of cooperation and knowledge. The basic problems were misunderstanding and lack of trust between each other. Whereas the university has developed its strategy, the stakeholders from industry are involved very little or none. The majority of scholars believe that the industry is still selfish and lacks a sense of responsibility for the society. On the other hand, the industrial sector's opinion was that the university and governments were working only on the campaigns to promote their ideas and mainly in order to reach the objectives they wanted to achieve. In addition, the university framework was not able to bring a partnership with the industry. The relation can be displayed as in seen the figure below:

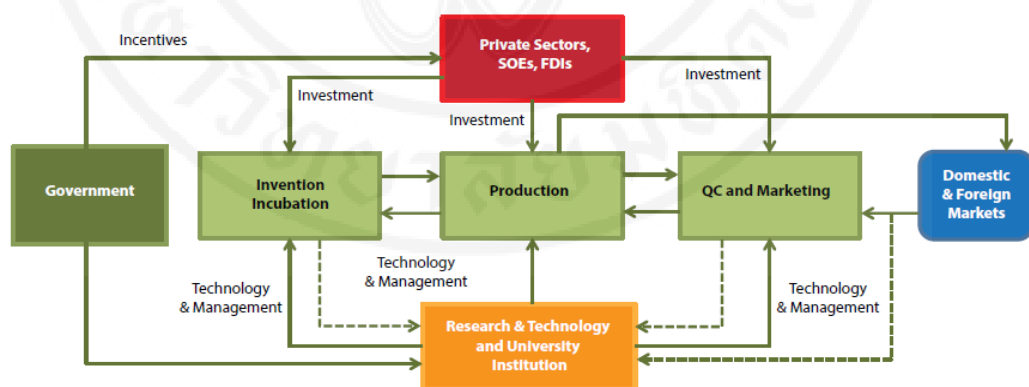


Figure 2.6 Relationships of the university, industry and government to develop innovation

The Triple Helix Model of a knowledge-based economy created by Etzkowitz and Leydesdorff in 1995 included the main institution and university, the industry sector and the public sector. However, the transfer of innovation in these institutions can be divided into two steps. First, there is a step of a network of institutional relationships, which were those institutions limited of

reciprocal behavior. In addition, the second step is the functional relationships, which were these institutions creating mutual expectations of each other (Leydesdorff, 2010). Furthermore, Leydesdorff created the Interaction of Triple Helix model interactions between the activities of the knowledge economy, which is shown in the Figure below:

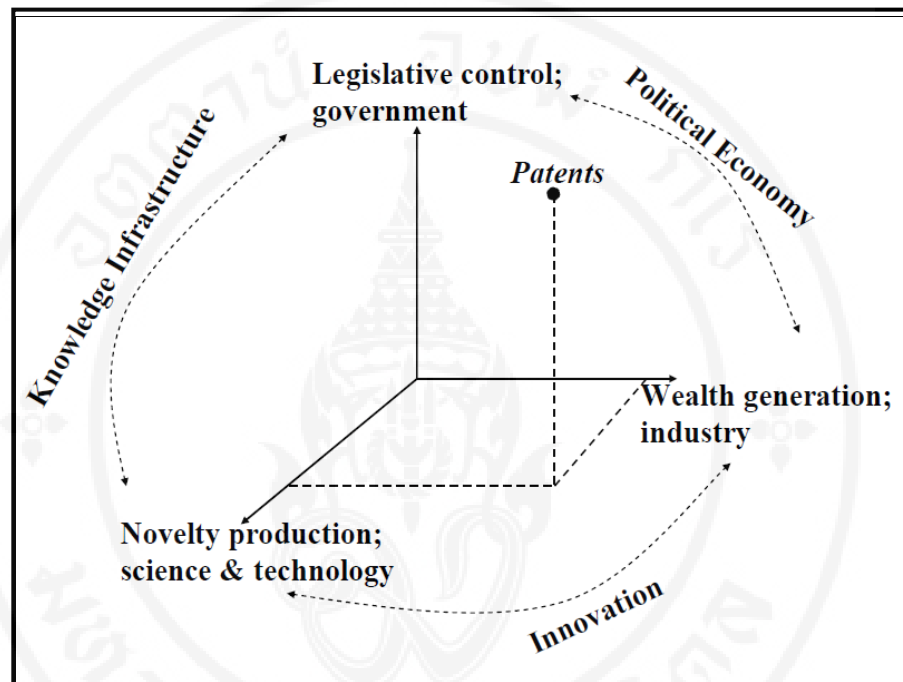


Figure 2.7 Relationship of the interaction between universities, industry and the public sector in the knowledge economy

In their study conducted in Thailand, Chaikul and Angasit (2011) investigated the development performance and ability of competitiveness in terms of part manufacturers and, equipment, fixtures and furnishings in the automotive industry. Moreover, they studied the relationship between education institutes and industry segments, including automotive parts suppliers and automotive manufacturers by using the three groups that belong to the principle of the Triple Helix model and the Knowledge-based Economy. This study focused on the talent availability of students from studying industrial design at the Academy before entering the workforce in the parts manufacturing industry. Moreover, the study of the talent availability found that the correlation between education institutes and industry has been an attempt to

transfer and exchange knowledge with each other. Due to automotive manufacturers still demanding and expecting students after graduation, they will have the ability to learn and train for new assignments from employers within 6 months or 1 year and continue further to be able to pursue a job in manufacturing. However, the manufacturers do not expect that all graduates will be able to perform the specific job immediately. In terms of industrial designers wanted to have the ability to design and creativity, but conform to the ability to produce profits (economics) and knowledge of the market. In terms of cooperation with the government and through the universities, the industry intended to cooperate in all aspects such as giving the internships, specific training, educational visit programs and sponsor courses for the education institutions. This meant that this model was a very significant point to the students to improve and develop their knowledge. According to Business Week, which ranked the top 60 design institutes of the world in 2009 and supported by the industry with Course sponsorship, called "Business partnership", the model has enhanced the knowledge and experience of students as automotive designers. The parts manufacturers were expected to graduate students that would have the ability to work immediately after graduation or within three months after training. Nevertheless, the manufacturers have chosen those who gained experience from previous jobs due to the competitiveness and high value of the market. Regarding the internal training for the new associates, all of the interviewers agreed that the practice training or on-the-job training was the most appropriate, especially with the transfer of the knowledge, skills and techniques from the supervisor or colleague to new associates. The educational institutes were under pressure from the families of students as well as the industry, with regard to the question of whether graduated students will have the ability to work as intended. It was not easy for the educational institutes to provide general education courses and also to train the other students in a limited time. The Industrial sector needed the graduated students, industrial designers, that must have knowledge more than capability in designing products including an understanding of the market fundamentals, economics, and process engineering required to design the products. Therefore, the ability can be applied with the new technology. However, if the model has created the representatives of those groups or the committee for clear cooperation in terms of support knowledge, the concrete targets of the objectives will be achieved.

The Office of the Education Council (2549) studied the manpower of the industry needed, including with 14 industry groups. The results of the research of the problems in this study found that the government should have a plan and develop manpower in the future to meet the needs of the industrial sectors and developing countries, both quantitative and qualitative. Additionally, a mechanism for cooperation in the production and development of manpower were related to the various parties that were involved in the establishment of a central organization or a national committee to provide values of learning, vocational training, or to work alongside measures to mobilize resources for manpower development in a systematic way. Furthermore, all of the parties have established a manpower database to exchange information and provide mutual benefits to both sides. The objective has given the direction to support the labor development skills with the necessary resources for the private sector and encourage investment of the private sector with the same multinational companies, etc. In terms of recommendations to the private sector to prepare for the educational projects, the parties can cooperate with the government and educational institutions in the training of students.

The review of concepts and theories on cooperation in the development of various skills, including knowledge transfer and innovation, found that Public-Private Partnerships (PPPs) and the Triple Helix Model are similar in the significant principles in cooperation. Nevertheless, the Triple Helix Model has separated universities and institutions to be the third party. Meanwhile, the universities and institutions are involved in the public sector in terms of PPPs. The main point was to develop education and training policies in this country. Although the universities would be able to determine the courses and programs based on the specialists, they are under the government monitoring and evaluation of programs. This means the government will acknowledge, manage and control all national courses. These are the different points of the concepts and theories if we apply and create the formation of policies and cooperation between the public and private sectors based on academic factors as well.

Table 2.3 Comparison of the Triple Helix Model (university-industry-government relationships) with Public Private Partnerships

Subject	Public-Private Partnerships	Triple Helix
Type of cooperation	Public and Private	Public, Private and University
Objective	• To develop the effectiveness of competition in the economy and society, including the problems in the management of the public sector, which are a lack of experience, technology, or new public administration.	• To develop effective competition in the economy and society, including the problems in the management in nation and international areas. • To strengthen innovation occurring from the three parties. The university is the leader in the development of innovation and is focused on development of labor skills.

2.3 Human Resource Development Theory

Umezumi and Sugiura (2010) noted that the definition of “labor” came from the Latin word “laborem”, which meant ‘pain and working hard’, but it did not mean the job requiring use of wisdom. However, according to the Labor Standards Law, it was this that made the labor force legitimate. In fact, the concept of fighting between “labor” and “capital” was the basis of different ideas in the past century. It divided the world into the Eastern group led by the former Soviet Union (USSR) and the other group of Western industrialized countries. Later on, the companies in America and Europe became developed and more specialized. The HR department became independent and began to show the functions of this department. However, those who work in the company have also been defined as workers or employees. The current situation has greatly changed, and now the workers or employees are called Human Resources or Talent. Furthermore, most of the Human Resources, who were working in organizations, were graduating rapidly after World War 2. This meant that the Human Resources conformed with the ‘Strategy’ at that time.

Human Resource Development, or HRD, covers many topics such as health services, nutrition, population control, education and training (de Silva, 1997) and employment policies that were linked to individual and business sectors, together with the right skills and capabilities in application modernization (OECD, 2006). This study discussed the specific workforce development, education and training due primarily industry and the direct economy (de Silva, 1997).

HRD is a process to enhance the knowledge, skills and abilities of people in society. In the context of economics, it can be used as an indication of the enhancement in human capital and a worthwhile investment in terms of economic development.

In terms of training and skills development, employers in many countries still have the attitude that workforce training is a responsibility and burden of the government. Training is conducted by the government and is supported by the private sector, especially large businesses in various industries. They are granted a responsibility to train employees for the benefit of employment. The expansion and development of general public educational services for the populace is focused on modernization and in response to various industries. However, most of the industry requirements, such as more quality, skills, professionalism, and technical and

interpersonal skills have normally belonged to the private sector that have begun playing a huge role in providing internal training (In-House Training). In addition, the implementation of joint investment in the development of human capital was increasingly implemented by many organizations, especially in the bilateral cooperation.

OECD (2006) observed that the HRD is first necessary in order to identify and seize the opportunities of investment. There are still many countries with the occurrences of market failure because of undeveloped labor skills. The policies of development and maintaining skilled labor, creating a good health program, and ensuring the quality of work life are an influence to encourage investment from the industry sector.

The problems of unskilled labor in Thailand can be provided a strategy with a comprehensive and consistent international policy, and can be linked with the implementation of it. The important points of preparing the policy framework are that it must be flexible and respond to the demand for new labor skills due to changes in technology and economic structure. This process of cooperation is utilized more closely among policy makers and key stakeholders. It is very necessary as HRD is a process to strengthen the knowledge, skills and abilities of people in society (Harbison & Myers, 1964; cited in OECD, 2015). HRD policies must take into account the quantity of the labor force and the rules that apply in the labor market. In addition, the government can directly develop human resources through educational policy and public health policy, yet it still can claim through policies to support enterprises to invest in human resources, for example, On-the-Job Training and employers taking part in the education system, etc. (OECD, 2015)

Gary Becker, who was a Nobel Prize winner in 1992, based on the research in Human Behavior, gave the new definition of 'human capital' in his textbook, named "Human Capital" in 1964. The theory of Human Capital is older than this textbook, but it was valuable and added to the Microeconomic theory. The framework of Becker was specific in the investment in Human Capital by investing in education and training programs. Becker's theory cannot be established in the analysis framework; however, it increased the compensation structure.

Therefore, the investment in Human Capital has intended that the human capital has the potential to learn the new technology. In Asia, the word 'human

capital' was rapidly transferred to "Human Resources". The secret importance of the philosophy in the word 'human capital' was an interest in human learning performance and the concept of respect for the individual. The meaning of investment in Human Capital was to increase the value of the organization by inputting more knowledge and technology to the Human Capital. However, the most significant advantage of this investment is employees who have gained the abilities, knowledge and skills.

The Human Capital management is one of the factors of investment in employees. The types of investment are the development and training programs with limited budget. Therefore, the proper interest in Human Capital investment is different in terms of the management level. Finally, the Human Capital management is the appropriate implementation for the employees by the top management to respond to the company's objective items:

1) Professional Development: Employees must develop the knowledge and professional skills in their career with support from the employers. If the majority of employees who worked in an organization have the interest in developing themselves, they will have the inspiration to accomplish the achievements. This means that they will create the innovations and new products for the company. All of the companies hold this basic fundamental belief.

2) Equitable and Fair Treatment: Employees must receive the equitable and fair treatment at the same level. This includes the permanent employees and temporary employees.

3) Stretch Goals and Empowerment: Expansion of the targets and empowerment must be a challenge given to the employees due to the need for increased efficiency. The coaching should be closely similar to training with smooth collaboration between management levels and employees.

4) Creativity: The respect of the individual, as well as the appreciation and understanding of new creativity, must be received from the employers and colleagues.

Hongladarom (2555) proposed the 8K's Theory: the basis of development of Human Capital Quality and also the 5K's theory: the Incrementalism of Human Capital Quality. Both of the theories are involved in creating the efficiency and competitiveness in ASEAN in the textbook of "8K's+5K's: The Human Capital of the Labor Force in Thailand supported in ASEAN" is as follows:

The definition of Development of Human Capital Quality is the concept of the 8K's Theory. Its basics consist of the following:

K1 Human Capital

K2 Intellectual Capital

K3 Ethical Capital

K4 Happiness Capital

K5 Social Capital

K6 Sustainable Capital

K7 Digital Capital

K8 Talented Capital

The above items are described in detail as follows:

K1 (Human Capital)

Human Capital is the significant basic concept from Becker. The humans started with an equal ability but how can society develop or invest in them for improvement of the skills from the others, and what should be done? The investment in terms of Human Capital is to preserve the current resources for the advantages in the future. The types of investment have the various directions, such as from youth to adult. Becker used economic theory to analyze the standards of the education system between one group who studied 16 years to earn more income than those who studied eight years in terms of the formal education system. The knowledge or training is first step of investment. (Hongladarom, 2555) The evaluation of regular semesters in the education system is still very important at this current time. However, in fact education in this situation was decreased because some students studied less than the others, but the quality of performance was better than the other. This was the background of the "Quality of Human Capital" or Competencies and Skills.

K2 Intellectual Capital

In addition to Becker's concept of human capital that quality is not measured only the education. The theory considers that humans have the ability to think, analyze and be able to solve problems. The methodology is the experience of working and creation of the strategy for the future itself.

K3 Ethical Capital

The quality of human capital is not only the knowledge, skills and understanding, but it is also a good way to create morals by following the teachings of the Buddha in terms of the first step. Then, the second step was followed Drucker, who explained about the importance of the qualifications with emphasis on three points, namely: 1) Integrity, 2) Imagination and 3) Innovation.

K4 Happiness Capital

Happiness Capital is the behavior that a person should have to make life valuable and consistent with their job.

K5 Social Capital

In addition to the creation of intellectual capital and happiness capital, it must be analyzed whether there is social capital and networks, or not. Therefore, it is to create value and efficiency for competitiveness by offering a model as follows:

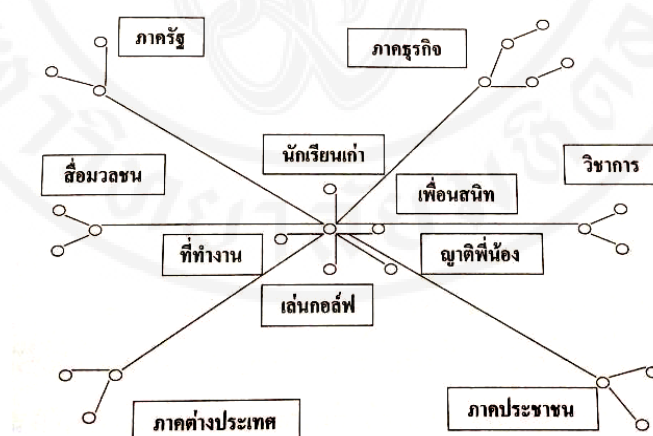


Figure 2.8 Model of creating a network from narrow to nationwide by Chira Hongladarom (Social Capital – Networking)

K6 Sustainable Capital

The Sustainable capital is a new concept and similar to the happiness capital. The theory considers that we have the potential for a future that will be survivable, or not. The sustainable capital is the investment and came from the principles of the philosophy of His Majesty King Bhumibol Adulyadej (Rama IX).

K7 Digital Capital

The quality of human capital must be able to bring information technology to the development of knowledge in any field, especially in investment of digital technology for conducting the research and development of the products, and modern communications to quickly learn more about customers' needs. Moreover, it involves the sharing of knowledge with society. Therefore, in the future Thailand must strive to learn and improve language skills in order to communicate effectively in the region. When the language skills and digital knowledge have been established, the communication will be easier and faster without the borders. Finally, the person who has the digital knowledge will be advantageous for industries to employ.

K8 Talented Capital

Intelligence Capital considers that the key success must require three simultaneous factors: skills, knowledge, and positive attitude. In terms of definition of the AEC (ASEAN Economic Community) era means that the person who has the best performance must have the inherent Intelligence. In addition, the person must develop ability, knowledge, skills, and a positive attitude and be proactive continuously. In particular, the positive attitude is very important. It is more difficult to change or improve skills or knowledge, especially in the era of the ASEAN free trade area. Therefore, Thailand must have positive attitudes, look forward to seeking opportunities and be ready to develop the people's intelligence. The development of Talent Capital requires effective leadership by using the "Theory of 5 E's". It is derived from the research of the Center for Creative Leadership as follows:

- (1) Example means Role Model
- (2) Experience means study from the persons who have the best experience
- (3) Education means study from the textbooks, training, conducting the research and development projects, etc.
- (4) Environment means the creation of a good workplace environment, which is open-minded in terms of the exchange of ideas.
- (5) Evaluation means following up with the evaluation of development skills.

In addition to the 8K's Theory, there are five important points, which allow the human capital to be of sufficient quality to survive and gain competitiveness in ASEAN society. It can be competition in a dignified and sustainable way, which is called the 5K Theory featuring the following: Creativity Capital, Knowledge Capital, Innovation Capital, Cultural Capital and Emotional Capital. It can be explained as follows:

5K's (1) Creativity Capital

Creativity Capital can be important to try to think outside of the box and practice to get the solutions to resolve the problems in various ways. This concept of creativity can be summarized as follows:

- (1) Practice how to learn new technology, including analysis of the problems and creating innovations of the products.
- (2) There must be time to think and concentrate.
- (3) Creative thinking is based on principles and facts.
- (4) Always want to do something new.

5K's (2) Knowledge Capital

Knowledge Capital is based on the principle of the Theory of 2R's. The first "R" (Reality) is defined as the knowledge of reality. Second, Relevance refers to the relevance of the clients' needs. The Knowledge Capital will lead to the Value Creation, Value Added and Value Diversity. It also called the "Wisdom".

5K's (3) Innovation Capital

Innovation Capital is the ability to do something new, and produce valuable innovations, which involve three elements:

- (1) Coming up with new ideas, creativity and combined knowledge.
- (2) Practice and implementation
- (3) Complete job performance

Creation or development of Innovation Capital consists of the 3 C's as follows:

- (1) Customers

(2) Change Management

(3) Command and Control Participation and Teamwork

5K's (4) Cultural Capital

Cultural Capital is to have knowledge and understanding of the importance of cultural awareness. There is the foundation of human life that consists of history, tradition, culture, religion, lifestyle, wisdom, practices and beliefs. It is the uniqueness of each country. All of these things are especially important in creating value in globalization. In addition, cultural capital also means knowledge, understanding of the culture of other countries, and the ability to manage cultural diversity as well.

5K's (5) Emotional Capital

Emotional Capital is known for regulating emotions and emotional management, including the role of leadership. The capital will reduce the emotional conflicts and contribute to peace and sustainable development.

For the studies on the development of human resources in organizations that are related and influential in labor skills in industries, Chaimongkol (2013) studied the development of skilled labor, which affects the productivity of workers in the automotive industry in Thailand. The evaluation of quality development policy is related to the productivity. The results of the study found that companies with employee training programs, government regulatory policy, and corporate training needed the satisfaction of their employees.

In addition, Phutrakhul (2014) studied the subject: "Human Resource Development Strategy in the Automotive Industry (Eco-Car) for the ASEAN Hub" in order to study the principles and strategies to develop labor skills in the automotive industry. The results of this study have found that the external factor, public policy, is related to the technology, labor market and labor development system in Thailand. Moreover, the internal factor, private policy, is related to the management, productivity management, company strategy, leadership, culture and philosophy in organizations as well. All of these factors have an effect on the development of labor skills in organizations and countries.

At present, Thailand's government is focused on the manufacturing and development of a skilled workforce to meet the professional needs of the industrial sector and to further develop the economic base of the country. The cooperative base includes the Ministry of Education, the Ministry of Labour, the Ministry of Industry and Industry members. The main strategic objectives are to urgently improve the curriculum of the Dual Vocational Education System, such as practical training in the workplace and encourage the foreign languages. The benefit is to develop the labor skills for the labor market, especially in the quality of competitiveness for the international markets. Furthermore, the government has the commitment in terms of the partnerships by signing MOUs with the private sector and the community to create the best image of the Vocational Education System in Thailand. And herewith, the government established the development of a workforce database to encourage the master plan of manpower within a period of six months (Thailand News Agency, 2559). This was a major development in Thailand that was driven by the government. However, it is noted that not only the public sector will be able to develop a skilled workforce to meet the needs of the industry but also the private sector are significantly driven to help with the development of all aspects in this country.

The results of the foreign studies by Baum and Szivas (2008) on the subject of "HRD in Tourism: A role for government?" found that it is important to emphasize the linkage between tourism development and the role-function changing of the government. In the context of developing countries, especially when the tourism sector is not growing and increasing the annual income in the country the primary role of government is to support and facilitate the development of human resources at the operating level by incorporating into the education system, training and other activities as well. As Baum and Szivas noted, the tourism sector has a close relationship with the labor market due to the need to create the best quality of environment and services in industry. However, it is generally understood that the government has an important role in helping the people to gain full employment from the enterprises in the country and making recommendations on the integration of human resource development in the tourism industry's national sector. This can be involved with three items. First, it must include the tourism sector and integrate the interests of all groups. Second, there must be close cooperation between the public

and private sectors. Third, the tourism policy of those parties must be concerned with the education system and training system together with development of labor skills in this industry. It means that the achievement is related to the motivation, development and retaining of the high quality of the Human Resources as well.

2.4 Concept and Efficiency Theory

Efficiency is related to the relationship between resource inputs such as various capital types, including labor costs, materials, equipment and energy with the intermediate outputs such as timing for producing the products and the output of the final outcomes. The concept of efficiency in terms of economics is to justify the output in case of a limitation of resources (Palmer and Torgerson, 1999).

Palmer and Torgerson (1999) have identified the principles of efficiency into three types.

1. Technical Efficiency is the relationship between resources (capital and labor) and output. The technical efficiency increases performance in outputs because the labor has good knowledge, skills and attitude. This means that limited materials can be used, but the high output can be obtained with the same production conditions.

2. Productive Efficiency means the less investment is used, but the high performance of output can be achieved.

3. Allocative Efficiency means performance is not only just the result of the highest profit output, but also the efficiency of the distribution of the output to the communities. This type of performance can attain the targets when resources are to be distributed to achieve maximum results in the community.

In conclusion, the Technical Efficiency is to use limited resources to get high outputs. Productive Efficiency is to use different resources combined together to create high amounts of products based on lower investment. Allocative Efficiency is to combine all available resources in order to spread them into the community to get the most output.

According to the OECD (2001), the definition of the word “efficiency” is a reflection of good practices in engineering (technical efficiency), or in terms of economics (allocative efficiency). The performance in terms of engineering would be

measured by the processes output of productivity within the limited resources compared with the older technology model. The economic performance is to classify the relationship between importing resources with the output base for the lowest investment.

In addition, the book, “The Twelve Principles of Efficiency” of Emerson (1924) explained the performance of 12 major ways:

1. Clearly defined ideals: means establish the clear and important objectives
2. Common sense: means basic thinking and decision making
3. Competent counsel
4. Discipline
5. The Fair deal
6. Reliable, immediate and adequate records
7. Dispatching
8. Standards and Schedules
9. Standardized conditions
10. Standardized operations
11. Written standards – Practice instructions
12. Efficiency rewards

Regarding the definition specifically on labor productivity, or the Labor Efficiency, Stuebs and Sun (2009) defined the concept of Labor Efficiency in their Research, “Business Reputation and Labor Efficiency, Productivity and Cost”, in which it was explained as a measure of labor productivity per unit of labor cost. It means that it is consistent with the concept of economic efficiency.

Additionally, SPRING Singapore (2011) proposed a model of performance measurement of labor by the following formula:

$$\text{PRODUCTIVITY} = \frac{\text{OUTPUT}}{\text{INPUT}}$$

This can be calculated by including three items:

1. Working hours
2. The number of laborers
3. Labor costs

However, the study of Holland, Liadze, Rienzo & Wilkinson (2013) studied the relationship between the result of the growth in the national economy with the education research on “The relationship between graduates and economic growth across countries”. It was found that in Britain, the USA and Finland in terms of the graduates from universities, they were a directly related impact on increases in labor productivity and economic growth. The National Research Council (2012) proposed how to conduct performance measurement of labor in “Improving Measurement of Productivity in Higher Education” by stating that the improvement and process of measurement of the productivity must begin by raising awareness of the role of a performance evaluation tool by including the items below:

1. Education is the key that has a directly impact on productivity.
2. Performance of labor is directly linked to the performance of the education system.
3. The quality of education is the key to productivity.
4. The difficulty of the production process cannot be claimed on the process of performance measurement.

In summary, it can be said that “Labor Efficiency” of the maximum output is derived from labor and directly related to investment, in particular, to economic growth as well.

2.5 Summary of Review of the Theories and Analysis

According to study of the theories, it can be concluded as follows:

Table 2.4 Summary Table of Review of the Theories and Analysis

Theory	Type/Level of Relationships	Summary of Theory
Intergovernmental Relations Theory (A.Wongpredee and T. Sudhipongpracha, 2013; Pittaya bowornwattana, 2002;	- Central Government with Local Government -Government agency with formal and informal Government Agency	- A theory that shows the relationship between the Central government with Local government or Government agency with

Table 2.4 Summary Table of Review of the Theories and Analysis (cont.)

Theory	Type/Level of Relationships	Summary of Theory
D. S. Wright, 2000; Koliba, 2012)		Governments agency by divided into 2 relationship types. 1) Formal 2) Informal The formal relationship would be defined by a specific law. The informal is followed the structure and responsibility of each agency. - The relationships between Government agency with Government agency based on the organization such as centralization or decentralization. - The relationship would cover aspects such as the coordination of overlapping authority, negotiation, the reciprocal exchange and cooperation or conflict - The type of IGR is similar the relationship with process of interaction between organizations or Inter-organizational Relations (IOR) (Zanko, 1995) 4 items, namely coordination, cooperation, collaboration and conflict. Meanwhile, the competition may not happen in the relationship between the internal Government agency (IGR) even the overlap or conflict of each other.

Table 2.4 Summary Table of Review of the Theories and Analysis (cont.)

Theory	Type/Level of Relationships	Summary of Theory
Inter-organizational Relations Theory (M. Zanko, 1995)	- The relationship between organizations with organizations. All of them were related to the government or private sector or none. It can be the cooperation and have the business of each other. - The relations will have four types: 1. Bilateral 2. Centralized 3. Specific and 4. Network	- A relationship can be classified into five categories: 1. Interaction processes of coordination, 2. Cooperation, 3. Collaboration, 4. Competition and 5. Conflict. - Interaction and 5 process of IOR. Type of coordination, cooperation, collaboration and conflict is similar to the relationship IGR on the issue of the two organizations or more. The rules of principle are established for using of each other. The rules of principle may be established by the Parties or organizations such as the government or agency. - The relationship in IOR looks forward to seeking the positive side. (Coordination, cooperation, collaboration) and negative (competition, conflict). However, it is different from the relationship of partnership. Because the partnerships were specific only a positive relationship despite negotiations or exchange.

Table 2.4 Summary Table of Review of the Theories and Analysis (cont.)

Theory	Type/Level of Relationships	Summary of Theory
Public Private Partnership Theory (World Economic Forum, 2014; P.V. Schaeffer and S. Loveridge, 2001; M. H. Tansen, 2012; S.H.)	- Government with company - Government with private sector - Top level of the government with private sector/industry sector - Second level of the government with organization in company - Second level of the government with some business group	- Type of the relationship is related to the partnerships. It means both were received the benefits from joining the investment. - The new paradigm of Public-Private Partnerships is occurred. The reason is to manage to resolve the problem of government bureaucratic.
Public Private Partnership Theory M. Dunbar, 2013; C. Greve and G. Hodge, 2011; Jumphol Nimpranit, 2548; C.E. Linblom, 1959; R. Osei-Kyei and A.P.C. Chan, 2015; F. Hartwich & et al., 2007; M.H. Tansen, 2012; A. Arellano & et al., 2008; J. Vertakova and V. Plotnikov, 2014; A. Medhekar, 2014)	- The social responsibility of the private sector or corporate governance and flexible. - The relationship is long-term rather than short term. - The level of national policy (Participating policies) or an operation.	- Previously, a higher risk of investment. After applied new relationships and cooperative, it is developing variety of management and project such as more research and development, agriculture, health, education and workforce development. - Type of contract is under the State law. - The relationship between the public and private partnership has many types such as the relation between follower and following or exchange between seller and the buyer.

Table 2.4 Summary Table of Review of the Theories and Analysis (cont.)

Theory	Type/Level of Relationships	Summary of Theory
		This is consistent with the pattern of McGuire's. It is related to the policy by sharing resources and cooperation on the basis of any projects. However, the characteristic of PPPs is to be multilateral with good governance and a network policy. - The transfer of authority from the government to the partnership and associate partnership with non-governmental. The reason is distribution of risk between the partners together. - The partnership sometime is not interesting to the private sector because the benefit was too long. - The relationship is mostly taking long term. The sustainable of relationships must important to verify of the achievement of the business. - Regarding the relationship in the long term, so the economic framework and the government's management of country is important and affected to the co-operation partners respectively.

Table 2.4 Summary Table of Review of the Theories and Analysis (cont.)

Theory	Type/Level of Relationships	Summary of Theory
		- Type of relationship between public and private (PPPs) is similar to the pattern of Triple Helix Model which is comprised of three pillars, namely universities, public and private organizations as possible. The cooperation of Triple Helix has described about how to transfer the innovation and know how between university and industrial by cooperation from the government. The reason is to specific support the technical knowledge. Meanwhile, the PPPs are pointed to the overview of cooperation of the Public and Private.
Triple Helix Model (Stanford University, 2016; ACDP Secretariat, 2013; Siriwat Chaikul and Worapot Ang-gasit, 2011; L. Leydesdorff, 2010)	University, Industry and Government	- The relation of cooperation with 3 categories or Triple Helix Model is a Business Partnerships. If we compare the PPPs with Triple Helix Model, it shown that Triple Helix Model is a partnering. It is an implementation level such as training program for labor force. Meanwhile, PPPs is created the policy and strategy in the country. - The cooperation of 3 parties was changed from the 2 parties by responding to industrial society to 3 parties and responded to the knowledge society.

Table 2.4 Summary Table of Review of the Theories and Analysis (cont.)

Theory	Type/Level of Relationships	Summary of Theory
Human Resource Development (HRD) Theory (H. Umezumi and M. Sugiura, 2010; OECD, 2006, 2015; S.d. Silva, 1997; Chira Hongladarom, 2555; N. Chaimongkol, 2013; T. Baum and E. Szivas, 2008; P. Phutrakul, 2014)	- Overall development Human Capital in the country - Development labor skill in Public and Private sector	- Labor in terms of the economic is the “Capital”. Later, it changed to the Human Resources and then development to the Human Capital - Human Resources Development is coverage many functions. In terms of government view, it provided the public services such as Health services, Nutritional, Population control, Education and training program. - Private sector views can be divided into 2 categories; HRD is responded by the government and HRD is responded by the private sector. The objective of both side are intended to development labor skill. Examples of cooperation were the Dual Vocational Education System, On-the-job training for the student and etc. In addition, the Human Capital does not come from the government only, but it needed support from the private as well.

Table 2.4 Summary Table of Review of the Theories and Analysis (cont.)

Theory	Type/Level of Relationships	Summary of Theory
Efficiency Theory S. Palmer and D.J. Torgerson, 1999; H. Emerson, 1924; M.T. Stuebs and L. Sun, 2009)	- Labor association Organization from the Public and Private sector - National Economic	- The theory: It means the highest output under good management, resource and timeless. - In terms of labor, measurement can be evaluated in economic part and human resources part. The correlation of efficiency of education is related and effected to the labor efficiency and moved forward to developing economic in the country.

The summaries of the theories involved in this study show that all of the theories are related, especially the partnership theory between the government and the private sector. However, the context of this study is focused on policies that are related to cooperation between the public and private sectors. Moreover, the development of skilled labor cannot be successful and meet the requirements of the industry sector. Therefore, the issues of cooperation between the public and private sectors must be the primary consideration together with policy development and implementation. A summary of the pros and cons of each theory is as follows:

1. Intergovernmental Relations Theory (IGR)

- This theory describes the relationship between the government and the government. It cannot be used to describe the relationship between government and non-government organizations. Therefore, it cannot explain the relation in the cooperation of the public and private sectors.

- However, the reason that this theory IGR is involved in this study is because it can explain the relation in the cooperation between the internal public organizations. They are involved in development of labor skills, which has three principle organizations. Most of the authorities are clearly responsible for

following the regulations and structures, but there is still a problem of the overlap of functions and organizations during the implementation process. There is the problem of wasting time, manpower and budget if the government decides to implement the old management style. Moreover, the government is the sector that is responsible to enforce the public policy, but the government often has changes in the leadership; therefore, it would be difficult to continue the policy as well.

2. Inter-organizational Relations Theory (IOR)

- The theory explains the relationships between an organization and another organization. It is not concerned about the public and the public, or the private and the private. Therefore, it can be used to explain the relationships in this study. However, the IOR Theory is intended to explain in terms of the different situation and also clearly explains about the positive and negative aspects of this situation, especially in competition and conflict, as well. In the context of this study, it is used to describe the cooperation between the public and private sectors to improve and develop the labor skills. Furthermore, this theory is used to explain about how to improve and develop the cooperation of creating the policies and the implementation to provide the best conditions nationwide.

- The theory specifically studied and explains the relationships involving cooperation between organizations and created the basis of motivation in the workplace. Moreover, this theory can be used for improving the process of relationships between the public and private sectors.

3. Public-Private Partnerships (PPP)

- Most of this theory is involved with cooperation in the investment and risk management of infrastructure or the major project of the country. The government is to provide the various contacts to the private sector, which distributes the risk to every contractor. The reason is to reduce the huge investment and able to contribute the budget to the development of other projects. However, the PPP is widespread in terms of the economics, but in fact, this type of cooperation is not effectively used yet with cooperation in the investment in development of education, labor, and health care.

- In addition to, PPP theory describing the benefits, risks, management, contracts or agreements, it also describes the transfer of power and

authority among government partners to the partnerships. The theory is very flexible and adjustable to provide the specific policies which can be implemented nationwide.

- PPP can be applied in this study of the development cooperation between the public and private sectors who wish to enhance their work in determining the course to improve their employees' knowledge and ability to meet the needs of the private sector, including improving the labor efficiency. The concept of this theory for improvement of the labor performance is based on the foundation of Human Resources development in this study. This will allow researcher to describe the relationships of cooperation in the development of effective labor as well. In addition, guidelines can be studied and developed for collaboration between the public and private in terms of the development of labor skills in the future.

4. The Triple Helix Model

- The Triple Helix Model is very similar to the PPP, but it only splits out the university into a third party. The study found that the transition in cooperation with two parties to cooperate with three parties is in response to the knowledge society in particular.

- The Triple Helix Model is used to describe the mechanism of innovation and knowledge transfer between universities, industry and the public sector. The research will be led by the Triple Helix Model to the type of partnership that is the model for the implementation in terms of the new projects. However, it cannot be used to describe the relationship for the development of joint labor between the government and the private sector to cover it in this current situation.

- The university is the one part of the Triple Helix Model, but it can be applied to use with the PPP as well. Therefore, this theory can be modified to be used with PPP theory and able to develop in terms of the improvement of the education system and labor skills in this research.

From the explanation above, this research study is focused on the concept of a partnership between the public and private sectors (PPP) in order to describe the relationship as a guide and learn how to develop labor together. Most of these theories are to create labor efficiency, which needs to be consistent and meet the requirements to enter the industry. Then, the process will drive the productivity to increase the economic growth in the country.

2.6 Summary of the Review Literature Table

Table 2.5 The summary of the review literature that is related to the cooperation between the public and private sectors

Researchers	Literature	Conclusion Issued
Schaeffer and Loveridge (2001)	TOWARDS AN UNDERSTANDING OF TYPES OF PUBLIC-PRIVATE COOPERATION	It can be divided cooperation into 4 types as follows; 1. Leader-Follower Relationships 2. Exchange Relationships (Seller-Buyer Relationships) 3. Joint Venture 4. Partnership
Nattapong Phuensaen (2553)	The study framework of the bilateral in cooperation between Public and Private sector in case “To produce the electrical by alternative energy”	Explained that the theory of bilateral in cooperation between Public and Private is different concept which is consisted the Neo-liberalism and Neo-conservatism. Therefore, the meaning of the different concept can be used in various ways in terms of the context of society and economic.
Chan and Müller (2012)	Explaining the geographic, thematic and organizational differentiation of partnerships for sustainable development. In Public- Private Partnerships for Sustainable Development Emergence, Influence and Legitimacy	Proposed the concept of emerging the partnerships theory into 3 theories as follows: 1. Functionalism partnerships 2. Policy Network Theory 3. Institutionalism.

Table 2.5 The summary of the review literature that is related to the cooperation between the public and private sectors (cont.)

Researchers	Literature	Conclusion Issued
Pattberg, Biermann, Chan and Mert (2012)	Introduction: partnerships for sustainable development	Proposed that PPPs is a tool to increase the efficiency up for the government which brought the New Public Management Model to implement in era 1980
Ahmed Shafiqul Huque and Charles Conteh (2014)	Introduction: Paradoxes of public management reforms in developing countries	Proposed the PPPs is a tool for the policy of bilateral which has code of conducted and admire by the law
Muriel Dunbar (2013)	Engaging the private sector in skills development .Oxford: Heart	Applied for explanation about the partnerships of industry and education sector.
Greve and Hodge (2011)	A Transformative Perspective on Public-Private Partnerships	Explained the PPPs is conducted the new public management (NPM) which is the countermeasure to resolve the problems of the overlap job function and delay the mission
Jumphol Nimpanit (2548)	The Principle and Concept of the New Public Administration and Example in Thailand	The results of the public administration revolution affected the government, which is specific to the necessary role and job function.

Table 2.5 The summary of the review literature that is related to the cooperation between the public and private sectors (cont.)

Researchers	Literature	Conclusion Issued
Robert Osei-Kyei and Albert P.C. Chan (2015)	Review of studies on the Critical Success Factors for Public–Private Partnership (PPP) projects from 1990 to 2013, Int. J. Proj. Manager	Explained that the expert of the management and skill of private sector is applied to hiring or made the partnerships with the government. The advantage is to cooperation with the big project such as the infrastructure in health service
Frank Hartwich and et al. (2007)	Building Public–Private Partnerships for Agricultural Innovation. In Food Security in Practice technical guide series	Latin-America applied the PPPs to implement the research and development in agriculture sector for reduce the production cost
Musharraf Hossain Tansen (2012)	Public Private Partnership (PPP) in the Technical Vocational Education and Training (TVET) Sector in Bangladesh: Challenges and Prospects	To suggest the strategy for strengthen to the partnerships between public and private sector in terms of the dual vocational education in Bangladesh
Arellano et al. (2008)	Public-Private Partnerships in Labor Markets	The cooperation between public and private is to achieved the target in terms of the context of the labor market
Julia Vertakova , Vladimir Plotnikov (2014)	Public-Private Partnerships and the Specifics of Their Implementation in Vocational Education	Explained that the overlap of the economic which is influenced by the financial crisis, it found that the cooperation would be improved the countermeasure to resolve the problem based on the direction and system as well

Table 2.5 The summary of the review literature that is related to the cooperation between the public and private sectors (cont.)

Researchers	Literature	Conclusion Issued
Medhekar (2014)	Partnerships for Inclusive Development: Role of Private Corporate Sector in Provision of Healthcare Services	Found that the good management of production cost should be had the innovation for resolve the tourism and health service problems
Chaimongkol (2013)	Development of Skilled labors that Affecting Firms Labor Productivity of Automotive Multinational Enterprises in Thailand	Found that most of the companies had the associate training programs by following the government law. Moreover, the companies' policy also had the training program to provide the motivation to the associate as well
Baum and Szivas (2008)	HRD in tourism: A role for government?	Found that the government role in developing country is encourage to develop labor skill in operation level by apply the cooperation to the education system, training program and activity
Phutrakhul (2014)	Human Resource Development Strategy in Automotive Industry (Eco-Car) for ASEAN Hub	Found that the factors, which is impacted to the labor development skill, were mostly related to the cooperation between the leader of public and private sector to drive and provide the associate to success in development skill

2.7 The Related Literature Review Analysis

Based on the review of the concepts, theories and related literature as per Table 2.3 and 2.4 it was found that the cooperation between the government and the private sector to create the efficiency and to best provide the public services had various models and that different ideas are able to be used to achieve the targets. However, the government might make use of the private sector management model to apply some areas as follows:

1. To focus on the accounting management and strengthen in terms of the profit and loss which affects the service recipients.
2. To build the capacity of personnel in an organization.
3. To reflect on the real needs for public services of the people.
4. To transfer advanced technology, knowledge and benefits to government officers.
5. To invest in the public facilities that provide services to the people, especially in cooperation between the public and private sectors.

An example of the two management principles used in the partnership may be divided as Leader-Follower Relationships. This model informs that the public or private sector can be leaders or followers. However, this model is based on the knowledge, performance and the experience of the both sides, which can provide the best services to the people. The other model is Exchange Relationships (Seller-Buyer Relationships), which is the relationship intended to describe the role of cooperation in terms of the exchange of technology and knowledge in internal organizations. For example, the private sector can intend to supply the new model equipment and technology to the government in terms of the “joint venture” type for the development project, which will enhance the benefits of both parties as well. Furthermore, the partnerships of both parties will have the potential to easily create the independent organization to manage and possibly to clearly make the decision, especially with decreasing the risk of investment. Therefore, this cooperation of partnership will have the specific role to provide the public services policy to the people. The other type is called the “partnerships”, which have cooperative objectives for both of the parties to propose various suitable projects to provide the best services and resolve the problems for the people in the country. However, this “partnerships” type can further be divided

into two types. First, it is the limited responsibilities of stakeholders and second, is the unlimited responsibilities of the stakeholders. Both types are similar to the company that creates the best efficiency to operate the best organization, such as the public services policy to provide the best direct response to the people in the country. Moreover, the cooperation between both parties have shown that the government, who is unskilled or lacking expertise in terms of the public management, will be assisted by the private sector to reduce the delay of projects and increase the efficiency to resolve the economic problems, particularly within the corruption area. The principles of this partnership type are related to the “Policy Network Theory” as well.

Public-Private Partnerships (PPP) are the cooperation between the public and private sectors to improve the management system in terms of using the New Public Management (NPM), which was established in 1980 (Pattberg, Biermann, Chan and Mert, 2012). The cooperation of this model is used to urge the governments to be aware of their responsibility for delayed processes and any inability to provide effective public services to satisfy the expectations of the people. At first, this model was used for the major government projects or the basic infrastructure in the country, which needs more investment budget. After this model contributed to cooperation for both parties, it was applied to the public services such as health care, education, development of labor skills, etc.

Another important aspect of public-private partnerships is the emergence of innovative phenomena, such as products, collaborative management methods, and the decrease of the government investment costs and the linking of it to the creation of the knowledge for government officials. This can create the direction of public policy initiatives for the people, and enrich the stable economy and sustainable and competitive civilization.

The achievement of the goals and success of developing collaborative policymaking has several important components. In this study, the researcher explained the actors and the relationships of partnerships. These were divided into several categories, such as the type of permanent or temporary government committee, an authority that serves to analyze the plan, and policy makers and stakeholders in the public and private sectors, to drive or manage the mechanism to maximize the benefits of the policy and transfer it to the relevant actors. The

government or private sector must be aware of the collaboration of each other. Otherwise, the implementation of the project to achieve the intended purpose will be difficult. The researcher has commented on the results of many research studies that have been cited in the preliminary research.

The situation of the Public-Private Partnerships in Thailand from the past to recent years, started with the period when General Prem Tinsulanonda was the Prime Minister who formed the Joint Commission for the Public and Private Sectors to promote the trade and investment of the private sector in the country (Government House, 2015) until the current government of General Prayut Chan-o-cha. The current administration has approached the concept to meet the problem-solving goals in line with the rapid economic development of the country, especially the project to develop skills and knowledge skills, and to improve the labor skills. Most of the governments believed that the one of the most important resources is the Human Resources. Therefore, the development factors of the country related to economics and politics must begin with the creation of knowledge for the people. It is an important part of the national economic and social development.

In addition, during the government of Gen. Chadchai Chunhawan, the Prime Minister's economic policy in the region addressed the political instability of neighboring countries in the region, such as political problems in Cambodia as well as other countries in Indochina. All of these countries had been affected by the ongoing cold war. This made the economic situation in this region not conducive to the investment and strengthening of the industry by the foreign investors. These factors had an important effect on our country, which still remains in this region. However, General Gen. Chadchai Chunhawan as Prime Minister found a compromise solution based on the model of diplomacy, called "Changing the battlefield to a trading field" by sending diplomatic signals to neighboring countries for the benefit of the region (Asian Focus, 2015). In addition, it brought the country into improved economic competition, industry, agriculture, commerce and so on. Therefore, human resources have been a major challenge for all governments to accelerate the development of skills, knowledge, and capacity to work effectively. Furthermore, Thailand needed to find the right ways to convince both local and foreign investors to believe that Thai workers have the expertise and skills to learn from entrepreneurs quickly and without the labor shortage if the industry continuously grows.

All these factors mentioned above are the policy making that the government needs to process in terms of the education and continuous development of the labor skills in order to provide the skilled labor force to the industry sector.

The past several years of the development of educational policies have seen the set up of various committees to study and develop curricula, starting with the curriculum management of the education system, including the Office of Basic Education, Vocational Education, Higher Education, and Non-Formal Education that must conform to the industrial sector, especially in the automotive sector which provides a high volume of the GDP ratio in the country. Moreover, the projects were pushed forward for the regional economic competitiveness, or “Detroit of Asia”, during the government of Prime Minister Thaksin Shinawatra. It was a driving force for fast-moving countries coupled with the economic growth of the country at that time, and also to show entrepreneurs and investors the ability and readiness of the country in terms of the human resources. Therefore, the government agencies have been making every effort to cooperate with the private sector.

However, the achievement of the collaborative development of labor skills, knowledge skills and labor performance has not occurred based on the government or the private sector from each side. Nevertheless, they need to have the best cooperation of each other. On the other hand, the results show that the collaboration has not been successful between the two sides such as the graduated students cannot immediately start working in industry but need to have the training for a short period. In addition, in the automotive sector more time is needed to complete the training before working in the production area. This means that the manufacturer need to pay more costs after hiring the newcomers.

Another issue of cooperation between the public and private sectors is the lack of continuity. Even if they have formed or adjusted the committees by the government era or modified the policies when the government changes, the impact of this issue is the uncertainties that cannot be met by entrepreneurs or investors. Although Thailand will still be the number one automobile manufacturer in ASEAN for many years, if the direction of the policy is uncertain, it will be difficult to maintain the level of competitiveness in the long term compared to neighboring countries such as Indonesia or Vietnam with the continuous growth of these countries.

Therefore, this research is aimed to study the cooperation between the public and private sectors in managing various aspects, both domestically and internationally. Under the guiding principles of the interpersonal relations theory, the relationship is described and classified as a relationship, and the situation and the problems analyzed as well as the pros and cons. According to the type of cooperation in the case of the public-private partnerships, the research focused on how to develop the labor skills, which are known as the human capital. This can be the most important factor that should be the top driving force to develop the country. However, the fact is that this situation in Thailand has shown that the unemployment rate is still a problem. On the other hand, the industry side still has the need for a huge number of laborers to enter the manufacturing, but they cannot be hired. This situation has shown that the supply of labor needed and labor skills have not matched the demands of industries. Therefore, to provide for the needs of the industrial and labor sectors concerned requires the creation of an education and training system. All of the processes are necessary for the cooperation between the government and industry to create the countermeasures to solve and develop the labor skills in Thailand. Therefore, the researcher has brought together the concepts and theories of public policy development, such as policy processes, incrementalism, the Intergovernmental Relations Theory, the Inter-organizational Relations Theory, the Public Private Partnership Theory, the Triple Helix Model, the Human Resource Development Theory, and the Efficiency Theory. In addition, this research is related to cooperation between the public and private sectors to study and develop the knowledge to provide a model of management, which can be applied in the future.

2.8 Research Framework

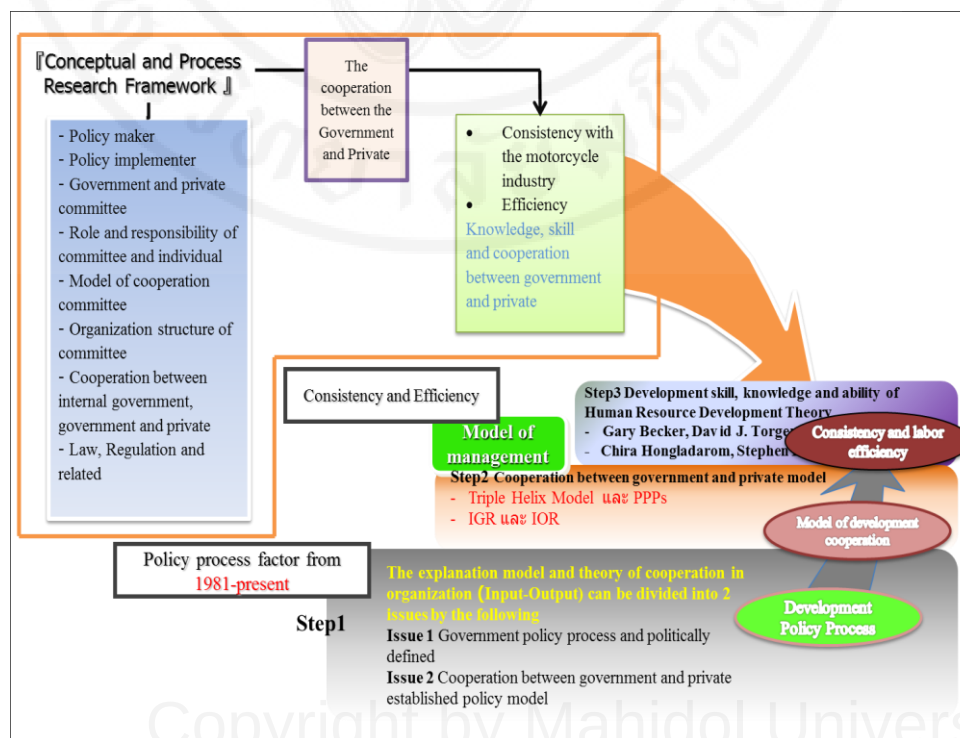
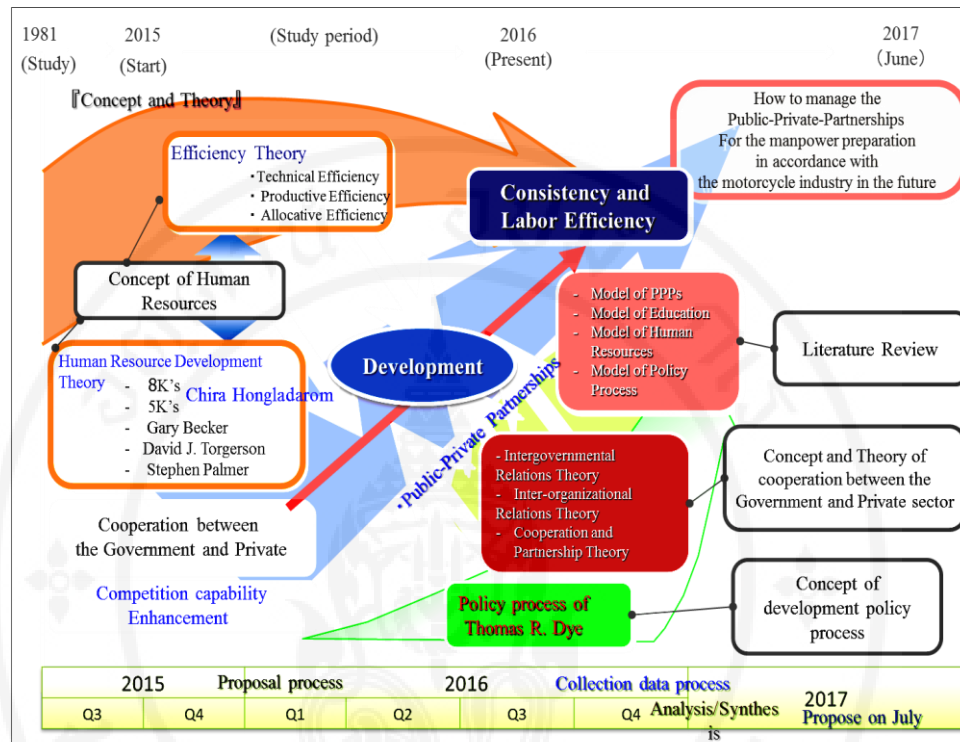


Figure 2.9 Research Framework

From the conceptual framework, the quantitative and qualitative research into the needs of the industry can be applied to the following concepts and theories:

Good government management is a consequence of well-developed and carefully planned policies, and covers relevant details that will lead to effective outcomes. Researchers prioritize the actors and factors related to the policy processes (See page 13 for details).

Each of the policy development processes has a relational representation in a various models that is explained by the Intergovernmental Relations Theory. The developed policies are then directed to the process of transmitting to analyze and synthesize into the action plan and management process as well as lead to results (Output), which can be described theoretically as follows:

1. Public and private co-operation can be classified into two issues.

The first issue is a policy of the state that has undergone a policy-making process and has been formally adopted.

The second issue is a government management model that is a collaboration between the government and the private sector based on the policies.

In developing a cohesive policy for improving labor productivity by Dye (2013) in terms of the Policy Process (See page 13 for details), at each stage there will appear relevant actors and those actors are structurally related (agencies/organizations) as well. The theory that is related to this development policy is the Intergovernmental Relations Theory (IGR) (See page 27 for details), which is used to explain the collaboration in deep detail between government and private organizations and also private and private organizations. Moreover, the Inter-organizational Relations Theory (IOR) (See page 28 for details) can explain the relation between both sides as well.

When a policy and the relationship of the relevant actors occurred, the researcher has adopted the principles of the policy extension theory of Incrementalism by Linblom (See page 40), which discussed the lack of continuity in policy processes that can be reviewed. Furthermore, in this theory it is explained that if this theory is continually used in case of continuing the policy, it will provide the benefits to all concerned parties.

2. With regard to the process of management in cooperation between the government and industry sides, this study has introduced the Public-Private

Partnership (PPP) theory (See page 30) as a basis for studying the relationships and formulation that will be utilized. In addition, the cooperation is considered in conjunction with the Triple Helix Model (see page 47), which is most similar to the PPP principles. However, the process of management in cooperation is needed for the inter-organizational relations and Intergovernmental Relations concept to be explained. The reason is to eliminate the problem of overlap or other obstacles that prevent policy implementation.

3. To present the development of labor skills and knowledge and implement it by using the concepts and theories of the human resource development theories (See page 51) of Becker, Hongladarom, and Palmer and Torgerson respectively. By using the Efficiency Theory (See page 60), the principles are used to find the results of the cooperation between government and industry. This efficiency is in addition to the efficiency of labor and can be also described as the effectiveness of public-private partnerships.

In addition, when labor productivity is improved, it is consistent with the labor demands of the private sector, which are reflected in the relationship between the government and the industry sectors as well.

CHAPTER III

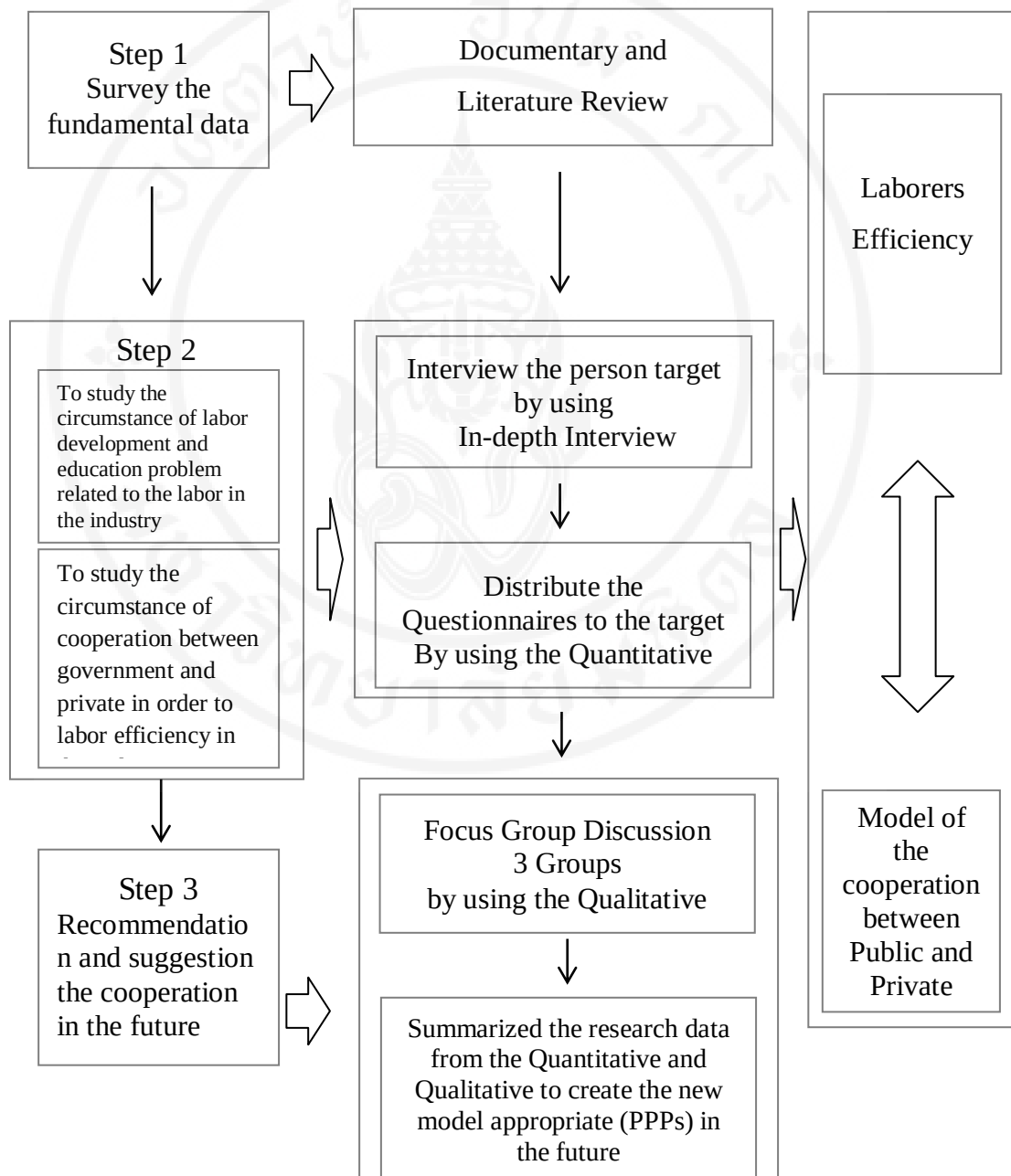
METHODOLOGY

To achieve the objectives of this dissertation, the research is a combination of methodologies, including both Qualitative and Quantitative Research Methods in order to collect both statistical and in-depth data as well as data from other sources (Creswell, 2003). The qualitative research is conducted in parallel with quantitative research (Concurrent Transformative Strategy) (Terrell, 2012) in the first step. Following this, the results of the quantitative research, such as statistical analysis, should be collected for the information to support this dissertation. Then, the qualitative research is further conducted by using the Focus Group Discussion to enhance the clarification of the study. The results of this methodology will be the conclusion on the public-private partnerships in manpower preparation and the development of labor efficiency in the motorcycle industry in Thailand. The research of this study was conducted with the following steps:

- 3.1 Research Design
- 3.2 Research Methodology
- 3.3 Population and Sampling
- 3.4 Research Instruments
- 3.5 Creation and Quality Inspection of Research Instruments
- 3.6 Data Collection
- 3.7 Data Analysis and Statistics
- 3.8 Interpretation of Data Analysis Results

3.1 Research Design

The steps of conducting the research to study the public-private partnerships in labor force preparation and labor productivity development in the motorcycle industry in Thailand are as follows:



3.2 Research Methodology

3.2.1 Qualitative Research

The qualitative research consisted of:

1. In-depth Interviews: Interviews of the people who are involved with the making of development policy and public administration, in relation to the cooperation between the government and the private sector in order to develop the labor efficiency in the motorcycle industry. These consisted of the following:

1) The Ministry of Education, Ministry of Labour, and Ministry of Industry, whereas the private sector consisted of eight companies that produce motorcycles which operate in Thailand, the Federation of Thai Industries, and the Motorcycle Industry Association of Thailand.

2) Extension of the policy of development labor skills is conducted starting from the preparation of the educational curriculum for the development of knowledge. The ability of the personnel to prepare before entering the motorcycle industry is in continuity with the development of labor skills while working in the industry.

3) The government and private administration.

4) The collaboration of both sectors is related to the strengthening of labor skills.

5) Putting the policy into practice.

6) Labor organizations such as the Federation of Employee Organizations, the Confederation of Labor Manufacturers of Motorcycle Parts, and the Associated Workers Union.

7) Federation of Thai Employers' Organizations

8) The recommendations on a new model to improve the efficiency of the cooperation between the government and the private sector in order to create the practical benefits in the future.

2. Focus Group Discussion: This tool is used as a guideline for specific interviews and provided a guideline for the development of government policy and collaboration between the government and the private sector in order to develop labor skills by engaging the human resources professionals of the private sector who are operating in similar types of businesses, government officials who are involved, and the associated union committee members. The questions are divided into 6 sections:

1) Are the laborers who have entered the motorcycle industry knowledgeable and skilled, and do they have a positive attitude in accordance with the industry?

2) What kind of development of labor productivity is focused on in the motorcycle manufacturing industry in Thailand? Also, what are the major problems?

3) How do government agencies and government organizations in Thailand develop curricula for education and labor development?

4) How does the private sector in Thailand develop labor development policies?

5) Do Government agencies in Thailand have a policy of labor development in collaboration with the private sector, or not? If so, what is the performance? Also, how will they collaborate on future work to improve the skills of the workforce?

6) Suggestions and Recommendations

3. Non-Participatory Discussion

4. How the Research was conducted

1) Equipment was used to record information during the interviews.

2) The recorder was used to obtain the full interview information.

3) Notes during and after the interview were taken by the researcher, who took note of important details while observing facial expressions, and then recorded them at the end of the interview.

4) The conclusion of the interviews was reached by each individual, and then the analysis of the data was conducted.

5. To study the development of the cooperation between the government and the private sector in the past (1981 to present) from the Document Review by classifying documents as primary and secondary documents, and to study and discuss the results of the in-depth interviews and focus group discussions. In addition, there is also the conducting of relevant studies, including the National Economic and Social Development Plan, the strategic planning of the Ministry of Education, the Ministry

of Labour, especially the Skill Development Department, the Thai Automotive Institute under the Ministry of Industry, and other related organizations

6. Qualitative Research

1) This study was conducted with Key Informants. The researcher selected the Purposive Sampling. The In-depth Interviews were conducted with a group of policy makers in the Ministry of Education, consisting of the Secretary of Education or a delegate, top executives or delegates of the Office of the Private Education Commission, Executives or delegates of the Office of the Vocational Education Commission, and top executives or delegates of the Office of the Higher Education Commission. The Ministry of Labour included the Permanent Secretary of Labor or delegates and the Director-General or the Chief Executive of the Department of Skill Development. The Ministry of Industry included the Permanent Secretary of Industry or delegates and the Executive of the Thai Automotive Institute. In addition, the private sector consisted of the Top Executives from the eight motorcycle companies, the Federation of Thai Industries, the Federation of the Thai Automotive Labor Union, and the Employers' Confederation of Thailand Council.

2) Focus Group Discussion: The participants were 12 Human Resource Executive Managers from the motorcycle companies and the Federation of Thai Industries, 12 related government officials and representatives of 12 union-related organizations. The researcher selected sets of 8, 8 and 8 respondents, and then divided them into 3 groups. The first group of representatives was the Federation of Thai Industries and the representatives of the public sector, the second group was the union committee, and the third group was the human resources representatives, representatives of the Federation of Thai Industries, Government agents and the labor union representatives. The discussion was divided into three sections in order to find the best conclusions. The third group discussion was held to consider and comment on the future development of public-private partnerships.

The total number of Key Informant and Focus Group Discussion participants included 50 persons.

3.2.2 Quantitative Research

The purpose of this study is to investigate the relationships between cooperation of the government and private sector of manpower preparation and labor

development skill to confirm the hypothesis of research item 2. This study covered the significant questions as follows:

- 1) Can Government policy and administration in providing pre-employment education courses produce skilled workers to meet the needs of the motorcycle manufacturing industry? (questionnaire for human resources staff)
- 2) When the laborers are entering to the motorcycle industry, do they have the skills and knowledge relevant to the needs of the industry? (questionnaire for human resources staff, and chiefs of production and quality)
- 3) Does the training from the government sector prior to working in the motorcycle industry increase labor skills? (questionnaire for human resources staff)

3.3 Population and sample for quantitative research

3.3.1 Population used in this study included:

- 1) Human Resources Officers: Distribute to all actual population
- 2) Production and Quality Chief Position Level or Higher: Distribute to all actual population

3.3.2 Sample Group of this study includes Human Resource Officers and Production and Quality Chief Position Level or Higher of eight motorcycle manufacturers in Thailand.

- 1) Sample size: The researcher used the method of Tarot Yamane (1967) to determine the confidence level at 95% or to set the error tolerance at 0.05.

The formula for calculating the sample:

$$n = \frac{N}{1 + Ne^2}$$

n = Total Sample size

N = Total Population

e = Maximum permissible tolerances

$$n = \frac{781}{1+781(0.05)}$$

$$n = 399.48$$

The researcher adjusted this to 400 persons.

Stratified sampling

1) The sample size from the sample group of the population from the Chief Position Level or Higher of PROD-QC and the Human Resources Officers from eight motorcycle manufacturers in Thailand was 400 persons.

2) Classify the population into groups, which can be divided into 8 companies as shown in Table 3.1.

3) The sample size distribution of the 400 samples of the eight companies can be categorized according to the proportion of the population by using a stratified sampling method to obtain the sample size of each group of companies. The proportional sampling uses the following formula:

$$n_i = \frac{N_i}{N} \times n$$

n_i = Sample number

N_i = Population number of each company

N = Total population

n = Total sample number

Table 3.1 Number of sample group participants from each company

No.	Company	Population Number			
		N_i	n_i		
			Total	HR	PROD-QC
1	Thai Honda Manufacturing Co., Ltd.	276	141	20	121
2	Thai Yamaha Motor Co., Ltd.	130	67	20	47
3	Kawasaki Motor Enterprise Thailand Co., Ltd.	130	67	20	47
4	Thai Suzuki Motor Co., Ltd.	80	41	10	31

Table 3.1 Number of sample group participants from each company (cont.)

No.	Company	Population Number			
		<i>N_i</i>	<i>n₁</i>		
			Total	HR	PROD-QC
5	BMW (Thailand) Co., Ltd.	30	15	5	10
6	Ducati Motor (Thailand) Co., Ltd.	40	20	5	15
7	Triumph Motorcycles (Thailand) Co., Ltd.	50	26	10	16
8	ATV Panther Co., Ltd.	45	23	5	18
	Total (N)	781	400	95	305

Source: Human Resources department of each company

When dividing the sample from the table above, the researcher used the purposive sampling for the human resources department of each company.

3.4 Research Tools

3.4.1 The data collection tool used in this study was the questionnaires, which were divided into two sets. The first set was used to collect data from the human resource officers and the second set was used to collect data from the chief position level or higher from Production and Quality. In addition, this collection of information was conducted in order to investigate whether laborers have the ability to be able to work in accordance with the industry requirements immediately. All results will be analyzed and combined with the qualitative research data in the next step. The questionnaires were as follows:

Questionnaire set 1 was divided into 4 parts as follows:

Part 1: Respondent's personal questionnaire. The questionnaire was a checklist consisting of questions about sex, age, education level and years of employment.

Part 2: The government's curriculum, education and training programs in the following areas:

- 1) Does curriculum management affect the creation of knowledge in the workplace of the motorcycle manufacturing industry?
- 2) Does curriculum management affect the ability of laborers in accordance with the private sector requirements?
- 3) After laborers have participated in or received government training services, are their skills improved?

Part 3: A questionnaire related to the activities of cooperation between the government and the private sector. The results of these activities can improve skills or provide benefits to laborers such as training activities, and the improvement of labor skills. Do these activities provide the benefits to the labor force?

Part 4: The Suggestions and Recommendations

Questionnaire set 2 was divided into 3 parts as follows:

Part 1: Respondent's personal information. The questionnaire was a checklist consisting of questions about sex, age, education level and years of employment.

Part 2: A questionnaire was used to measure labor competency resulting from government curriculum management.

Part 3: The Suggestions and recommendations

Parts 2 and 3 of questionnaire set 1 and part 2 of questionnaire set 2 used a rating scale. The weight of assessment is five levels as seen in the following table:

Table 3.2 Variable weight configuration

Selected answer	Point of answer
Excellent	5
High	4
Moderate	3
Low	2
Least	1

3.5 Creation and Quality Inspection of Research Instruments

3.5.1 Study of the principles, concepts, theories, and research findings related to public policy development and administration in cooperation between the government and the private sector in the development of labor skills in the motorcycle industry in Thailand was conducted.

3.5.2 Defining of the operational definition of all research tools is based on the theoretical and relevant theoretical bases from the procedure in Section 3.2.

3.5.3 The research tools were created by constructing the questionnaires. The researcher considered the creation of the questionnaire according to the correct academic principles.

3.5.4 The tool's quality was checked by the following steps:

1) The interview form was brought to three specific experts by using the Purposive Sampling, namely, the experts on the development of the relationship model of public-private partnerships and experts in curriculum development and skill development in order to consider the overall questions to cover the full contents in accordance with the purpose of the study as well as whether the language used is appropriate for the contributors. The interview form may be checked by an expert, and interviews with the sample were conducted to determine the appropriateness of the language. In terms of confidence, it was tested by repeated interviews as well as repeated questionnaires, or perhaps the reliability of the answers obtained from interviews were verified by using multiple interviewers to interview single contributors. Then, it was for the consistency of the answers with other interviewers.

2) The questionnaire was used to examine the quality of the content validity of the questionnaire by selecting three specialists (purposive sampling) who are experts on the relationships between public and private partnerships, the experts on labor skills development and the development of a study curriculum by allowing the experts to determine the validity of the questions. In this item, the consistency index between the questions and the operational definitions (Item-Objective Congruence: IOC) was found. The IOC of the questionnaire used in this research was between 0.78 – 1.00, with an IOC value greater than .50 for every question. Therefore, the questions are consistent or appropriate. The questions were announced by experts, and the questionnaire was completed.

3) The Verification of Confidence (Reliability) by using a questionnaire was created to evaluate a non-target or non-sample of 30 employees, and then data was collected to analyze the reliability of each variable by using the methodology from Cronbach's method (Cronbach, 1951). The optimum was between 0.60 – 1.00 and from the 30 evaluators, the result was 0.9.

3.6 Data Collection

The study was conducted by self-collected data. The steps were as follows:

3.6.1 The researcher requested a letter from the Executive Director of the graduate program of Mahidol University. Then, the researcher submitted the letter to public and private organizations and asked for cooperation in the interviews, questionnaire and data collection.

3.6.2 The researcher coordinated with the public and private organizations and explained in order to create an understanding of objectives of this research and the process of interviews and answers.

3.6.3 The researcher conducted the collection of the questionnaires, the interviews and the data collection as well as the focus group discussions.

3.6.4 Data from the related research Guessing.

3.7 Data Analysis and Statistics

3.7.1 Data analysis

Qualitative research: The researcher used in-depth interviews and focus group discussions on tape transcription and tape-to-tape validation and observation data, including analyzing data by using Content Analysis, where the researcher uses sub-topics to collect them into the same subject or group, called the theme summaries. The continuity and harmony of in-depth interviews and focus group discussions were summarized in this research paper describing and explaining the data obtained and the conclusions of the quantitative research in accordance with the objectives.

Quantitative research: The researcher analyzed the data using computer programs to find the statistics.

3.7.2 Quantitative statistics used to supplement the qualitative data analysis

The researcher selected statistical analysis to be consistent with the type of the data as follows:

1) General information of the respondents is gender, age, education level and years of employment. All data were analyzed by frequency distribution and percentage.

2) The Central Tendency is displayed by Mean.

3.7.3 Data analysis was done by using the triangular data analysis (Triangulation) (Denzin, 1989), especially considering the interaction between the documentary data, the interviews and group discussions and the questionnaire results.

3.8 Data Interpretation

In this research, an average translation criteria is defined by the following:

$$\begin{aligned} \text{Class Interval} &= \frac{\text{Maximum point} - \text{Minimum point}}{\text{Number of class}} \\ &= \frac{5 - 1}{5} \\ &= 0.8 \end{aligned}$$

Thus, there are five levels of public and private policy development and administration that affect skill labor development as follows.

Point 4.21 – 5.00 means level of development Excellent

Point 3.41 – 4.20 means level of development High

Point 2.61 – 3.40 means level of development Moderate

Point 1.81 – 2.60 means level of development Low

Point 1.00 – 1.80 means level of development Least

The level of employees' job performance with a mean score range between 2.61 – 3.40 is set to be a standard score to compare the level of performance in the manufacturers that will demonstrate the labor efficiency.



CHAPTER IV

RESULTS

4.1 The development of education policies and educational curricula for knowledge and skills building of workforce for industry

4.1.1 The development of education policies and educational curricula

The education policies have been developed as follows (Amornvit Nakorntup et al, 2014);

1) Adjustment to education for career

The development of education management has been concrete and extensively expanded since the reign of King Rama V to the reign of King Rama VI (1919-1925). The education was operated in the context of changes including improvement of education administration systems and division of relevant ministries upon the responsibilities, schools classification, enact the Education Act and issue various regulations, changed from education for a bureaucratic support to focus on the profession in various areas such as handicraft, business and agriculture. In addition, more vocational schools have been established and some school has been promoted to university in higher education level which became to Thailand's first institution of higher education "Chulalongkorn University"

2) Education management after the revolution in 1932

After the revolution in 1932, the education management has created more educational opportunities and equality. Especially, both general and extracurricular were arranged focusing on profession in many fields. The National Education Plan was announced in 1951 which was as a foundation for vocational education system, special education and adult education. Furthermore, The Act to reform the ministerial administration was legislated and lead to the Ministry of Education establishment.

3) The economic development plan formation

After World War II, Thailand changed its administration and ruled the country under global economic change and capitalism. The economy has entered an extremely recession. The government at that time announced a policy of capitalist economic development and has accepted financial aid from the United State and led to the first economic development plan (1961–1966). In the field of education, although the development of the plan is focused on the economy, industry and transport, it mentions education and public health in the first phase (1961–1963) by set the objectives to extend the education development along with the economic development especially the promotion of vocational training to train the people to work more professionally. In the Second Phase (1964–1966), it was determined that the country would have to produce sufficient levels of human capital to be supported in each sectoral economic development plan, namely the human resource needs that would be developed to support the country's economic development within 15 years (1966–1981). Especially, the vocational levels are necessary to improve both the quality and quantity and for higher education are focused on the expanding higher education to the Region including the emphasis on numerous production of students in the field of engineering, science and professional in the various branches. The universities accepted the policies by conducting the new disciplines in management, economics and technology. In addition, the government by the National Education Board adopted the National Education Plan in 1960, which emphasized the organization of the education system in line with the economic and social development plan.

The National Education Development Plan was subsequently enacted and announced under the Second National Economic Development Plan (1967–1971), extending compulsory education to the whole country, improving all types of schools, especially vocational schools, to be more in quality and quantity. Furthermore it has improved university quality and supporting the private sector to play a role in educating people at all levels. There are a growing number of vocational schools, while many schools have been promoted to colleges and the development of teaching to the high vocational level.

As a result of the expansion of education, at the end of the first economic development plan, there were 8 Technical Colleges under the Department of

Vocational Education and 27 teacher colleges in Bangkok and other provinces which were able to produce teachers at all levels including Bachelor level.

In addition to educational expansion, there was also an expansion of the industry sectors that was promoted by the government and led the economic growth. However, this expansion has led to the problem of graduates in fields that were inadequate or inadequate for national development. But the expansion continues, especially with funding from the United States to send people to study abroad and the United States itself has sent scholars to provide ongoing academic assistance. The sending of many Thai scholars to study in the United States was to support the establishment of educational college in 1954 to produce teachers same as America.

4) Educational Development after 14th of October 1973

After the 14 October until the end of 1977, despite frequent government changes, but there were still important developments such as the increasing number of educational institutions and increasing educational opportunities at all levels. In particular, higher education had set up two open universities; Ramkhamhaeng and Sukhothai Thammathirat and promoting the opening of private higher education institutions since 1969 onwards. Furthermore, extending the informal education and the elevation of teacher training from Prasarnmit College of Education to be the Srinakharinwirot University in 1974 which had a total of 8 campuses nationwide and made a lot of teacher productivity. A major turning point in 1984, with the amendment to the Teachers College Act 1975, allowed all teacher colleges to offer other courses besides teacher education. Later, in 1995, they were promoted from the College of Teachers to the Rajabhat Institutes. Then, when the Rajabhat University Act BE 2547 was enacted, the Rajabhat Institutes were elevated to Rajabhat University in serving various fields of study.

5) Education after the 1997 economic crisis

In 1997, Thai education was also experiencing a number of quality problems. It was reported that Thai people receive lower education services than their neighbors, which were important economic competitors, such as South Korea, Singapore and Malaysia. The government tried to support thoroughly education

services. However, the problem of mid-level manpower production in the vocational education had become increasingly apparent due to the value of the vocational education was not accepted and the popularity of continuing to higher education for Bachelor degrees after vocational graduation. These were causes of mid-level workforce shortage. At this time, international schools operation was increasing.

6) Educational Administration under the National Education Act BE 2542

Major changes in the management of education due to the enactment of the National Education Act, BE 2542. Especially in Section 9, which defined the key principles of educational management by providing a wide range of educational services. There was decentralization to local administrative organizations, educational area, and educational institutions. This Act emphasized on the system of education standards, the establishment of professional teacher's standards, mobilization of the resources for educational management and the cooperation in education by people or organizations in society. This was the law that came out to support the major educational reform of the country. Especially, the bureaucratic structural reform, the emergence of a new educational organization and the change from the Ministry of University Affairs to the Office of the Higher Education Commission.

The development as mentioned above, it was seen as covered by the National Education Plan. In the first stage, it focused on compulsory and vocational education services for people. Later, in the period of economic and industrial development (Pariyaporn Tangkanan, 2013), under the National Economic and Social Development Plan, the education set up by the National Education Plan was aligned with each National Economic and Social Development Plan, and it allowed for a wide range of educational arrangements and promoted a collaborative education networks between government, private and civil society.

In the early stages of the National Education Plan before the education reform under the National Education Act BE 2542, was the short-term plan. It was five years plan to accelerate the development of all levels and types of education to meet the needs of the country. Later, when the Constitution of the Kingdom of Thailand BE 2540 and the National Education Act BE 2542 were enacted, aligned

with the 20-year vision of the 9th National Economic and Social Development Plan (BE 2545–2549) and other relevant statutes (The Office of the Secretary of the Education Council, 2004), the National Education Plan (BE 2545–2559) was designated as a 15-year strategic plan to serve as a framework for the development of a five-year education development plan. This education plan had a special focus on integrated participation in encouraging all parties to join the network to implement the plan into action (Pimpun Thep suthatanont, 2006).

In 2017, the year of the National Education Plan BE 2545–2559, which was a 15-year long-term plan ended, the Ministry of Education (MOE) announced the new National Education Plan; the National Education Plan BE 2560–2579, which is a 20-year long-term plan to provide a framework and direction for the education of the country. The current National Education Plan continues to focus on promoting the participation of all sectors in organizing and supporting education to reduce government spending. Some important goals are to have an effective educational management system to develop students thoroughly and quality and a worthy investment in education and achievement that means efficiency. This plan is in parallel with other policies and plans that focus on developing workforces in matching to the demands of the labor market and national development which is driven to the digital economy and society, transforming to the industry 4.0 and to support the reform of the country under the new Thai Constitution, the development of the country under the 20-year national strategic framework (BE 2560–2579) and the 12th National Economic and Social Development Plan (BE 2560–2564) (Secretariat of the Education Council, 2017)

Therefore, in studying the development of education management, it should be study to overview of each National Economic and Social Development Plan since Thailand had the first National Economic and Social Development Plan in 1961 until the 11th Plan (Office of the National Economic and Social Development Board, 2017). The policies and plans related to the development of education, labors and human resources are as summarized in Table 4.1.

Table 4.1 Policies on education, human resources development and labor development in the 1st–11th National Economic and Social Development Plan

No	Education	Human resources development	Labor development
The 1st National Economic Development Plan (BE 2504-2509)	<u>First stage (BE 2504-2506)</u> Promoted vocational education specially for a professionally qualified in practice.		
	<u>Second stage (BE 2507-2509)</u> Created an accession system and the analysis of implementation progress in the project of the human development plan in comply with the economic development plan.		
The 2nd National Economic and Social Development Plan (BE 2510-2514)	Focused on the consistency between educational plans and workforce demand, quality promotion on private education institutes and improvement of technical fields of study which were needed to support social and economic growth		Developed higher quality workforce, especially rural areas, to meet the needs of the country's economic and social development. Increased vocational education workforces and skilled labors by education and training at all levels.

Table 4.1 Policies on education, human resources development and labor development in the 1st–11th National Economic and Social Development Plan (cont.)

No	Education	Human resources development	Labor development
The 3rd National Economic and Social Development Plan (BE 2515–2519)	Accelerated the production of shortage workforces such as scientists, engineers, teachers, doctors and nurses and improved the quality of education to meet the demands.		Reduced rural-to-urban migration and promoted the higher employment in the term of this plan by a specify employment policy.
The 4th National Economic and Social Development Plan (BE 2520–2524)	Provided non-formal education, especially vocational training and short-term training for producing new workforces, reducing the unemployed and supporting the disarmed soldiers to be skilled and could applied for jobs. Trained the employed workers for skills upgrade and increased income.		Balanced quality and quantity of the manpower needed, the existent workforces and in production manpowers. Encouraged careers development of labors in rural areas and upgraded skilled workers in urban area for higher wages. Improved the labor relations operation.

Table 4.1 Policies on education, human resources development and labor development in the 1st–11th National Economic and Social Development Plan (cont.)

No	Education	Human resources development	Labor development
The 3rd National Economic and Social Development Plan (BE 2515–2519)	Accelerated the production of shortage workforces such as scientists, engineers, teachers, doctors and nurses and improved the quality of education to meet the demands.		Reduced rural-to-urban migration and promoted the higher employment in the term of this plan by a specify employment policy.
The 5th National Economic and Social Development Plan (BE 2525–2529)	Encouraged private sector to invest in middle and higher education by providing more academic subsidies.		Provided careers in concordance with market needs and government's job promotion policies. Manpower production planned, job promotion standard specified, career prepared and continuing monitored, especially, in the vocational and higher education which should be operated concurrently with the improvement of organization administration.

Table 4.1 Policies on education, human resources development and labor development in the 1st–11th National Economic and Social Development Plan (cont.)

No	Education	Human resources development	Labor development
			Organized academic seminars among government agencies, public and private institutions, professional associations and private business associations to carry out the training of executives and business managers. Collected and disseminated information on career development and created the measures in supporting the training for industrial workforces' production. Controlled or assisted private vocational institutions for training quality to match with market needs. Encouraged educational institutions and professional associations in providing human resources development training courses for labors and students at all levels and cooperated by department of labor.

Table 4.1 Policies on education, human resources development and labor development in the 1st–11th National Economic and Social Development Plan (cont.)

No	Education	Human resources development	Labor development
The 6th National Economic and Social Development Plan (BE 2530-2534)	Supported for education and training for career such as the development of career guidance systems in educational institutions.	Accelerated the development of information and database systems for manpower planning such as human resources, employment, labors, labor markets development both domestically and internationally and education management to serve labor market needs.	Focused on labors' problem, especially, child labor protection. Supported to improve working conditions of child labor including increased welfare. Eliminated discrimination against female workers in terms of wages, working conditions, training, skills development, etc.
The 7th National Economic and Social development Plan (BE 2535-2539)		Organized education and training for high potential and capacity of human resources in various target groups. Increased the government roles in human resources development, quality of life and environment. Reviewed laws and regulations to be effective and facilitate the participation of the private sector in the development of human resources.	Expanded public-private cooperation in skills development training and funding training budgets by private sector. Polluter Pays Principle prescribed for pollution control.

Table 4.1 Policies on education, human resources development and labor development in the 1st–11th National Economic and Social Development Plan (cont.)

No	Education	Human resources development	Labor development
The 8th National Economic and Social Development Plan (BE 2540-2544)	Enhanced the quality of education at all levels as well as continuing to train all teachers.	Strengthen the potential of people namely physically, mentally and intellectually for ability to work and adaptable to the economic, social and governance changes.	Upgrades skills and knowledge to 25-45 years old workers. Reduced the risk and the number of accidents that would be occurred by traffic, chemical materials transportation and fires.
The 9th National Economic and Social Development Plan (BE 2545-2549)	Educational system and learning process reformed	Applied Sufficiency Economy Philosophy as a guideline for the development plan and proceeding from the 8th Plan on the concept of "People are the center of development" in all dimensions holistically. Focused on balanced development inn terms of people, society, economy and environment, especially, the creation of a good internal management system at all levels. This will result in sustainable development that is truly "people" centered.	Upgraded the standard of Thai people skills to be consistent with changed manufacturing and technology.

Table 4.1 Policies on education, human resources development and labor development in the 1st–11th National Economic and Social Development Plan (cont.)

No	Education	Human resources development	Labor development
The 10th National Economic and Social Development Plan (BE 2550-2554)	Produced a new generation to study vocational education by creating a parental network. Continuing provided social services in term of improvement and development of effective transfer system. Encouraged the chances of learning and inheritance local wisdom including natural resources conservation of the graduates who returned to domicile.	Prepared people and systems to be adaptable to the changes in the future and globalization. Helped to strengthen capability of all sectors by applying the Sufficiency Economy Philosophy to develop people concurrently the morality.	Developed skills and competencies of workforce to be accordant with market needs. Developed potential manpower for innovative creation and knowledge. Considered the measure to promote labors to work abroad and to attract foreigners to work in the country including the measure to support free flow of skilled labor.
The 11th National Economic and Social Development Plan (BE 2555-2559)	Developed the cooperation between the public and private sector for workforce development in all business sectors. Strengthened the standard of both public and private education institutes for internationally accepted and accredited. Upgraded and issued skilled labor standards.	Developed of Thai people and society towards a quality society. Strengthen capability from individual, family and community to be a quality society and to be participated in economic, social and governance development.	Built regional economic partnerships in human resources development, labor mobility and promoting Thai workers abroad by accelerating the cooperation in the international labor skills standards prescription, preparing to human resources development in terms of education, language, labor skill and also developing of mechanisms to support global economic integration.

According to 11 National Economic and Social Development Plans, it was found that in the first stage of the plan have focused on the development of the people by education and labor management systems to build more professional skills that support the industries until the 6th Plan in 1987, the government changed the development of people in the country in the form of holistic human resource development to the development of human resources information system and labor information system for human resource planning and to align the education system to the needs of the labor market. It reflected the development of education and labor in the first phase, as it is done in a different way, without the analysis of human resources in the system. The development of education and labor had to be carried out more consistently and it extends into the 7th Plan, which involved the private sectors in the development of human resources by improving the rules and regulations to be effective and conducive to the operation. The later plans, hence, the government has focused on the development of holistic human resources in every dimension as it was quoted "people is the center of development

For labor development, it was emphasized the need to balance the supply and demand of labor as well as the quality of labor, which was clearly evident in the 4th Plan (1977), by upgrading labor skills and employment including development of labor relations. However, balancing between labor supply and labor market needs remained unfulfilled over the five-year period of each plan, as it was evident that 5th plan and 10th plan still focus on the development of labor that must be handled in accordance with the needs coupled with encouraging private sector participation in labor development and focused on the skills of the labor force for the industrial sectors by upgrading the skill development and basic knowledge to the workforce in the 8th plan and developing it into the world of work and competition, economic change and international cooperation including trade integration and free flow of labor.

Apart from the total of 11 volumes of National Economic and Development Plan according to Table 4.1, it was also found that National Educational Plan (B.E.2545–2559) which was the long-term 15-year strategic plan and the first plan since the country had stipulated National Educational Plan covered the period following the 3 volumes of National Economic and Development Plan; 9th National Economic and Development Plan, 10th National Economic and Development Plan,

and 11th National Economic and Development Plan having the policies in developing the economy and society with the focus on various aspects differently in each plan. This included several occurring changes such as the notification on the enforcement of Constitution of Kingdom of Thailand B.E.2550, National Education Act B.E.2542 and being amended B.E.2545, and 10th National Economic and Development Plan (B.E.2550–2554) including the policies of the government at that time requiring to make the entire education revolution by restructuring the management, adjusting the curriculum, promoting the distribution of power for all sectors to participate in the educational management. There was also the monitoring and assessment of educational development results in the period of nearly 10 years. It was found that the operation in some issues had been successful. There were also some problems which must be hurriedly developed and improved unsuccessfully as well as having the new issues to be hurriedly developed (Office of the Education Council, 2011). This resulted in the occurrence of National Educational Plan, amended (B.E.2552–2559). In the plan, the management was stated to the action that this National Educational Plan focused on the plan to the action in order to reinforce the proposals of educational reform in the second decade. The focus was on 3 areas; the development of educational quality, expansion of educational opportunities, and the promotion of the involvement in the administration and management of education as well as considering the consistence with the period of National Economic and Development Plan.

4.1.2 Educational management and reform according to the National Education Act B.E.2542

For educational management and reform according to the National Education Act B.E.2542 (Ministry of Education, 2000), Ministry of Education had stipulated the reform plan following the 20 year-operational plan missions, appointed the Educational Reform Committees of Ministry of Education to be responsible for (15th July, 1999), and established the operating center for the educational reform of Ministry of Education (26th July, 1999). The important plan in preparing the workforce and develop the labors was the 4th plan: the plan for reforming the vocational study and vocational training and the 5th plan: the plan for educational management in university level (Ministry of Education, 2000; Ministry of Education, 2001; Office of the Education Council, 2006). The significant operations in each period could be summarized as follows:

Table 4.2 Education reform plan and operational plan

Operational plan	Operational approach	Benefits	Operational results		
			1 year anniversary June, 2000	16 month anniversary November, 2000	6 year anniversary 31 st December, 2005
Vocational reform and vocational training	- Draft Vocational Education Act. - Develop the pilot project in accordance with the approaches for vocational education reform.	- People and young people can enter the vocational education and training system thoroughly and continually. - The society involves in the management of vocational education and training, vocational service provision, and vocational education and training with quality following the society's demands - Vocational education act can help developing the network system on the cooperation between the educational institutes and the operational places with public sector and private sector.	- Meeting of Sub-committees on vocational education and training reform and the Committees on creating the draft of Vocational Education Act - Academic meeting, seminar, brainstorming from relevant persons from public sector, private sector, and operational place in the vocational education and training reform - Propose the issues and the main contents in proposing Vocational Education Act to the Education Reform Committees, Ministry of Education. - Study the variables for defining the service areas of vocational education and conduct the project of vocational institute network	- Draft of Vocational Education Act (proposed for the approval to the Cabinet) - Define the approaches on the reform of structure system, forms, strategic plan, action plan for the vocational education reform. - Operate the pilot project following the vocational education reform approaches.	- Conduct the plan, producing strategies, and development of workforces in vocational education and technology - Develop the vocational qualification - Develop the workforce strategies to increase the capacity in the country development - Study the form of vocational management in bi-lateral and multi-education of foreign countries - Develop the experience transferring system - Develop the professional standards - Develop the curriculum correspondent with the country's industry

Table 4.2 Education reform plan and operational plan (cont.)

Operational plan	Operational approach	Benefits	Operational results		
			1 year anniversary June, 2000	16 month anniversary November, 2000	6 year anniversary 31 st December, 2005
University study	- Encourage higher education institutions to develop the forms and methods of various educational management. - There is the curriculum development and evaluation system in correspondence with the higher educational reform model and higher education management for quality, standards, and academic excellence. - Develop technology for education and develop the information technology networks for higher education. - Encourage private sector to participate in educational management more.	- It is the reform of the entire system focusing on enhancing people to access to higher education. - People will be involved in the educational management more in various ways both in the curriculum, learning and teaching styles, or educational management at the higher education more.	- Conduct the conceptual framework for evaluating and transferring the higher education study results. - Conduct the conceptual framework for measuring and evaluating learners in higher education. - Conduct the conceptual framework for structuring and managing higher education, approaches for structuring the organization, powers, and duties of the Higher Education Commission - Draft the "quality assurance guidelines for higher education" which will be the policy recommendations to be implemented altogether.	- Conceptual framework for evaluating and transferring the higher education study results - Conceptual framework for measuring and evaluating learners - Conceptual framework for structuring and managing higher education.	- Reform the higher education structure and management system and draft the Community College Act - Conduct the strategic plan for implementation of Ministry of Education in relation with higher education. - Conduct the production plan and plan for human resource development in correspondence with country development. - Encourage and promote private sector to participate in higher education management in the country. Organize the system to develop the networks of higher education institutes.

The results of such educational reforms influence the development of educational management in vocational education. The primary consequence comes from National Education Act B.E.2542 with the major educational reform of the country. This resulted in the changes in the bilateral vocational education management system during 2002–2007 with the curriculum reform in the academic year of 2002. Ministry of Education notified the use of vocational certificate curriculum in 2002 and in the academic year of 2003, the curriculum of 2002 (amended 2003) was notified. The higher vocational certificate curriculum was notified in 2003. Such curriculum has changed the period of training into the curriculum to promote the coordination in the educational management together with relevant agencies and organizations both from public and private sectors. Therefore, the learning management following the new curriculum is focused on learning with the operation places focusing on the cooperation with the operation places. The real practice is emphasized in order to be able to apply the professional and classroom subjects to study and practice in the operation places (On the job training). There are 2 types; job training in the operation places for not less than 1 semester and bilateral or half-curriculum training in the operation places for not less than 3 semesters in the vocational study level and 2 semesters in the higher vocational study level (Office of the Vocational Education Commission, 2014).

From enacting the Vocational Education Act B.E.2551, the existing form of vocational education was changed under the provisions of Section 8 of the Vocational Education Act B.E. 2008 which requires vocational education management and vocational training in 3 forms; formal education, non-formal education, and the bilateral education system. It is the vocational management resulting from the agreements between educational institutes or institutes and the operational places, state enterprises, or government agencies in the curriculum management, teaching, measurement and evaluation. The student takes sometimes in the vocational education institution and practices in the operational places, state enterprises, or government agencies.

In terms of higher education management, in 2002, Office of Higher Education Commission organized the cooperative pilot project with the support in budget until 2004. However, the support still exists in policy until now. More higher education institutes participate in arranging the cooperative education with more students and operational places.

The storage of information on the relationship between cooperative education and the work of the learners is still not very comprehensive. There is not much information in quantity but it is the small piece of information provided by the cooperative education institutes involving many other environmental factors. However, the cooperative education is one of the operations representing the progress in the plan requiring the private sector to participate in higher education in the country. The development is likely to be good and there is the broader network of integrated education, learning and working.

4.1.3 Development of labor forces in the automotive industry

Apart from the main mission in preparing the labor forces of Ministry of Education stated from the development in education, the study from both primary and secondary documents on the preparation of manpower in the automotive industry, it was found that the studies and research have been conducted as well as planning for the establishment of institute by many relevant government agencies as the automotive industry is very high potential group generates revenue for the country in high volume. Each government has the policy to enforce and develop the automotive industry continually. The development of labor and manpower into the industry is part of the automotive industry development plan with the plans/projects/activities to develop the labor in operating the significant automotive industry development. The policy of the automotive industry development causing major turning points in the development of the automotive industry and changing the systems and structures of the labor in the automotive industry development which has been reputed nowadays is to go towards being the base of automotive manufacturing in Asia or Detroit of Asia Project in the government period of Pol. Lt. Col. Taksin Shinnawatra causing several agencies especially Ministry of industry and Ministry of Labour to accelerate developing the manpower and prepare the labor force at the moment to support the expansion of such industry. From studying the development of each agency, the results of the development of workforce and the efficiency of labor in the industry can be summarized as follows:

4.1.3.1 Development of Ministry of Industry

From studying the documents of Ministry of Industry, namely, Master Plan of Automotive Industry B.E.2545–2549 (Automotive Institute, 2002), Master Plan of Automotive Industry B.E.2550–2554 (Automotive Institute, 2009), Master Plan of Automotive Industry B.E.2555–2559 (Automotive Institute, 2012), Master Plan of Thai Industry Development B.E.2555–2574 (Ministry of Industry, 2011), and the documents of Detroit of Asia Project of the Department of Industrial Promotion (Chakphorn Unchit, 2005), it is found that Ministry of Industry Detroit of Asia has the interesting development on education and training to prepare the manpower for the automotive industry. Especially in the year 2002, the government at that time initiated the vision of being Detroit of Asia with the automotive industry as one of the five major industries of the country. The Detroit of Asia Project started from 2004 to 2010 to enhance the competitiveness of the Thai automotive industry. Ministry of Industry assigned the Automotive Institute to study and conduct Master Plan of Automotive Industry B.E.2545–2549 which is the first master plan for the automotive industry defining Thailand's automotive industry vision for 2011 that "Thailand is the automotive manufacturing base in Asia. It can create the added value to the country by having the strong automotive parts industry." Such master plan proposed 13 projects for the automotive industry development. Most of them have to be operated in cooperation with many agencies under the Ministry of Industry and outside the Ministry of Industry. Therefore, the “Automotive Strategy Committee” was established to be responsible for managing the projects under the master plan for the automotive industry. The competitiveness enhancement includes 4 plans and projects under the plan. One important plan is the plan on capacity building consisting of engineer producing projects (universities), technician producing projects (vocational study), and labor skill development projects (Department of Skill Development).

However, there have been the collaborative efforts in studying to solve the problem of labor shortage in the automotive industry at the time, for example:

- (1) International Automotive Engineering Degree Project in 2005 by Chulalongkorn University

(2) Curriculum of High Vocational Study of Automotive Industry Technical College in 1999 with the cooperation between Department of Vocational Education and Honda Group in Thailand. There are also the colleges providing the short-term study for those who work in the industrial sector having the chance to accumulate the credits and transfer the experience for receiving the certificates.

(3) Development project on human resources capacity serving system in the automotive industry which is the standardized project to certify personnel competency along with the development of training courses and training for personnel to be coaches in Stamping, Plastic Injection, Casting and Machining. This is contributed by budget support from public and private sectors as well as the cooperation between industrial and academic sectors. The industrial sector gives the academic assistance, curriculum development, teacher development including providing advice and assistances in establishing related laboratories and research centers.

Based on the study of the 3 master plans of the automotive industry having the first two in the period of project operation of Detroit of Asia, namely, Master Plan for Automotive Industry B.E. 2545–2549 and Master Plan for Automotive Industry B.E. 2550–2554 and the 3rd master plan, Master Plan for Automotive Industry B.E. 2555–2559 conducted after the period of such project and having the assessment on the Detroit of Asia project as well, it is found that Master Plan for Automotive Industry B.E. 2545–2549 was conducted for directing the automotive industry development in the next 10 years by stipulating the strategies, measures, and action plans for the automotive industry development in accordance with the National Economic and Social Development Plan Vol. 9 (B.E. 2545–2549).

Based on such first master plan, the development on personnel relevant to the automotive industry is in 2 dimensions; from academic institutes which are universities and technical colleges and the training service provision, it is found that from the total of 72 universities at that time, there were more than 34 universities in which the Faculty of Engineering has the program of industrial engineering and machine engineering divided into 17 public universities and at least 17 private universities. Only one university with the program of automotive engineering was Chulalongkorn University. Meanwhile, among 413 technical colleges, 300 colleges provide the program of engine technician. The problem occurring at that time was that

some operators considered that the curriculum focused more on theories than practices causing the unnecessary time consumption in studying some parts of work in practices such as in manufacturing.

Regarding training, there is training for over 350 courses divided into two major areas; engineering and management. It is spread in various training institute including the Automotive Institute, Office of Technological Development for Industry under King Mongkut's Institute of Technology North Bangkok, National Metal and Materials Technology Center, Thai-German Institute, Institute of Industrial Technology Research and Development, Kasetsart University, Maintenance Technology Center, Science and Technology Research and Service Office, Thonburi King Mongkut's University of Technology, Material Properties Analysis and Development Center (MPAD), and Thailand Productivity Institute. The discovered problem is that there is still the shortage of coordination between the agencies providing the training service, shortage of public relations causing some industrial sectors not to know the training information and shortage of some courses demanded by some particular industries.

In this master plan for automotive industry, the roles of the industrial groups and organizations both public and private, educational institutions, universities, specialized institutes, and other business groups involved in capacity development are discussed that many roles and responsibilities are still overlapped such as the role of personnel development, roles and duties in product development as well as the role of the government. Thus, the plans and projects mainly responsible by the government still require the coordination from coordinated agencies. It is important to determine the roles of each organization especially for the organizations which will serve as the main unit for the automotive industry development including adjusting the roles and corporate reform in both public and private sectors to be not mutually exclusive and can work together in the same direction. In addition, organizations and agencies in both the public and private sectors responsible in the industrial development must have high potential and agility to perform their roles and responsibilities.

The strategies in human resources development for the automotive industry under this master plan focus on studying the measuring system, defining the criteria for personnel competence, proportion of exchange of foreign

employees and Thai employees, finding the persuasive measures for training and personnel development such as training expenses deductible for corporate tax and individual tax. There are some interesting plans such as **the establishment project of the training center for personnel development of the automotive industry**. The main agency is Office of Industrial Economics and Automotive Institute. Other involving agencies are Department of Skill Development, Federation of Thai Industries and academic institutes for training and personnel development in the automotive industry from the employees to the executives, enhancing the craftsman skills, and training the engineers to have engineering competence and specialized technology capabilities in automotive development project. The main agency is Ministry of University Affairs and the involving agencies are Automotive Institute, National Metal and Materials Technology Center, Thai-German Institute, and Federation of Thai Industries. The bachelor degree development program is stipulated to be ready to work in the industrial sector together with higher education institutes to provide the scholarships to students in cooperation with the industrial factories during the pilot projects.

The student competence is assessed mutually between the institutes and the factories. The project is to develop the accreditation system for personnel in the automotive industry. The main agency is Ministry of Labour and Social Welfare (Department of Skill Development) and the Ministry of University Affairs. The involving agencies are Department of Industrial Promotion, Automotive Institute, Federation of Thai Industries, National Metal and Materials Technology Center, Thai-German Institute. The curriculum is set for personnel development both in management and technology to train the teachers to have the ability to teach and set the certification system to certify the skills.

For Master Plan for Automotive Industry B.E. 2550-2554 which was the 2nd master plans conducted as the guidelines for developing the strength to the automotive industry and automotive parts, the objectives related to personnel development is that the personnel in the automotive industry must have international capabilities both in the management of automotive business and in the development and production. The Thailand's automotive industry vision for 2011 is defined as, "Thailand is the automotive manufacturing base in Asia which can create

the added value to the country with the strong automotive part industry". The strategies in human resource development both in the management and the manufacturing for the entire industry are the forcing power of Human Resources Thrust. There are 2 action plans; plan of human resource development in the industrial sector with the development approach which is the implementation of **Automotive Industry Human Resources Development Programs (AHRDP)**. The implementation is cooperated and supported by the Japanese government together with Toyota, Honda, Nissan, and Denso in developing the human resources in Toyota Production System (by Toyota), Manufacturing Skills (by Denso), Mold & Die (by Honda), and Skill Certifications (by Nissan) with the development plan of teachers who will work on the development of continuous expansion to identify the needs for personnel development in the automotive industry entirely and systematically both at senior management level, middle management level, and the workers in the entire organization. This will be the information in designing personnel development programs in the automotive industry with the foreign experts who have experiences in similar developments or with the development system that can be a role model in the cooperation between private sector and educational sector–public sector to develop training programs and activities. The strategies for developing teachers and related academic institutes can be beneficial for developing the graduate development to implement human resource development in correspondence with other strategic activities in this master plan for maximum benefits in studying the human development model of the successful automotive industry in this field including Japan, the United Kingdom, and Germany. Relevant academic institutes are developed for continual training and services along with the creation of accessible knowledge and efficient utilization. Another plan is the **development plan for personnel production in education sector** from the issues encountered by the automotive industry as well as the quality of the graduates to have knowledge, competences and skills which are not of standard. This plan is formed to improve various levels of education relevant to the automotive industry at the diploma, undergraduate and graduate levels, and the quality of learning in these courses. The development approaches are the cooperation by public sector, private sector, and educational sector to improve relevant curriculum at all levels and in teaching. The technical colleges are developed aiming to provide

the skills needed to train the essential skills for the automotive industry including teacher development by participating the industry. The training program of the students in the industry can develop the engineering competence of the students by the apprenticeship and the **implementation of research in the project in cooperation between the private sector – educational sector – research center**. The educational sector participates in the AHRDP program to enhance the skills in the industry.

Moreover, for the master plan to achieve the defined goals, the establishment has been proposed for “National Automotive Industry Development Committees” to govern the approval and direct the development plans. These Committees should consist of the top executives from the public sector and the experts as the committees having Minister of Industry as the President of the Committees. There are sub-committees to monitor specific areas which are the sub-committees on human resources development, the sub-committees on technological researches and development, the sub-committees on the development of part manufacturers, and the sub-committees on the government policies. The factors leading to the success of such master plan are the government’s policies related to the development of automotive industry which is systemic/coherent, synergistic, responsive, strategic, transparent, consistency in Long-Term Plan, Speed of Development, and the serious Collaboration of public sector, private sector, and educational/research sectors.

After the period of Detroit of Asia Project has been terminated as planned, Master Plan for Automotive Industry B.E.2555–2559 which is the 3rd master plan conducted after terminating the operational period of Detroit of Asia Project, Master Plan for Automotive Industry B.E.2545–2549 and Master Plan for Automotive Industry B.E.2550–2554 define the vision of Thai automotive industry in 2011, “Thailand is the automotive manufacturing base in Asia which can create the added value to the country with the strong automotive part industry”. This master plan defines the vision in the next 10 years of Thai automotive industry of 2021, “Thailand is the automotive manufacturing base of the world together with supply chain creating the added value to the country and being friendly to the environment.”

This master plan assesses Master Plan for Automotive Industry B.E.2550–2554 in targeting human resources with the international

competence that the human resource development in the industrial sector. Ministry of Industry has granted the Automotive Institute to be the major agency in the development of personnel in the automotive industry by joining with car manufacturers and Thai auto parts manufacturers in the development of personnel in the industrial sector with increasing knowledge, skills and abilities with the cooperation from Japan under the project of Automotive Human Resource Development Project (AHRDP) to transfer necessary technology with the standards focusing on the knowledge development, namely, in 4 areas; Production system, Mold & Die, Mind Management & Skill Manufacturing, and Skill Certification. The main development is mainly in the operator level. The personnel development in the educational system to supply personnel into the industry has not been seriously operated. There is only the cooperation between car makers and some educational institutes in the production of maintenance personnel which is named automotive technician as most educational institutes provide the general courses of study openly to future career selection. However, some institutes have offered direct education in automotive engineering but not many. This strategic plan following this master plan focuses on the main strategies of excellence especially the excellence in the Human Resources Development to elevate the skills of skilled workers, high-skilled workers and engineers as well as talented management personnel in the automotive industry including the strategic plan to develop the capabilities of the entire automotive industry from the integration of personnel development system related to the curriculum and the education system to the development of skilled and unskilled labor including networking to develop human resources with both domestic and foreign organizations in agreement with the changing trends and expansion of the automotive industry in the future. This strategy of excellence is linked to the creation of a good environment through infrastructure to support this personnel development plan which plans to set up a human resources development center of the automotive industry aiming to create a good environment with the availability of infrastructure factors for the expansion and development of the automotive industry in correspondence with the guidelines for the development of skilled labor to improve production efficiency and support future technologies under Master Plan for Thai Industrial Development B.E. 2555–2574.

In creating the excellence in the human resource development, there are important operational approaches such as to conduct the automotive human resources development plans to establish a long-term perspective, explore the curriculum to improve the ability of personnel to the automotive industry (Standard Academic & CPD Curriculum) by academic cooperation with both domestic and foreign educational institutes including the private sector to develop and improve the curriculum to meet the industrial demands (at present and in the future), create Automotive Human Resources Development (AHRD) Operating Work System, develop personnel at all levels both skilled level, supervisor level, research and development engineer level by integrating with relevant agencies in the development of personnel in the automotive industry to sustain the entire system, create the knowledge for the expansion including the creation of standard curriculums and guest speakers as well as the cooperation of experts pool to specialize in the development of various personnel, creating a network of cooperation for the personnel development in the automotive industry (Networking for AHRD Single System) integral with public agencies, education and private sectors consisting of the significant plans/projects including **human resources development project in the automotive industry towards sustainability** and the **cooperation project with educational institutes to develop personnel in the establishment** both already working and the new comers through Continuing Professional Development (CPD) to develop students who are going to graduate or freshly graduated students through the preparation course before entering the automotive industry. The main responsible agency is Ministry of industry and related agencies are Ministry of Industry (Office of Industrial Economics, Department of Industrial Promotion, and Automotive Institute), Ministry of Labour (Department of Skill Development and Skill Development Institute), Thai Auto Parts Manufacturers Association, Federation of Thai Industries, Institute for Higher Education and Vocational Education and professional qualification institutes.

Ministry of Industry has put the plan into action by proposing a plan for the development of the automotive industry sustainably for the approval of the Cabinet. Such automotive industry development plan does not have only Sustainable Automotive Development Project B.E. 2555–2564 (10 years) but there are also the projects for the development of automotive testing center in 2012–2014 included in

such plan. The Cabinet voted in principle on 14th March, 2011 (the Secretary-General's Office, 2011).

However, the Cabinet considered that the plan should formulate an integrated strategy with potential and targeted private educational institute with clear indicators for each strategy to achieve mutual cooperation and responsibility of responsible agencies both public and private. Regarding the budget, as the proposed cost frame is relatively high, the economic suitability should be analyzed together with the cost-effectiveness of investment, suitability of the period, details of the action plan, and responsible agencies to avoid duplication. The private sector may be considered to involve by using public-private partnerships (PPPs). In addition, Ministry of Finance also suggests for such plan that as the budget of infrastructure investment is quite, the operators should be involved in both investment and technical assistance (testing centers), with the government as an administrative unit to ensure neutrality in service provision and fairness in competition among the operators (Office of the Secretary-General, 2011). Meanwhile, Ministry of Foreign Affairs suggests that in order to spend the budget economically and cost-effectively, there should be the persuasive measures for the private sector to participate widely including the coordination with private or public sectors in foreign countries having the stakes in the investment in the automotive industry in Thailand directly for supporting the technological transfer, training of employees/labor, personnel in the vocational institutes (same as the case of Japan) to create the sustainable development in the automotive industry to reduce the dependence on the budgets of the public sector in the long term. Ministry of Science and Technology suggests that the plan should be coordinated and established as a network because many government agencies already have the potential and readiness in some matters. The program development and management must emphasize multinational companies to invest in Thailand to get involved in curriculum design including the collaboration between educational institutes and private companies to provide students with practical work experience during the instruction.

Currently, the automotive personnel development project and the establishment of the automotive information center is continually processed especially the automotive personnel development project with the cooperation from transferring

some relevant technics from operational private institutes in some types of training programs under the operation of the Automotive Institute Including TPS programs, Mind Management & Manufacturing Skill programs, ISO/Productivity programs, system accrediting personnel competence in the automotive industry, and general training programs divided into Public Training and In-house Training. The programs will be developed and published on the website of the Automotive Institute annually (data derived from the survey of the Automotive Institute website www.thaiauto.or.th on 14th June, 2017).

Moreover, the 3rd Master Plan is still in the same timeline as the Master Plan for Thai Industrial Development B.E. 2555–2574. The vision of the Master Plan is "to move towards a stable and sustainable creative industry". The strategies related to labor development are the strategies to elevate the Enhance competitive industry platform. The target is in 3 periods. The first 1–5 years will be for providing and developing qualified personnel in the sufficient quantity/quality. The second phase of 5–10 years will be to raise the level of personnel to be recognized in the regional level. In the third phase of 10–20 years, the personnel will be elevated to be globally recognized by improving personnel potential (Industry Specific Training Development Program) focusing on the development of the labor force to have the knowledge, skill and quantity sufficient for the growth of the strategic industry in the future. The government agencies must support the development of human resources in the industrial sector together with the education sector for developing personnel to have a competitive workmanship at international level. There are different development factors in each industry based on the concept of learning alongside the actual work in the establishment including the supports on the research development which really responds to the needs of industrial enterprises. With the Industrial Training for specialized personnel by the cooperation between various institutes, government agencies, and private enterprises, the link can be created to the specific skills needs of the workplace with vocational training.

This master plan sets out the guidelines for pilot industry development (automotive and parts industry) which are in the high-value labor force responding to the key national policies and to become the potential industry with steady growth. However, the problem is that the proportion of investments and shareholders in this

industry is mainly foreign investment. Therefore the automotive industry is Thai industry playing the role as the manufacturing following the trademark owner which is the cross-country companies to invest. It is necessary to create the labor force and structure to promote the readiness to attract the investment from foreign countries continually as well as expanding to the promotion on the development of the automotive parts industry and the promotion on the use of domestic raw materials rather than importing from abroad. There are many problems and obstacles in the development of the automotive and auto parts industries such as the lack of clear direction for the development of automotive technology causing the education and research curricula of educational institutes in Thailand not to meet the industry's demands, shortage of skilled workers at all levels especially plant mechanical skills, engineers and product researchers, the quality problems of current workmanship, shortage of skilled electronics workers in the automotive industry, lack of skill certification and lack of clarity in work and coordination from many government agencies as well as the coordination between Office of Industrial Standards and Department of Land Transport in the test of automotive parts for certification, approaches of workforce development and labor skill enhancement for improving productivity and support future technologies. It is necessary to raise the skill level in all fields in order to elevate the productivity and create the competitiveness globally. Apart from accelerating the current labor skill shortage, it will need to set the skills development approaches to support future automotive technology to encounter more high technology as well. The building of cooperation network between academic and industrial fields will enable the industry to communicate the labor skills requirements to educational institutes for developing the joint curriculums and jointly assess the curriculum quality and the graduates for future labor development. For building the stability and career advancement for workers, it is therefore necessary to develop career path clearly in order to make the skilled labors know that their careers are stable and can be developed to solve the problems of attitudes of the labors as well as creating the standards of skill certification with the cooperation of Ministry of Labour, Ministry of Industry, Ministry of Education, and industrial sector. The created standards will be acceptable from all sectors and the labor costs will be defined suitably for the knowledge and competence of the labor to create the stability in the career and more career advancement.

4.1.3.2 Labor development by Ministry of Labour

Ministry of Labour is one of the agencies playing the important role in developing the labor efficiency and preparing the workforce to the industrial sector. The main responsible office is Department of Skill Development having the vision, “Workforce with world class competency” and the mission of Department of Skill Development in relation with the cooperation between the public and private sectors of “promoting the participation and building the network of labor skill development” as stated in the Strategic Plan of Department of Skill Development B.E.2555–2559 (Department of Skill Development, 2011).

Due to the document study of Master Plan for the Development of Skill Standards for Skill Improvement (Department of Skill Development, 2013), it is found that the Department of Skill Development has initiated a new role (from 2014 to 2015) in the operation. The Department of Skill Development is the main Human Resources Development Authority that is the major labor forces of the country especially those who have graduated from the academy and are in the working world as National HRD Agency. The first mission-driven process is to create a bilateral, multi-trilateral human resource development network that focuses on generating results that benefit workers and businesses with clear target. Regarding the skill development to workmanship standards, it is needed to accelerate the development of national skill standards to cover the major occupations of the country and encourage business operators to standardize their workmanship and employ skilled workers accredited by the national skill standards. This is considered a major production of the Department of Skill Development empowered by the provisions of laws, namely, Skill Development Promotion Act B.E.2545 and Skill Development Promotion Act (Volume 2) B.E.2557. In Section 38 of such act., “**Skill Development Promotion Commission**” is required consisting of the Permanent Secretary of Labor as the chairman, Representative of Ministry of Finance, Representative of Ministry of Tourism and Sports, Representative of Ministry of Science and Technology, Representative of Ministry of Education, Representative of Ministry of Industry, Representative of Budget Bureau, Representative of Office of the Board of Investment, Representative of the Board of Trade of Thailand, Representative of the Federation of Thai Industries Representative of Thai Bankers'

Association, and the representatives of the Federation of Thai Industries and other six directors appointed by the Minister from the experts for two persons, from the representatives of occupational organization for two persons, from the representative of the employer for one person, and from the representative of the employee for one person. The Director-General of the Department of Skill Development is the director and secretary having the government officials in Department of Skill Development as the assistance secretary responsible for conducting the national standards of labor skills in various occupations to promote the operators to employ the persons passing the test for the standards of labor skills or the certified persons of knowledge and competence to perform the operation in the operating places. The promotion is on the establishment of labor training center, labor skill standard testing center, and center of assessment on the knowledge and competence. The labor skill contest should be promoted along with the promotion on the coordination between the public and private sectors in developing the labor skills and the mutual use of resources.

The main activities of the Department of Skill Development can be divided into 8 activities as follows:

- (1) Prepare Master Plan on the skill standards and quality assurance.
- (2) Prepare Master Plan on the enforcement of certification of knowledge and quality assurance
- (3) Define national labor standards and test the standards of labor skills.
- (4) Define the skill development curriculum in accordance with skill standards.
- (5) Define rules and procedures for performing standard skill test.
- (6) Define the criteria and methods for assessing knowledge and competence.
- (7) Accredite the training centers, testing centers, assessment centers, and other centers belonging to the network.
- (8) Link the labor skill standard system with professional qualifications system and national qualifications framework

The Relations between the Department of Skill Development, Thailand Professional Qualification Institutes, System of Professional Qualifications and National Qualifications Framework.

However, the work of the Department of Skill Development is not enough to develop the entire workforce across the whole system. The government then has set up the development on the professional qualification system and the development on vocational standards in the education reform of the National Education Act B.E.2542, to the establishment of the Institute of Professional Qualifications in 2011 with the objectives to develop the manpower to meet the needs of the labor market more. This will lead to the increasing competitiveness of the country. The main missions cover research, development and professional qualification systems, encouragement and support on professional groups or vocational groups to develop career standards, accreditation including monitoring and evaluation of organizations that certify individual performance standards. It is the information center about the professional qualifications system and professional standards, promotion and coordination with educational institutes, training centers, establishments, public and private agencies to disseminate qualifications and professional standards.

Such development on professional qualifications system leads to the development on National Qualification Framework (NQF) approved by the Cabinet on 8th January, 2013. The Secretariat of the Council of Education will be the main bureau for the implementation of National Qualification Framework, arrangement of workshop with Ministry of Education and other relevant agencies such as Ministry of Labour, Ministry of Industry including the private sector by integrating the linkages of the nine levels of education in line with the country strategies. The study report on conducting the master plan for the development of skill standards in order to elevate the skills to international standards will contain the analysis on the preparation of labor skill standards in correspondence with the professional qualifications system of Thailand Professional Qualification Institute (Public Organization) interestingly that there is a lack of legal clarity how the professional qualifications system and standardized workmanship system can work in order to avoid the overlap between the two missions. However, even still lacking legal clarity,

Department of Skill Development should find ways to work together as a collaborative network in order to be able to work on the standard of workmanship and not to overlap which will lead to ineffective use of the mission budget. When considering coverage and legal provisions, it is clearly seen that the skill standards system of Department of Skill Development is the main standard of the country especially when considering the world of work due to other laws such as labor protection laws, the regulations of the Office of the Prime Minister on Labor Development and National Vocational Training Coordination B.E.2552, Revenue Code on Benefits and other laws related to labor management referred to the “Skill Standards” mainly by comparing the operations of the two agencies as follows. (Department of Skill Development, 2011).

Table 4.3 Comparison on the operation of Department of Skill Development and Thailand Professional Qualification Institute

	Department of Skill Development	Thailand Professional Qualification Institute
Standardization	1. Labor skill standardization based on competencies can be classified in 3 types as follows: 1.1 National labor skill standards 1.2 Labor skill standards of workers By promoting/ supporting to provide advices to public and private agencies in preparing the labor skill standards 1.3 Labor skill standards for those who wish to work abroad 2. Preparation of labor skill development curriculum based on competency in line with skill standards.	1. Preparation of professional qualifications and professional standards by promotion/support of professional groups or vocational groups in the preparation. Professional standards

Table 4.3 Comparison on the operation of Department of Skill Development and Thailand Professional Qualification Institute (cont.)

	Department of Skill Development	Thailand Professional Qualification Institute
Labor skill test	1. Labor skill standard test for the labor 1.1 National labor skill standard test 1.2 Labor skill standard test following the demands of the operating places 1.3 Labor skill standard test in finding workers to work abroad. The agencies performing the test on labor skill standard can be classified into 2 types; (1) Regional labor skill development institute, provincial labor skill development center, and working group of service industry (Labor College) under the supervision of Department of Skill Development for 78 offices nationwide (2) Labor skill standard testing center (private) which is permitted to operate the test on labor skills from	1. Accreditation of person's competences according to professional standards by allowing the organizations accredited by Thailand Professional Qualification Institute to certify person's performance according to professional standards.

Table 4.3 Comparison on the operation of Department of Skill Development and Thailand Professional Qualification Institute (cont.)

	Department of Skill Development	Thailand Professional Qualification Institute
Training	1. Skill training for workers in the workplace and informal workers. The bureaus operating the training are divided into two types: 1.1 Regional labor skill development institute, provincial labor skill development center, and working group 78 service sectors (labor colleges) in the supervision of Department of Skill Development 1.2 Labor Skill Training Center registered as the trainer under the Skill Development Promotion Act B.E.2545. Knowledge and Competence Assessment divides into 2 categories as follows: 1.1 Center for Knowledge and Competence Assessment which are 77 Regional Skill Development Institutes and Provincial Skill Development Centers which are the agencies under the supervision of Department of Skill Development nationwide 1.2 Center for Knowledge and Competence Assessment which are professional organization or public agencies accredited by Department of Skill Development to be the Center for Knowledge and Competence Assessment	

Table 4.3 Comparison on the operation of Department of Skill Development and Thailand Professional Qualification Institute (cont.)

	Department of Skill Development	Thailand Professional Qualification Institute
Accreditation	1. Accreditation of knowledge and competence for workers in the occupations, jobs or positions that may be harmful to the public. The Center for Knowledge and Competence Assessment divides into 2 categories as follows: 1.1 Center for Knowledge and Competence Assessment which are 77 Regional Skill Development Institutes and Provincial Skill Development Centers which are the agencies under the supervision of Department of Skill Development nationwide 1.2 Center for Knowledge and Competence Assessment which are professional organization or public agencies accredited by Department of Skill Development to be the Center for Knowledge and Competence Assessment	1. Accredited the organizations that are responsible for certifying the individual performance according to occupational standards.
Promotion/monitoring/supervision	1. Promotion/development of skills in the workplace	1. Promotion and support professional groups or vocational groups to develop career standards. 2. Monitor and evaluate the organizations responsible for accreditation of occupational standards.

Table 4.3 Comparison on the operation of Department of Skill Development and Thailand Professional Qualification Institute (cont.)

	Department of Skill Development	Thailand Professional Qualification Institute
		3. Promotion, support and coordination with educational places, centers, or institutes training on the establishment, government agencies, and private organizations in disseminating professional qualifications system and professional standards.
Research and development		1. Research and development on the professional qualifications system 2. Information center on professional qualifications system and professional standards
Skill Development Promotion Act B.E.2545	1. Labor skill training operation 2. Preparation of national skills standards in various occupations. 3. Provide the test on labor skill standards and promote the test on labor skill standards 4. Provide labor skill development fund 5. Establish skill training center and skill testing center 6. Promote the labor skill competition 7. Encourage all sectors of public and private to participate in the labor skill development	

Table 4.3 Comparison on the operation of Department of Skill Development and Thailand Professional Qualification Institute (cont.)

	Department of Skill Development	Thailand Professional Qualification Institute
Benefits to labor	1. Grant the opportunity for those who accumulate work experience to know their skill levels, their ability and attitude to work and develop themselves to higher standard as well as increasing their income and career advancement. 2. The job seekers who have passed the National Skill Standard test can use the certification of standards as the document for both domestic and international applications to increase the chances for getting a job because the employer will believe in it. 3. Those who pass the National Skill Standard test can increase their chances of getting paid according to skill standards in the occupational field as specified by Ministry of Labour. 4. The dismissed employees or job seekers can be used as a tool to measure their skill level and abilities before further training.	1. Elevate the learning value and professional experience of Thai labors to be internationally recognized 2. Create fairness for the labor force in the careers.

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Table 4.3 Comparison on the operation of Department of Skill Development and Thailand Professional Qualification Institute (cont.)

	Department of Skill Development	Thailand Professional Qualification Institute
Benefits to workplace	1. The establishment can use National Labor standard as a tool for planning, hiring, and defining organizational structures including increasing employee salary. 2. Employment for those who have passed National Skill Standard can reduce the problems or damage in the manufacturing process or services, save costs, and acquire product /service with quality to enhance the credibility of the establishment in the views of consumers.	1. To develop the career and create acceptance in business and industry to increase competitiveness of the country
Benefits to the consumers	1. Consumers or users of skilled labor services can work with quality, accuracy, fairness and reliability	
Benefits to public sector	1. The labor skill standards can be used in selecting the people for the recruitment and plan for workforce	

Table 4.3 Comparison on the operation of Department of Skill Development and Thailand Professional Qualification Institute (cont.)

	Department of Skill Development	Thailand Professional Qualification Institute
Benefits to the country	1. The skilled labor having been passed the labor skill standard test can participate in the economic and social development of the country to be competitive to other countries. When the skilled labor of the country is accepted, it will result in various aspects such as the demands of investment of the foreigners, the export of quality product, etc. When the entire economy of the country is improved, it will result in the labor to get paid at the fair rate, live well, eat well. The society can be peaceful and the nation can be stable.	1. Build the link to the professional qualification standards to be internationally accepted.

By comparing the roles, missions, authorities, and duties and responsibilities of Department of Skill Development and Thailand Professional Qualification Institute, it is found that the missions of Department of Skill Development and Thailand Professional Qualification Institute are similar. Professional and / or workmanship standards should be integrated between Department of Skill Development and Thailand Professional Qualification Institute to enhance the level of professional standards and to transfer to the educational institutes to develop the curriculum that are in line with professional standards and labor skill standards (Department of Skill Development, 2013).

4.2 Development the cooperation between the government and private sector

The cooperation between the government and private partnerships are in the following scope

In the beginning, the cooperation between the government and private sector was encouraged by the private sector's role and participation in national development. Established as a joint government or private committee, the shape became apparent in 1981 by General Prem Tinnasulanon's government to promote trade and investment within the private sector within the country (Government House, 2015). The reason of established a joint government and private committee was to tackle economic problems by the Cabinet on 30 June 1981, chaired by the Prime Minister and assigned the Office of the National Economic and Social Development Board or NESDB to act as secretary. The directors from the government will be composed of economic ministers and head of relevant government agencies. The private sector committee is comprised of representatives from three institutes, the Chamber of Commerce of Thailand, The Federation of Thai Industries and Thai Bankers' Association.

For cooperation in educational management and labor development can be summarized as follows

4.2.1 Development of vocational education; School-Factory based Education Project (Dual System) in 1984–1994 (Office of the Vocational Education Commission, 2014)

The Vocational Management of the School-Factory Project is purposed to train skilled artisans to meet the needs of the manufacturing and save the government budget. In 1984, the Department of Vocational Education (The name of the agency at the time) was granted technical assistance from the Government of the Federal Republic of Germany. The system has been implemented systematically by Siam Cement Co., Ltd. The Department of Vocational Education under the Ministry of Education is established Tha Luang Technical College to be a prototype college to experiment with vocational school-factory systems with the approval and technical assistance from the Federal Government of Germany.

Later, in the year 1989, the Ministry of Education has approved the trial of skilled technicians in major of Maintenance by German Technical Cooperation; Gesellschaft fur Technische Zusammenarbeit. The Federal Republic of Germany provided assistance in the formulation of training systems and practices. Therefore, in the next two years, 1991, there were three additional schools: the Technical College Minburi Samut Songkhram Technical College And Rayong Technical College.

In 1992, the name was changed to Dual Vocational Training (DVT). The graduates received a certificate of professional skills can work for the manufacturer. Most of them will earn a higher salary than the graduates of vocational certificate. However, if they were continually studying at the vocational certificate level (Diploma), they will have to complete the course at that time.

4.2.2 Dual Vocational System Project in 1995–1998 (Office of the Vocational Education Commission, 2014)

However, Dual Vocational Training (DVT) was developed in 1995. The Ministry of Education has adopted the curriculum vocational certificate (BE 2538). The Federal Government of Germany provided assistance, especially focused on public relations, understanding and developing for the teachers and entrepreneurs. However, this bilateral vocational education system had modified again when the 1999 National Education Act was enacted, particularly in Article 20, requires that vocational education and vocational training be regulated to be organized in government educational institutions. The private school or the cooperation between government and private was in accordance with the law on vocational education and related laws. It led to the reform of vocational education in the bilateral system in 2002.

4.2.3 Educational Reform: Dual Vocational Education System Reform in 2002–2007 (Office of the Vocational Education Commission, 2014)

According to the National Education Act BE 2542, it was the education reform at that time, particularly in organization, management, instructor, teachers, curriculum and Learning Reform. Meanwhile, the Department of Vocational Education, there has been a change in the management of vocational education in the bilateral system by the following.

1. Reform of the curriculum in the academic year 2002, the Ministry of Education promulgated the Diploma of Vocational Education Program BE 2545 and in the academic year 2003. The curriculum BE 2545 (2003) was promulgated and the curriculum was introduced. It has changed the apprentice period. The essence of dual education system is as follows:

1.1 Course Principles: This new curriculum was a course that focused on specific areas of expertise, giving the opportunity to choose from a variety of methods and can choose the learning method based on the potential and opportunity of the learner. Furthermore, it can transfer, accumulative credit. The important thing was a program that promotes collaborative and co-ordination in education between government agencies and private organizations.

1.2 On how to manage teaching: From the point of view of vocational education reform, the philosophy was that graduates must be knowledgeable and understanding life. For the curriculum reform and teaching instruction was specific in 4 real actions: (1) Learn from real practitioners (2) Learn in real workplaces (3) Learn in real culture (4) Learn in manufacturing. The new curriculum is focused on learning with manufacturer and practicality. The reason was to be a professional and focused on the job training systems. It is provided in 2 models

1) Traineeships are offered to vocational schools in the field of vocational education for at least one semester.

2) Dual Education or half internship: This new curriculum has allowed the education institution to introduce courses in manufacturing to be training at least three semesters in the vocational and two semesters in diploma level.

4.2.4 Dual Education System in 2008–Present (Office of the Vocational Education Commission, 2014)

Section 8 of Vocational Education Act B.E. 2551 enacted that vocational education management and professional training shall be organized in three forms: (The Government Gazette, 2014)

1. Formal education is the education management focusing on education in the educational institutes mainly by defining the purposes, methods, curriculum, timeline for measurement and evaluation that are the conditions of a definite graduation.

2. Non-formal education is the education management with the flexibility in setting the goals, methods, curriculum, timeline for measurement and evaluation as conditions for graduation. The contents and curriculum must be appropriate and consistent with the problem conditions and the individual needs of each group.

3. Dual education system is the management of professional education resulting from the agreements between educational institutes or institutes with the establishments, state enterprises, or government agencies in the curriculum arrangement, teaching, measurement and evaluation. The learners take some time in the vocational education institutes and practices in the workplaces, state enterprise, or government agencies.

For the benefits in the production and the development of manpower, the education can be managed in various ways. It is important to focus on bilateral educational system management mainly by developing the Vocational Certificate Program (Vocational Certificate) B.E.2556, Higher Vocational Certificate Program B.E.2557 (Higher Vocational Certificate), and the Bachelor Program in Technology or Operations.

On 5th November, 2012, the Office of Vocational Education Commission has established the bilateral vocational center as the internal agency to promote and support in bilateral vocational education linked for enforcing the government policy towards the supervised institutes as well as coordinating with the network partners in bilateral vocational education management by forming the vocational education sub-committee for bilateral cooperation and management of vocational education. From the previous operations, they are considered the successful level from the indicators of the number of bilateral learners and workplaces which have increased steadily.

4.2.5 Cooperative Education

Cooperative Education in Thailand began at Suranaree University of Technology by the development of cooperative education system in 1993 with the cooperation from business sector, industrial sector, and government sector. The curriculum was arranged to have the cooperative education semester in turn of normal semesters. The first generation of students worked in the cooperative education field in 1995. After that, it expanded to other universities and the development of

cooperative education in Thailand occurred. In the academic year of 2002, the Higher Education Commission started the development project of cooperative education in the higher education institutes in the form of pilot projects. The prototype was from Suranaree University of Technology. The undergraduate students were promoted to perform the operation for at least 1 semester starting in the bilateral system in the academic year of 2002. There are 17 higher education institutes, 257 workplaces, and 679 university students participating in the project and expanded to the 5th generation in the academic year of 2004. In total, 60 higher education institutes, 2,000 workplaces, and 10,444 university students participated. After that, the Higher Education Commission did not support in the budgets but the support was still in the policies continually (Higher Education Commission, 2007). The **results expected to gain from implementing the policies and strategies of cooperative education to the practices** consisting of the following 6 issues:

1. Quality of the graduates: For those who graduate with cooperative education, when entering the world of work, it will take less time in learning about the work, understand the system in the organization, and can adapt themselves faster to be advance in career and has the broader perspective on their career which will be very beneficial to students.

2. Quality of the higher education institutes: The cooperative education will be the important mechanism in the reform of higher education focusing on adjusting the roles of higher education institutes to turn to pay attention to the demands or the satisfaction of the organizations using the graduates. This can create the academic cooperation between the higher education institutes and the organizations using the graduates. There is the system of data transfer on the demands leading to the adjustment of curriculum adhering the learners mainly and the attempt to increase the competence in working of the graduates (Employability) with the higher income and to be satisfactory on the workplaces. Moreover, the cooperative education can also increase the experiences of the advisors who observe the works of the students in the organizations using the graduates. This will lead to the learning development in correspondence with the demands of the organizations using the graduates more and the academic cooperation between the higher education institutes and the organizations using the graduates.

3. Quality of the organizations using the graduates: The cooperative education partly helps reducing the production cost. It will not waste the time and budgets in developing the readiness of the new employees to be able to use the processes of cooperative education in recruiting the employees to reduce the risks in selecting the new employees who are inefficient. Moreover, it will be beneficial from the observation of the advisors, academic reports, the projects which the students of cooperative education have conducted to improve the working process or the production process leading to the higher gross domestic products. This can build the system in which the organizations using the graduates can participate in developing the graduate quality as well as being considered as the social responsibilities.

4. Building new knowledge: The cooperative education will help creating the new knowledge in the organization using the graduates including further to the advisor and commercial research.

5. The in-depth relationships between the demand and Higher Education Institutions: It will connect the business world and industry with other fields with the world of education together. The profound relationship of the two worlds has been developed by initiating the relationship of participation of the organization using the graduates since the preparation or improvement of the curriculum, development on mutual assistance into the Knowledge-based society and knowledge management, dependence of knowledge, information, information and technology, utilization of human resources, and the tools or technology of both parties which are so effective to adapt to the partnerships or stakeholders.

6. Building the capacity of the country: The cooperative education will enhance the competency of all relevant parties from the public sector, organizations using the graduate sector, and the semesters. It is to learn together to develop each other's knowledge. The cooperative education is important for educational investment efficiency and for economic and social security in order to enhance the ability of graduates to respond to the needs of the organization using the graduates. This can also build the confidence in high-volume manpower investment.

For the operation of cooperative education, there are currently cooperative education activities divided into 9 cooperative development regional networks, namely, Upper Northern Network, Lower Northern Network, Upper Northeastern

Network, Lower Northeastern Network, Upper Central Region Network, Lower Central Region Network, Eastern Network, Upper Southern Network, and Lower Southern Network. The Office of the Higher Education Commission encourages the agreements including the use of resources and knowledge shared between networks for the development of higher education or higher education institutes with the corporate sector and group of organizations using the graduates.

At present, there is the agreement at the levels of institutes, domestic and foreign networks such as Office of Higher Education Commission, Thai Cooperative Education Association, Federation of Thai Industries, Chamber of Commerce of Thailand, Thai Logistics Confederation, and Rector's Council of Thailand. Moreover, Office of the Higher Education Commission has also appointed the Sub-Committee on Cooperative Education Development Promotion in Higher Education Institutes. This was later changed to the Sub-Committee on Promotion and Development of Integrated Education and Work to develop cooperation plans for promoting cooperative education in higher education institutes. The results of operation in 2008–2012 showed that the number of participating institutes, number of students, and number of workplaces have increased in all categories. In 2012, there were 106 participating institutes, 30,592 students, and 13,294 workplaces.

On of the interesting results from cooperative education arrangement apart from the empowerment of potential and competences of the students which can make the graduates of cooperative education have the characteristics, competencies and skills responding to the needs of the labor market/organizations using the graduates is the cooperative education curriculum focusing on Learning Outcome Education conforming to Thailand Qualification Framework (TQF). The performance of the graduates of cooperative education program will elevate the quality of higher education institutes to be acceptable to the organizations using the graduates both regionally and internationally which is related to Thailand Qualification Framework.

4.2.6 Joint Public and Private Sector Committee on Workforce Production and Development Planning appointed by the Order of Ministry of Education No.64/2552 from 20th February, 2009 (Office of the Education Council, 2011), for the cooperation between the public and private sectors under the process

and forms of committee is for jointly study the demand and plan for the production and development of workforce to agree with the country's demands in order to be the mechanism in human quality development leading to the country development and enhancement of competitiveness with several countries having Minister of Education (Mr. Chaiwut Bannawat) to preside. The committees have the compositions from various organizations and experts as follows; Office of the Education Council, Chamber of Commerce of Thailand, Federation of Thai Industries, Thai Bankers' Association Thai Travel Association, Office of the National Economic and Social Development Board, Office of the Basic Education Commission, Office of the Higher Education Commission, Office of Vocational Education Commission, Teachers and Educational Personnel Council, Rector's Council of Thailand, Rector's Council of Rajabhat University, Rector's Council of Rajamangala University of Technology, Association of Private Higher Education Institutes of Thailand, Association of Private Vocational Colleges of Thailand, Association of Private Education Council of Thailand, Medical Council of Thailand, Lawyers Council, Nursing Council, Pharmacy Council, Dental Council, Architect Council of Thailand, Engineering Council, Federation of Accounting Professions, Council of Science and Technology Professionals, Franchise and Thai SMEs Business Association, Association of Thai Software Industry, Thai Logistics and Production Society, Thai Garment Manufacturers Association, Thai Gem and Jewelry Traders Association, Thai Journalists Association, Thai Broadcast Journalists Association, Thailand Development Research Institute (TDRI), Office of the Private Education Commission, and the experts from Chulalongkorn University, Thai Capital Market Research Resource and inspector of Ministry of Education. The committee has the powers and duties as follows:

1. Study the demands and plan for the production and development of workforce in accordance with the country's demands.
2. Promote and support the private sector to play a part and participate in production planning and workforce development.
3. Monitor the results of workforce production and development as well as solving related problems.
4. Appoint the Sub-Committee/Working Group to perform the operations as deemed appropriate

Operation of the committee

Strategies in the workforce production and development of the country during the educational reform in the second decade B.E.2552–2561

Visions

The system of workforce production and development of the country must be consistent with the needs and efficiency in sustainable development of the country to be competitive with other countries with the cooperation from all sectors.

Goals in 2018

1. There is National Qualification Framework (NQF) and the system of workforce production and development is improved according to National Qualification Framework.
2. Thailand Professional Qualification Institute is established to certify the knowledge and competences in the operation following the standards of professional qualifications framework.
3. Expand bilateral education, cooperative education, and internships more with the proportion of students in bilateral and cooperative education calculated as 30% of vocational and higher education students.
4. The proportion of vocational students increased with the proportion of vocational students: upper secondary education of 60:40.
5. Labor force with upper secondary education increases to 65 percent and has been professionally qualified by standards.
6. Labor productivity increases by 1% per year since 2011.

Operational framework

1. Determine the direction of workforce demand and create the cooperation system from all sectors whether the professional group, professional association, workplaces/using organizations, educational institutes, vocational training center/manufacturers.
2. Develop National Qualification Framework to certify academic knowledge and professional qualification of the graduates at all levels/all types of

education and professional qualifications along with establishing the organizations to certify the performance following the professional standards and professional development of teachers, executives and educational institutes.

3. Develop the preparation system for advising the education and career guidance to encourage learners to choose their study according to their aptitudes, interests, needs, labor markets, and country's development strategies

4. Develop the curriculum that focuses on practical training to learn in the career by expanding bilateral, cooperative education and vocational training as well as promoting working along with studying to promote lifelong learning.

The key strategies and responsible agencies are:

1st Strategy: Reforming education for profession: The key measures are Work Integrated Learning (WIL) including bilateral education, cooperative education, internship, curriculum improvement, teaching and learning methods to promote the career, elevate the language skills, use technology to support learning processes, etc.

The responsible agencies are Ministry of Education, Ministry of Labour, Ministry of Science and Technology, Ministry of industry, Federation of Thai Industries, Chamber of Commerce of Thailand, Public Relations Department.

2nd Strategy: Develop quality of workforce at all levels: There are important measures such as people development to have knowledge, skills, and quality to be the skill intensive, high-level workforce development for the research and development of new product innovations with the cooperation from the production sector and foreign countries, etc.

The responsible agencies are Ministry of Education, Ministry of Labour, Ministry of Science and Technology, Ministry of industry, National Research Council, Federation of Thai Industries, Chamber of Commerce of Thailand, and Public Relations Department.

3rd Strategy: Accelerate the production and development of vocational education: The important measures are such as adjusting educational paradigms, focusing on education for careers, promoting professional values along with promoting the creation of quality vocational labor to the production sector and industrial sector, developing the competency system, transferring based on knowledge and experience standards, organizing vocational education with emphasis on practices

more than theories, expanding the bilateral education system, promoting and supporting the development of modern laboratory and providing the system to share this facility among the institutes.

The responsible agencies are Ministry of Education, Ministry of Labour, Ministry of Science and Technology, Federation of Thai Industries, Chamber of Commerce of Thailand.

4th Strategy: Producing and developing the workforce in science and technology including the shortage fields necessary for national development.

5th Strategy: Develop capacity and capacity of workforce: The important measures are such as encouraging and promoting short-term training for workers or graduates to be profound in their knowledge by collaborating with public and private training institutes to organize training for those who have completed compulsory or upper secondary education to have vocational skills, develop the standardized system of professional standards and standards of workforce to be acceptable to all parties, develop the network of laboratories of agencies and organizations so that they can be shared effectively.

The responsible agencies are Ministry of Education, Ministry of Labour, Ministry of Science and Technology, Ministry of Industry, National Research Council, Federation of Thai Industries, Chamber of Commerce of Thailand, and Public Relations Department.

6th Strategy: Enhance the sustainability to the production and service sectors linked to human development: There are important measures such as creating mechanisms for research and transfer of knowledge and technology among the private sector, workplaces, with educational institutes and vocational education, etc.

The responsible agencies are Ministry of Education, Ministry of Science and Technology, Ministry of Labour, National Research Council, Federation of Thai Industries, Chamber of Commerce of Thailand.

7th Strategy: Strengthen the teachers and administrators: The important measures are such as teacher development and develop the institutes for research and development, create commercial productivity, strengthen technology enterprises in cooperation with the private sector and industrial sector, collaborate with Teacher Professional Organization to develop competencies and raise the quality standards of

teachers and administrators, improve the quality of teachers/trainers urgently to keep up with modern technology, consider setting professional standards in various areas with the private sector, etc.

The responsible agencies are Ministry of Education, Ministry of Labour, Federation of Thai Industries, Chamber of Commerce of Thailand.

8th Strategy: Develop the effective management system: The key measures include setting up the joint-committees for public and private sectors to plan for the production and workforce development, develop National Qualification Framework (NQF) including developing Thai Vocational Qualification (TVQ), establish the professional qualification institutes to be the mechanism and tools for workforce development to have knowledge and competence responding to the needs of the labor market, etc.

The responsible agencies are Ministry of Education, Ministry of Labour, Ministry of Science and Technology, Ministry of Industry, National Research Council, Federation of Thai Industries, Chamber of Commerce of Thailand, and Public Relations Department.

9th Strategy: Establish cooperation and network systems for the workforce production and development: There are important measures such as promoting the workplaces to participate in the workforce production and development, especially in the demanded fields with incentives for taxation, relaxation, regulations, and other supports, organize systematically-linked accessible databases in the demand of labor market, job positions, production potential of educational institute, and student/graduate information, develop the system to monitor the performance of agencies involving in the workforce production and development to complete in the same direction to strengthen multilateral and trilateral cooperation with countries in the ASEAN region or the European Union or the United States and other regions to develop human resource empowerment, establish the committees with representatives from various agencies to develop information systems of Data exchange via electronic systems or media concretely.

The responsible agencies are Ministry of Education, Ministry of Labour, Ministry of Science and Technology, Ministry of Industry, National Research Council, Federation of Thai Industries, Chamber of Commerce of Thailand, National Statistics Office, and Public Relations Department.

4.2.7 National Committee on Skill Development and Coordination of Occupational Training by virtue of the regulations of Office of the Prime Minister on Labor Development and National Vocational Training Coordination B.E.2552 (Government Gazette, 2009) requires one committee to set policies, guidelines, measures and coordination related to labor development and vocational training. The labor force development is in agreement with the government policies and National Economic and Social Development Plan as well as coordinating with human resource development plan between education system and labor development system to comply with government's policies consistently, systematically, and efficiently called "National Committee on Skill Development and Coordination of Occupational Training" consisting of Prime Minister or Deputy Prime Minister assigned by Prime Minister to be the President, Minister of Labor as the Vice President. The committees are Permanent Secretary of Tourism and Sports, Permanent Secretary of Social Development and Human Security, Permanent Secretary of Agriculture and Cooperatives, Permanent Secretary of Interior, Permanent Secretary of Justice, Permanent Secretary of Labor, Permanent Secretary of Science and Technology, Permanent Secretary of Education, Permanent Secretary of Industry, Secretariat of Vocational Education Commission, Secretariat of National Economic and Social Development Commission, Director of Bureau of the Budget, Director-General of Department of Employment, Director-General of Department of Labor Protection and Welfare, Secretariat of Board of Investment, Secretariat of Social Security Officer, Director of Office of Small and Medium Enterprise Promotion, Permanent Secretary of Bangkok, President of Personnel Management Association of Thailand, President of Federation of Thai Industries, representatives of Employer's Confederation of Thailand, and representatives of Employee's Confederation of Thailand for 2 persons each, not over 3 qualified committees, and Director-General of Department of Labor Development as the committee and secretary, and Deputy Director-General of Department of Labor Development assigned by Director-General of Department of Labor Development as the committee and assistant secretary.

Authorities and duties of committee

1. Define policies and guidelines for the development of labor and the coordination of occupational training of laborers in accordance with government policies and National Economic and Social Development Plan
2. Coordinate the human resource development plan between the education system and the labor force development system to be in accordance with government policies and National Economic and Social Development Plan
3. Coordinate the policies, skill development plan, and vocational training plans of all government agencies and private agencies for the unity in labor development to eliminate the redundancy and waste.
4. Monitor and evaluate the performance following the policies and plan in labor developing and coordinating the vocational training of relevant agencies.
5. Propose solutions to problems and obstacles related to the labor development and coordination of vocational training
6. Perform any other actions as assigned by the Cabinet or the Prime Minister.

Operation of the committee

1. Appoint the sub-committee/working group to perform the following operations:

(1) Subcommittee on Strategic Framework Development of Labor Force in Automotive and Auto Parts Industries (5th order of 5/2555 dated 23rd April, 2012)

- Strategies in the Workforce Development in the Automotive and Auto Parts Industry B.E.2556

(2) Sub-committee on the Data Analysis for Planning the National Workforce Development (order No. 2/2550 dated 8th November, 2007)

- Working Group on the Organization of Database for the Vocational Training in the Public and Private Agencies (order No. 1/2552 dated 24th August, 2009)

(3) Sub-committee on the Development of Labor Potential in Languages and Culture to Serve ASEAN Economic Community (order No. 2/2556 dated 29th November, 2013)

(4) Sub-committee on the Development of Provincial Labor and Coordination of Vocational Training (order No. /2555 dated 23rd August, 2012)

(5) Sub-committee on the Enforcement of Strategies of National Labor Development and Coordination of Vocational Training (order No. 1/2555 dated 23rd February, 2012)

(6) Sub-committee on the Improvement and Revision of Regulations of Office of the Prime Minister on Labor Development and National Vocational Training Coordination B.E.2552 (order No. 3/2555 dated 23rd April, 2012)

2. Propose for the establishment of Automotive Human Resource Development Academy (AHRDA). The academy occurs from the demand of industrial sector with the support from the Japanese government, Ministry of Industry, and cooperation with vocational education institutes and workplaces focusing on developing the personnel to be the trainers of Department of Skill Development and the trainers of the vocational education institutes in the skills related to the automotive and auto parts industry such as CMC welding, mechatronics. The vocational students can study the modern technologies and innovations in the automotive and auto parts industry set by the resolution of the Cabinet (3rd September, 2013). It was opened for the operation on 2nd September, 2015, under the recommendations of National Committee on Skill Development and Coordination of Occupational Training and the operation of the working group following the order of Department of Skill Development No.789/2556 on the appointment of working group on the establishment of Automotive Human Resource Development Academy dated 26th November, 2013.

4.2.8 Joint Public and Private Sector Committee on Development student in Vocational Education (Office of the Vocational Education Commission, 2015) appointed by the order of Ministry of Education No. 876/2556 dated 18th October, 2013, to be the joint-committees to operate in the workforce production and development, workforce demands, workforce plan both in the quantity and quality mutually between the public and private sectors to be the mechanism in managing the

vocational education under the cooperation with the private sector concretely. For appointing the Joint Public and Private Sector Committee on Development student in Vocational Education according to the order of Ministry of Education No. 876/2556 dated 18th October, 2013, having Minister of Education as the President and having the committees from the public and private sectors with the main roles on the workforce production and development for 23 persons in vocational education which are 1. President of Vocational Education Commission, 2. Secretary of Private Education Commission, 3. Secretary of Basic Education Commission, 4. Secretary of Non-formal and Informal Education, 5. Secretary of Education Council, 6. Secretary of National Economic and Social Development Board, 7. Permanent Secretary of Industry, 8. Permanent Secretary of Commerce, 9. Director-General of Department of Employment, 10. Director-General of Department of Skill Development, 11. Director-General of Department of Industry, 12. Director-General of Department of Agricultural Extension, 13. Director-General of Revenue Department, 14. Director of Thailand Professional Qualification Institute, 15. Secretary of Board of Investment Promotion, 16. Secretary of Thai Bankers Association, 17. Director of Small and Medium Enterprise Promotion, 18. President of Federation of Thai Industries, 19. President of Chamber of Commerce of Thailand, 20. President of Tourism Council of Thailand, 21. Governor of Industrial Estate Authority of Thailand, 22. Representative of Agricultural Group Organization, 23. Representative of local administration organizations, and additionally appointed for 2 persons namely 24. Permanent Secretary of Science and Technology, 25. Secretary of National Science Technology and Innovation Policy Office having the Secretary of Vocational Education Commission as the committee and secretary and having the Deputy Secretary of Vocational Education Commission as the committee and assistant secretary.

Authorities and duties of the committee

Joint Public and Private Sector Committee on Development student in Vocational Education has the authorities and duties in considering, proposing the approaches and measures in solving the problems and obstacles in the workforce production and development, workforce demands, workforce planning both in the quantity and quality, promote and support the participating vocational education in

various forms including the quality and standards of vocational education management, promotion, coordination in the project operation on the cooperation between the public and private sectors in publicizing the operations of Joint-Committees for the Public and Private Sector as well as the information on labor and the support of information and consultation to the operation and the appointment of other commissions as necessary.

Operations of the committee

Joint Public and Private Sector Committee on Development student in Vocational Education performs the operation together with the Joint Public and Private Sector Subcommittee on Development student in Vocational Education for promoting the operations of Joint Public and Private Sector Committee on Development student in Vocational Education appointed by Ministry of Education, order No. SorAorSor.37/2559 for 24 occupational groups, 3 regional groups, 5 regional chamber of commerce group, and 1 supporting group as follows:

1. Occupational Group of Information Technology, Communication, and Digital Content,
2. Occupational Group of Textile, Garments, and Fashion,
3. Mold Occupational Group,
4. Occupational Group of Agriculture and Agricultural Industry,
5. Occupational Group of Construction, Architecture, and Civil,
6. Occupational Group of Electrical and Electronic Industry,
7. Occupational Group of Merchant Marine,
8. Occupational Group of Logistics,
9. Occupational Group of Automotive Services,
10. Occupational Group of Hotels and Tourism,
11. Occupational Group of Jewelries and Ornaments,
12. Occupational Group of Energy,
13. Occupational Group of Retail,
14. Occupational Group of Small Engine,
15. Occupational Group of Business Sector and Food Services,
16. Occupational Group of Petroleum and Petrochemical,
17. Occupational Group of Automotive and Auto Parts,
18. Occupational Group of Plastic Industry,
19. Occupational Group of Model Industrial Estate,
20. Occupational Group of Air-conditioner and Refrigerator,
- 21 Occupational Group of Printing and Container,
22. Occupational Group of Machines, Metals, and Agricultural Machines,
23. Occupational Group of Body and Paint,
24. MICE Occupational Group,
25. Southern Group,
26. Northeastern Group,
27. Northern Group
28. Northern Chamber of Commerce Group,
29. Central Chamber of

Commerce Group, 30. Eastern Chamber of Commerce Group, 31. Northeastern Chamber of Commerce Group, 32. Southern Chamber of Commerce Group, 33. Research and Development Group.

The main operations in preparing the workforce and labor efficiency developing in the automotive and auto parts industry of Joint Public and Private Sector Committee on Development student in Vocational Education are as follows:

Pilot project in the dual education system in the field of auto parts production

Joint Public and Private Sector Subcommittee on Development student in Vocational Education; automotive and auto parts occupational group in cooperation with Department of Skill Development and the industrial sector create the bilateral education system in the higher vocational education in 15 technical colleges consisting of Chachoengsao Technical College, Chonburi Technical College, Rayong Technical College, Samut Prakan Technical College, Chulaphorn Technical College (Lat Khwang), Nakhon Nayok Technical College, Prachin Buri Technical College, Saraburi Technical College, Suphanburi Technical College, Ratchaburi Technical College, Nakhon Ratchasima Technical College, Buriram Technical College, Surin Technical College, Kamphaengphet Technical College, Sakon Nakhon Technical College (wait for confirmation) with the same standards and can be mutually used within the 15 Technical college as the pilot group by generating the curriculum to complete in 2015. The curriculum is open in 2016 in 4 pilot technical colleges (Nakhon Nayok Technical College, Chachoengsao Technical College, Chonburi Technical College, and Suphanburi Technical College). The total is 61 students and the curriculum is planned to be expand for using in the total of 15 colleges in 2018 with the total of 1,000 students in 2021. Such curriculum consists of 1 year study in the educational institute and 1 year of professional experience training in the workplace to provide students with higher skills and practical work in order to elevate the skills of students. The working group of automotive and auto parts industry in cooperation with Ministry of Labour arranged the project of short-term vocational skill training on the automotive and auto parts field with AHRDA for 120 hours. There are 15 operations receiving the vocational students to practice for working. The

training curriculum is available both in theories and practices for 5 curricula; 1. The application of NX cam for Milling Operation program, 2. Skills of industrial technician, 3. Basic electricity, 4. MAG welding for auto parts production, and 5. SQCD (Office of Vocational Education Commission, 2017).

In such form of cooperation, the private sector manages the policies, demands, and data on human resources. The government supplies equipment, budget, and trainers.

4.2.9 Public-private steering committee is established for the country enforcement following the order of Prime Minister (General Prayut Chan-ocha). The Cabinet had the resolution to acknowledge on 15th December, 2015, with the goal in being the country with high income together with the growth and participation in all sectors. This Committee will perform the operation in the form of public, private and civil state partnership (Pracharat) focusing on enforcing through the activities covering the 4 cores; 1) Good governance, 2) Innovation and productivity, 3) Development of human capital, and 4) Participation in the wealthiest. The Public-private steering committee, to enforce the country economy, 12 working groups are established to work with public – private – civil state (Pracharat) as follows:

Public – private – civil state (Pracharat) Working groups

1. Working group on the elevation of innovation and productivity
2. Working group on attracting the investment and developing the infrastructure of the country
3. Working group on the SMEs & Start-up promotion
4. Working group on the elevation of Competitive Workforce
5. Working group on the development of grassroots economy and civil state
6. Working group on the promotion of tourism and MICE
7. Working group on the promotion of export and investment abroad
8. Working group on the cluster development in the future industrial sector (New S-curve)

9. Working group on the revision and amendment of laws and public mechanism

10. Working group on the development of modern agriculture

11. Working group on the basic education and leadership development

12. Working group on generating the income and stimulating the expenditure of the country

The development of the cooperation between public and private sector in workforce preparation and labor development can be summarized in the form of cooperation as follows:

Table 4.4 Structure of public-private partnerships

Projects/Commissions	Main responsible agencies	Public parties	Private parties
Project of school – factory based education (Dual Education System) (B.E.2527–2537)	Office of Vocational Education Commission, Ministry of Education	Office of Vocational Education Commission	Workplace
Project of Dual Vocational System (B.E.2538–2541)	Office of Vocational Education Commission, Ministry of Education	Office of Vocational Education Commission	Workplace
Reform of Dual Vocational Education System (B.E.2545–2550)	Office of Vocational Education Commission, Ministry of Education	Office of Vocational Education Commission	Workplace
Dual Education System (B.E.2551–now)	Office of Vocational Education Commission, Ministry of Education	Office of Vocational Education Commission	Workplace
Cooperative Education	Office of Higher Education Commission	- Office of Higher Education Commission - Universities	Workplace

Table 4.4 Structure of public-private partnerships (cont.)

Projects/Commissions	Main responsible agencies	Public parties	Private parties
Joint Public and Private Sector Committee on Workforce Production and Development Planning	Ministry of Education	-Secretary of Education Council -Office of National Economics and Social Development Board	-Chamber of Commerce of Thailand -Federation of Thai Industries -Thai Bankers Association
		-Office of Basic Education -Office of Higher Education Commission - Office of Vocational Education Commission -Federation of Teachers and Educational Personnel -Council of University Presidents of Thailand - Council of Rajabhat University Presidents of Thailand -Council of Rajamangala	-Association of Thai Travel Agents -Franchise and Thai SMEs Business Association -Association of Thai Software Industry -Thai Logistics Confederation -Thai Garment Manufacturers Association -Thai Gem and Jewelry Traders Association -Thai Journalist Association -Thai Broadcast Journalist

Table 4.4 Structure of public-private partnerships (cont.)

Projects/Commissions	Main responsible agencies	Public parties	Private parties
Joint Public and Private Sector Committee on Workforce Production and Development Planning (continued)		University of Technology Presidents of Thailand -Association of Private Higher Education -Association of Private and Vocational Education Colleges of Thailand -Association of Private Education Council of Thailand -Medical Council of Thailand -Lawyers Council -Nursing Council -Pharmacy Council - Dental Council -Architect Council of Thailand -Engineering Council -Federation of Accounting	Association

Table 4.4 Structure of public-private partnerships (cont.)

Projects/Commissions	Main responsible agencies	Public parties	Private parties
Joint Public and Private Sector Committee on Workforce Production and Development Planning (continued)		Professions -Council of Science and Technology Professionals -Thailand Development Research Institute (TDRI) -Office of the Private Education Commission -Thai Capital Market Research Resource	
National Committee on Skill Development and Coordination of Occupational Training	Department of Skill Development, Ministry of Labour	-Ministry of Tourism and Sports -Ministry of Social Development and Human Security -Ministry of Agriculture and Cooperatives -Ministry of Interior	-Personnel Management Association of Thailand -Federation of Thai Industries -Employer's Confederation of Thailand -Employee's Confederation of Thailand

Table 4.4 Structure of public-private partnerships (cont.)

Projects/Commissions	Main responsible agencies	Public parties	Private parties
National Committee on Skill Development and Coordination of Occupational Training (continued)		- Ministry of Justice - Ministry of Labour - Ministry of Science and Technology - Ministry of Education - Ministry of Industry - Office of Vocational Education Commission - Office of National Economic and Social Development Board - Bureau of Budget - Department of Employment - Department of Welfare and Labor Protection - Office of Board of Investment - Office of Social Security - Office of Small and Medium Enterprise Promotion - Bangkok Administration	

Table 4.4 Structure of public-private partnerships (cont.)

Projects/Commissions	Main responsible agencies	Public parties	Private parties
Joint Public and Private Sector Committee on Development student in Vocational Education	Ministry of Education	- Ministry of Education - Office of Vocational Education Commission - Office of the Private Education Promotion Commission - Office of Basic Education Commission - Non-formal and Informal Education - Education Council - Office of National Economic and Social Development Board - Ministry of Industry - Ministry of Commerce	- Federation of Thai Industries - Chamber of Commerce of Thailand - Tourism Council of Thailand - Agricultural Group Organization - Thai Bankers Association

Table 4.4 Structure of public-private partnerships (cont.)

Projects/Commissions	Main responsible agencies	Public parties	Private parties
Joint Public and Private Sector Committee on Development student in Vocational Education (continued)		- Department of Employment - Department of Skill Development - Department of Industrial Works - Department of Agricultural Extension - Revenue Department - Professional Qualifications Institute - Office of Board of Investment - Office of Small and Medium Enterprise Promotion - Industrial Estate Authority of Thailand - Local Administrative Organization	

Table 4.4 Structure of public-private partnerships (cont.)

Projects/Commissions	Main responsible agencies	Public parties	Private parties
Public-private steering committee; Public-Private-Civil State (Pracharat) Working Groups	-	- Ministry of Science and Technology - National Science Technology and Innovation Policy Office	
		- Ministry of Science and Technology - Ministry of Finance - Ministry of Commerce - Ministry of Education - Ministry of Interior - Ministry of Tourism and Sports - Ministry of Industry - Ministry of Agriculture and Cooperatives	- Workplace - Civil state sector

Table 4.5 Summary of the period in the development of education and training management

National Economic and Social Development Plans	Development of motorcycle industry	Ministry of Education			Ministry of Labour		Ministry of Industry			Joint-Committee /Cooperation between the public and private sectors		
		Major events	Vocational Education	Higher Education	Regulations, plans, policies	Joint-Committee	Regulations, plans, policies	Joint-Committee	Projects/Activities		Regulations, plans, policies	Joint-Committee
Volume 4 (B.E.2520-2524)	2520	1 st period, import of parts for assembly (B.E.2520)	National Education Plan (B.E.2520-2524)									Joint Public and Private Sector Consultative Committee and Private Sectors to solve the economic problems in the period of General Prem Tinasulanon's Government
	2521	2 nd period, start to produce parts in Thailand (B.E.2521-2530)										
	2522											
	2523											
	2524											

Table 4.5 Summary of the period in the development of education and training management (cont.)

National Economic and Social Development Plans	Development of motorcycle industry	Major events	Ministry of Education			Ministry of Labour			Ministry of Industry			Joint-Committee /Cooperation between the public and private sectors
			Vocational Education	Higher Education	Regulations, plans, policies	Joint- Committee	Regulations, plans, policies	Joint- Committee	Projects/ Activities	Regulations, plans, policies	Joint- Committee	
2525												
2526												
2527		Project of school – factory based education (Dual Education System) (B.E.2527-2537)										
2528												
2529												
2530												
2531	3 rd period, producing the important in the industry with the high rate of continual expansion (B.E.2531-2540)											
2532												
2533												
2534												

Volume 5 (B.E.2525-2529)

Volume 6 (B.E.2530-2534)

Table 4.5 Summary of the period in the development of education and training management (cont.)

National Economic Development Plans	Development of motorcycle industry	Major events	Ministry of Education			Ministry of Labour			Ministry of Industry			Joint-Committee /Cooperation between the public and private sectors
			Vocational Education	Higher Education	Regulations, plans, policies	Joint- Committee	Regulations, plans, policies	Joint- Committee	Projects/ Activities	Regulations, plans, policies	Joint- Committee	
2535												
2536				Developed Cooperative education								
2537												
2538			Project of Dual Vocational System (B.E.2538- 2541)									
2539												
2540												
2541	4 th period, Expansion of cooperation to the manufacturers of parts (B.E.2541- 2544)											
2542				Office of Educational Reform B.E.2542	National Education Act B.E.2542							
2543												
2544												

Volume 7 (B.E.2535-2539)

Volume 8 (B.E. 2540-2544)

Table 4.5 Summary of the period in the development of education and training management (cont.)

National Economic and Social Development Plans	Development of motorcycle industry	Major events	Ministry of Education			Ministry of Labour			Ministry of Industry			Joint-Committee /Cooperation between the public and private sectors
			Vocational Education	Higher Education	Regulations, plans, policies	Joint-Committee	Regulations, plans, policies	Joint-Committee	Projects/Activities	Regulations, plans, policies	Joint-Committee	
2545	5 th period, export, research and development (R&D) to be the production base in the region (B.E.2545-now)	Detroit of Asia vision	Reform of Dual Vocational Education System (B.E.2545-2550)	Cooperative education pilot project (budget support until 2004)	National Education Act B.E.2542 (Volume 2 B.E.2545) - National Education Plan (B.E.2545-2559)					Automotive Industry Master Plan B.E. 2545-2549 by Automotive Institute		
2546												
2547		Detroit of Asia Project (B.E.2547-2553)							Preparation of engineering for automotive industry cluster of Detroit of Asia Project (B.E.2547-2548)			
2548												
2549		Coup d'etat			Notification of Ministry of Education on the standards of higher education							

Table 4.5 Summary of the period in the development of education and training management (cont.)

National Economic and Social Development Plans	Development of motorcycle industry	Major events	Ministry of Education			Ministry of Labour			Ministry of Industry			Joint-Committee between the public and private sectors
			Vocational Education	Higher Education	Regulations, plans, policies	Joint-Committee	Regulations, plans, policies	Joint-Committee	Projects/Activities	Regulations, plans, policies	Joint-Committee	
2550		Constitution 2007								Automotive Industry Master Plan B.E.2550-2554		
2551			Dual Education System (B.E.2551 - now)		Vocational Education Act B.E.2551							
2552				- Notification of Ministry of Education on the national standard framework of higher education qualifications B.E.2552 - National Education Plan, revised (B.E.2552-2559)		Joint Public and Private Sector Committee on Workforce Production and Development Planning						- National Committee on Skill Development and Coordination of Occupational Training B.E.2552
2553					National Education Act B.E.2542 (Volume 3 B.E.2553)							
2554		Establishment of Professional Qualifications Institute (Public Organization)										

Table 4.5 Summary of the period in the development of education and training management (cont.)

National Economic and Social Development Plans	Development of motorcycle industry	Major events	Ministry of Education			Ministry of Labour			Ministry of Industry			Joint-Committee /Cooperation between the public and private sectors
			Vocational Education	Higher Education	Regulations, plans, policies	Joint-Committee	Regulations, plans, policies	Joint-Committee	Projects/Activities	Regulations, plans, policies	Joint-Committee	
2555							Labor Master Plan B.E.2555-2559		- Automotive Industry Master Plan B.E.2555-2559 - Industry Development Master Plan B.E.2555-2574			
2556					Notification of Ministry of Education on the national standard framework of Vocational education qualifications B.E. 2556	Joint Public and Private Sector Committee on Development student in Vocational Education						
2557		Agenda of labor reform and education management										
2558	The government studied and planned to enforce the production of electric automobile	Enter AEC						Establishment of Automotive Human Resource Development Academy (AHRDA)				Public-private steering committee
2559												

Table 4.5 Summary of the period in the development of education and training management (cont.)

National Economic and Social Development Plans	Development of motorcycle industry	Major events	Ministry of Education			Ministry of Labour		Ministry of Industry			Joint-Committee /Cooperation between the public and private sectors	
			Vocational Education	Higher education	Regulations, plans, policies	Joint- Committee	Regulations, plans, policies	Joint- Committee	Projects/ Activities	Regulations, plans, policies		Joint- Committee
2560		Constitution B.E.2560, EEC			National Education Plan B.E.2560-2579		-Labor Master Plan B.E.2560- 2564 -Strategic Framework in the country's human resource development in the period of 20 years (B.E.2560- 2579)					
Volume 12 (B.E.2560-2564)												
2561												
2562												
2563												
2564												

From the study of development on the education to prepare the workforce and the development of labor efficiency of public and private sectors as well as cooperation between the public and private sectors, the workforce preparation and labor market development have been developed both operated by relevant public agencies and in the form of bilateral cooperation, trilateral, multilateral or intergovernmental committees between public agencies or between public and private sectors. It is still in the way of non-cooperation, lacking of continuity in the policies and implementation of plans and policies into effective practices. This results in the change to the working group or Joint Committee or project activities as defined in the plan which is possibly discussed in details as follows:

1. Form, structure, roles, and duties of the Committee

The forms and structure of committees involving in workforce preparation and labor efficiency development are mostly established by: 1) Cabinet resolution; 2) from the plans/policies of the government agencies, and 3) from the provisions of laws. However, each committee containing the parties comprising the public sector in the same agency, other relevant government sectors, and private sector which are organizations/associations, or on behalf of the individual in case of being appointed as the qualified person. In being the committees, they are mostly the committees in the positions when they are from the same department. This causes the duplicate work in different committee names. Moreover, as the main responsible agencies are different, it results in having many committees which cannot be known whether they still have period in duties or not as well as the roles that each committee conducts as the meetings are mostly on the defined agenda. The 1st interviewee (interview, 23rd February, 2017) views, “The founding committee is unable to meet the objectives and cannot create the link to the successful targets together because the structure and roles of each government agency are overlapped to each other and they also have the goals of their agencies.” This agrees with the 2nd interviewee, 3rd interviewee, 20th interviewee, and 25th interviewee (view the Appendix A page 298,307,310). Moreover, each committee has appointed subcommittees to work in the subgroup such as the appointment of the Joint-Committee of Public and Private Sector for the Vocational Workforce Development (CCER) by Ministry of Education in 2013 to implement the

workforce production and development, workforce demands, workforce planning both quantitatively and qualitatively between public and private sectors to be the mechanism for vocational management under concrete cooperation with the private sector for the appointment of Joint-Committee of Public and Private Sector for the Vocational Workforce Development. Meanwhile in the following year of 2014, the Office of the Vocational Education Commission, in collaboration with Department of Skill Development integrated teaching and learning systems in academic institutes under the Office of Vocational Education Commission, training, and testing in the skill development system seriously by forming the "Committee for the Integration of Skill Development for Vocational Students to Enter the Labor Market" aiming for the graduates and those who have not graduated or passed professional training to be able to test and get skilled labor standard accreditation conveniently. This is in line with the vocational education management focusing on the integration of learning and working as well as cooperating in arranging the education to grant the working people a chance to study in the vocational education level conveniently such as generating the special curriculum, transfer of knowledge and experiences including other operations beneficial for the development of vocational education and labor skill elevation and the increase of productivity for the benefits in the economic and social development of the country responding to national strategies in labor development and vocational training coordination defined by National Labor Development and Vocational Training Coordination Commission. This focuses on building the linkage between the human resource development in the study and working sectors to promote the occurrence of complete human resource development system. Later in 2016, Ministry of Education appointed the Joint-Committee of Public and Private Sector for Vocational Workforce Development to promote the operation by dividing into the occupational groups.

The point which should be considered is the redundancy of the Committee when the authority is sorted to supervise and direct. The fact that having many small joint committees results in inconsistent implementation. Or, on the other hand, this may be because of the fact that the first established joint-committee has not yet concretely or fully implemented.

2. Relationship between the public agencies and between the public sector and private sector

Regarding the relationship between the public agencies, as the public agencies are large and strict in the duties and supervision as well as the rights and duties as prescribed by law, any operation can be performed in delay as it requires passing the operational processes following the government's regulations. In case of different supervisions, it will result in the command as well. The 8th interviewee (Interview, 24th February, 2017) viewed, "The structure of the work of government agencies is not accurate. It has overlapping structure and responsibilities. There is the inconsistency and delay in the management on the regulation, budget, human resources or procurement." Moreover, there is also the lack of coordination and linkage in the policies and lack of major responsible agency. This is consistent with the comments of the 1st interview, 3rd interview, 4th interview, 7th interview, 10th interview, 11th interview, 12th interview, 13th interview, 18th interview, and 19th interview (view the Appendix A page 296,298,299,302,303,304,307).

However, the public agencies tend to work together in more integrated manner with the efforts in amending the rules and regulations to facilitate greater cooperation which requires time to complete the operation.

While the relationship between the public and the private sectors is in the friendly way and the involvement of the private sector at earlier stage is to support the budget and equipment/location mainly. Then, there is the development of participation by playing a role in the planning process. However, that the private sector participates, it is often the participation in the name of the organization/professional council having the same leaders mostly. This causes the non-clarity whether other private sector can participate in the industry or not.

Regarding the relationship between the public and the private sector, most studies have found that both sectors lack of mutual recognition and trust due to the confidentiality of the manufacturing process and the business competitiveness of the private sector as well as the bureaucratic attitude which is familiar with the command. The result is that today's collaboration is not yet able to address the real needs of the public and private sector. This is reflected from the comments of the 1st interviewee (Interview, 23rd February, 2017), "The private sector must be sincere to tell the real

needs to the public what are needed to be done so that the public sector is able to operate efficiently." This is in agreement with the 2nd interviewee, 8th interview, 12th interview, 13th interview, 14th interview, 16th interview, 18th interview, 19th interview, 20th interview, 21st interview, 22nd interview, 23rd interview, 24th interview, 25th interview, and 26th interview (view the Appendix A page 298, 301, 302, 304, 305, 307, 308, 309, 310).

Another problem found in the study on the relationship between public agencies is the lack of the same database or the same information but not the same storage. Each agency stores the information differently. It lacks of integration and there is the duplication. The 1st interviewee (Interview, 23rd February, 2017) views, "The public agencies are not able to work together effectively. There is no same database, lack of coordination of information that must be reported to relevant agencies." This system of the same database is in agreement with the 5th interview, 16th interview, 19th interview, 20th interview, 23rd interview, and 26th interview view the Appendix A page 297, 304, 307, 310). For eliminating such occurring problem, Ministry of Industry by Office of Industrial Economics initiates to create the Labor and Economic Data Exchange or LED-X in cooperation with Ministry of Labour (by Office of Permanent Secretary of Labor). They are the first two agencies with the cooperation in having the same database. Such LED-X system occurs from the study project to arrange the workforce management to serve the workforce planning in the industry of the country in mid-2008. At that time, there was the problem of labor shortage in several main industries with the main reason of the incompleteness of the labor information. It is caused by different storing agencies, redundant work, and out-of-date data resulting in the difficulty in the workforce development and the imbalance between the demand and supply. The complete LED-X was expected to be really used in October, 2009, using the website <http://ledx.oie.go.th> (Office of Industrial Economics, 2009) and it was the system providing the services of industrial workforce as Real Time having the joint-committee between Office of Industrial Economics and Ministry of Labour responsible in supplying the information and news into the system and bringing the information obtained from the system to be analyzed or create the new products including warning the operators in the industrial and labor

sectors for benefiting the information mutually and worthily to reduce the redundant missions of tasks.

However, such system development has been divided into 3 phases; project to conduct demand and supply of workforce database to serve the planning of industrial sector development phase 1 in the fiscal year of 2009, project to conduct demand and supply of workforce database to serve the planning of industrial sector development phase 2 in the fiscal year of 2010, and project to conduct demand and supply of workforce database to serve the planning of industrial sector development phase 3 in the fiscal year of 2011 (Office of Industrial Economics, 2011). From the earlier phase as the appointment of joint-committee between 2 ministries, it can develop the network linking system to exchange the data from the database relevant to the economics and industry on the PMANP system of Ministry of Labour in the automatic form and the experiment in using the data from LED-X system to be used in responding to the economic situations and labor in the whole picture at the level of main industrial groups such as Automotive Industry Group and Textile Industry Group towards the operation in phase 2 to increase the linkage and exchange of data directly to the agencies owning the data such as in the supply following the educational level from Ministry of Education (under MOU). This includes the linkage and exchange of data with the agencies inside Ministry of Industry. In phase 3 which is the phase of increasing each field of industry to cover more as well as evaluating the operation in phase 1 and phase 2. The system is examined and modified in the form of Web service. After Ministry of Education having been able to develop the automatic system to serve fully, the LED-X system is changed to LEED-X+ (Labor Economic and Education Data Exchange Plus). In 2011, Office of Industrial Economics which is the main operator integrated 5 agencies in expanding the network to create the database in the form of MOU mutually namely Ministry of Industry, Ministry of Labour, Ministry of Education, National Statistical Office, and Federation of Thai Industries (Ministry of Labour, 2011) having the database in the other industrial groups more into 9 industrial groups. However, in 2011, there was the problem in budgets, lack of technicians, lack of data update, including the attack of hackers (Thai Publica, 2015) causing the website to close in late 2013 (Econnews, 2015). Until 2015, the 5 agencies which were the parties applied the system to be

modernized by increasing the industrial groups into 13 industrial groups in electricity and electronics, textiles and garment, automotive and parts, food and beverage, rubber, wood and furniture, leather, ceramics, plastic, chemicals, petrochemicals, paper and jewelry. In the future, it is likely to expand more by simplifying the data to be easy to understand in the form of image data or infographic. The new system seeks to solve the problem of data coming from many complicated sources and non-correspondent.

In addition, the cause of obstacle in the operation is due to the annual nature of the project. Although the working group has the opinion that it can be continually operated, it also depends on the policy of the executives which will mainly approve the budget. When lacking of budget, the project must be ceased and the website will be closed as there is no data update. From the system development again in 2015 until now, LEED-X system uses the name of <http://leedx.in.th/leedx/public> having the data of Key Indicator for each remarkable topic in each month. The presentation of Infographic has the tools in selecting to view the data series variously both in tables and graphs, etc. However, from studying such website, it is found that the recent data in the entire picture was in 2015–2016. Most data relevant to the industry will be presented by IIU or Industrial Intelligence Unit of Office of Industrial Economics, Ministry of Industry (<http://iiu.oie.go.th/Automotive/>). The data related to industrial factories will be presented in the LEED-X database such as searching for the industrial factories (<http://leedx.in.th/leedx/public/factory/list/0>). The summary of number of factories is divided following the features (<http://leedx.in.th/leedx/public/factory/summary?vPage=atb&vId=0>) and the summary of number of factories is divided into size ([http://leedx.in.th/leedx/public/factory/summary?vPage=size & vId=0](http://leedx.in.th/leedx/public/factory/summary?vPage=size&vId=0)) or the data of industrial situations such as automotive industry situation (<http://leedx.in.th/leedx/public/industrydata/1>). Moreover, it uses the system of data linkage to the database of relevant agencies such as the data of labor warning which will be connected to the website of Section of labor economics, Office of Permanent Secretary of Labor (<http://warning.mol.go.th/>). The data of labor demand will be connected to the website of Federation of Thai Industries such as labor demand (http://www.ftijob.com/data_job/position.aspx?basicDataType=overview&dataGroup=7)

Another problem from the operation is the cooperation under the MOU framework, the different definitions, the different group classification, or the

contributor who has raw data (Thai Publica, 2015) affecting statistical data on labor force in both quantity and quality. The mismatched statistical number causes different agencies to forecast, analyze, and map them into their own policies. The consequence is that there is no direction in the same way in labor development resulting in labor productivity and industry development.

Apart from the problem of coordination between government agencies, the relationship between public sector and private agencies is not smooth as well. This is reflected through the problem of data storage from industrial sector which is lack of cooperation from the employers in the operating places on the data support.

3. Policy makers, policy followers, and policy implementers

The discontinuity is one of the important problems of the policy makers that affect the policy followers and the policy implementers. The change in policy makers especially the government, leaders of various ministries, and policy followers as well as leaders or coordinators in the private sector who are possibly changed frequently with political agenda or position transfer will affect the continuity of the policy. The 2nd interviewee (Interview, 23rd February, 2017) views, “It is lack of the continuity of the policy due to the change in the administrator or policy maker”. This is in agreement with the comments of the 4th interviewee, 7th interviewee, 8th interviewee, 9th interviewee, 12th interviewee, 13th interviewee, 16th interviewee, and 18th interviewee (See Appendix A page 299, 300, 302, 303, 304, 306) causing at present the evaluation of some policies is unclear whether it is still used or not, for example, the case of LEED-X labor database which is lack of continuity in the implementation.

Another case illustrating the importance of policy making, policy compliance, and policy implementing is the coordination following National Qualification Framework such as the labor skill standard development of the Department of Skill Development, and professional qualifications framework, professional qualifications system of Professional Qualifications Institute (Public Organization) to link with Thai Qualifications Framework (TQF) of the Office of the Higher Education Commission or standard framework of higher education qualifications of the country, etc. It is still lack of concrete linkage and implementation policies. As a result, the workforce preparation and labor productivity development is delayed especially when the policy of promoting professional qualifications has been

established since the education reform policy under the National Education Act B.E.2542 and the establishment of the institute which was completed in 2011.

4. Laws, rules, and regulations

According to Table 4.4, it is found that the development of policies is in the form of rules, regulation, and plans. This is an important aspect of the government. If there are no laws, rules and regulations, then no action can be taken. The enforcement of each law, rule and regulation to exist and be enforced takes a long period of time. This has resulted in the inevitable demand for development or enforcement, especially in the rapidly changing automotive industry including the cases of complexity and difficulty of rules and regulations causing the operation of public sector and between public and private sectors to be difficult. The 21st interviewee (Interview, 8th March, 2017) views, “The legal limitations associated with the ministry are important factors in the coordination of government agencies resulting in the delayed policy and not to be able to meet the needs of the rapidly growing private sector.” This is in agreement with the comments of the 1st interviewee, 6th interviewee, 12th interviewee, 15th interviewee, 16th interviewee, 19th interviewee, 22nd interviewee, 24th interviewee, and 26th interviewee (See Appendix A page 297, 300, 302, 304, 307, 309, 310).

In addition, different types of law enforcement have resulted in overlapping committees as in the case of the National Labor Development and Vocational Training Coordination Commission established by the regulation of Office of the Prime Minister on National Workforce Development and Vocational Training Coordination B.E.2552 which defines policies, guidelines, measures and coordination related to labor force development and vocational training of those who are in the labor force, This is in line with government policies and National Economic and Social Development Plan as well as coordinating with human resource development plans between education system and labor development system to comply with the government’s policies consistently, systematically, and efficiently. This is cooperated by Labor Skill Development Promotion Commission established by the Labor Skill Development Promotion Act B.E.2545 and the Labor Skill Development Promotion Act (Volume 2) B.E.2557 having similar commission structure and the duties performance is redundant in some issues.

5. Education curriculum

The education curriculum has evolved from the policy study following the plan and policy which is quite well. However, the problem of the education curriculum is the issue of implementation to produce the labor to meet the needs of the industry most. In addition, from the development of the curriculum, it is found that there is the shift in the curriculum for labor development among the public agencies which do not play a major role in workforce preparation and labor development. This is reflects from the lack of policy integration and collaboration. The 1st interviewee (Interview, 23rd February, 2017) views, “Ministry of Education and Ministry of Labour lack of the link in the curriculum to prepare people in learning age and working age which must be consistent with the development of efficiency and quality both before and after entering the industrial sector.” This is in agreement with the comments of the 7th interviewee, 18th interviewee, and 19th interviewee (See Appendix A page 300, 306, 307). Moreover, it may be caused by giving the policy inaccurately to the real main responsible person. In addition, that the curriculum makers are lack of the knowledge and understanding in industrial technology and putting the emphasis on theories than the real practices. This will result in the labor skill which cannot respond to the demand of private sector using the labor. It may be seen that the curriculum is not in agreement with the demands of the industrial sector. The 26th interviewee (Interview, 14th March, 2017) views, “The curriculum of the government agencies is not prepared to accommodate changes in the technological advancement. There are still some practical approaches in learning and teaching as the same.” And “The curriculum development remains lacking of understanding of the motorcycle industry clearly. The curriculum is still half-course prepared that do not focus on one of the clear techniques. It cannot demonstrate student competence whether the graduate students can work. However, it is to study for furthering at a higher level without focusing on specialized teaching.” This is in agreement with the comments of the 3rd interviewee, 4th interviewee, 5th interviewee, 6th interviewee, 8th interviewee, 9th interviewee, 11th interviewee, 12th interviewee, 16th interviewee, 17th interviewee, 20th interviewee, 21st interviewee, 22nd interviewee, and 23rd interviewee (See Appendix A page 298, 299, 300, 301, 302, 304, 305, 307, 308, 309, 310).

4.3 The Situation and Problems of Manpower Preparation and Labor Force Development in Thailand's Motorcycle Manufacturing Industry

Based on a study of educational and curriculum policy development to improve knowledge and skills of manpower before entering to the industry, developing the manpower preparation and developing of the cooperation between government and private sector in various pattern to prepare manpower and improve labor productivity, including development of dual education in vocational education has started from the 1984 until now. There were the cooperation between government and private sector to develop the labor skill such as the Cooperative Education in Higher Education Commission, the cooperative of the Office of the Vocational Education Commission, Public-Private Steering Committee and etc. The result of this study found that the development and implementation were based on the relevant conditions and problems by the following;

1. Policy formulation

The current cooperation situation shows that the formulation of policy on cooperation and related policies remains a concrete and ongoing problem. This was a problem due to the lack of planning or direction of the country to accommodate the direction of the industrial sector, especially the government announces the policy to target the country “Detroit of Asia”. It was a turning point in labor development, which has resulted in a system of inadequate education, knowledge and labor productivity to catch up the industrial development. It has by the following main causes;

(1) The country has no clear industrial stance, lack of understanding on the basis of local industrial, just focus only on the investment of foreign investors. As a result, the country was becoming a rapidly industrialized without the expert and labor skill.

(2) Policy formulation was discontinued and clarity as policy-makers changed according to each government, where the change of senior government executives directly impacts policy continuity and policy stance. It also affected the confidence of the private sector such as the importation or promotion of electric vehicle

technology or hybrid vehicle. All of this the private sector must be taken to prepare the technology to support it. Therefore, the policy was unclear, as well as using the budget for investment, it was relatively difficult to operate and impact on business competitiveness of the private sector. Meanwhile, education policy, especially the Ministry of Education, was responsible for direct manpower preparation, it was unclear and definite. This result was in the ineffectiveness of the collaboration in curriculum development to keep up with changes in the technology of motorcycle technology. The roles and responsibilities of government agencies were only responsible for labor Standard but it cannot accommodate the true capabilities of the workforce.

(3) Industrial policy-making has conflicting interests with private sector operator

(4) The government did not have the investment incentives to encourage on the strengths of automotive innovation. There was no private promotion for Thai people, academics or experts to operate independently. It was mainly dependent on foreign innovation. As a result, the country cannot afford to own its industry. The consequence, it was impossible to define a unified education curriculum or focus on Thai innovation.

(5) Defining the Road Map of the Country in Education Industry and the labor side was not consistent with the Human Resources in the country, it means the government was lack of data center of the personnel labor force, particularly collaboration and sharing of information in a tangible way and absence of using the same database such as the human resources data of the Ministry of Education or the Ministry of Labour, make it difficult to assess the situation of students' abilities and labor. It was not possible to analyze or evaluate the performance evaluation process or the ability to assess the basic skills of the personnel (youth, students) in comparison with developed countries, both agricultural and service industries. Therefore, the policy makers cannot set a Road Map of the manpower preparation if the situation was unclear and in accordance with industry needed. It was difficult to establish the foundations of the national education system. The government cannot achieve its goal of efficiently and adequately supporting the private sector. It has been done only planning to solve the current problem and needs of the government policy. It was evident that the country's personnel were not able to lead the way in innovation.

2. The values of education and culture of the Thai people

Thailand was still an agricultural country where is the most of the population seized agriculture. The promotion of the government sector to become an industrialized country will make it difficult to change the lifestyle of Thai people at that moment. In addition, the culture of the Thai people is focused on living comfortably. There was no intention of self-innovation and not ready for self-improvement. While, the values of Thai education is focused on general and continuing education until the bachelor's degree, because of the belief that working in an industrial facility was more difficult and progressive than working in the finance, banking, service and high reputation in society. Therefore, the government will affect the development of the curriculum to support the industry. As a result, the efficiency of the study cannot be effective.

3. Model and government agencies' structure and committees

Even though many joint committees were established, they did not achieve their addressed goals. Due to the co-management model and the structure of committee that is related to the positions of the government in both the role of the policy maker, the direction and the implementation of the policy, as a result, when a leader of a government agency is replaced by a position Coordination between government and private sectors has been discontinuous. In particular, the process will entitle the private sector to take part in the various aspects of the public sector. It also happens in private sector and cannot effectively expand into the region. Here was a summary of the format and structure of the committee as follows;

(1) Private individuals and committees were still lacking in public information and the private sector needs to provide real needs information to the public sector, including the business competition of each private sectors. This was the factors that the government cannot be supported to the private sectors needed. As a result, the cooperation between government and private sector have failed to achieve the will to improve labor productivity today.

(2) The government structure was complex and very large. There are overlapping of the job function and conflicts within internal of ministry, policymaking or directing was difficult. It may take time to improve jobs or to deliver new policies.

It also affected in effective coordination of the internal government that will be responsible for the main functions or a secondary role in developing talents and knowledge for the Thai people in the country.

4. The cooperation and jointly management between government and private sector

The cooperation between government and private sector has found that

(1) The private sector was an opinion that the government was not serious about investing and supporting innovation according to inexpert of automotive knowledge to develop truly innovative in automotive industry. Furthermore, the government was still relied the foreign technology and delay development of education systems. Therefore, it will affect to the country lacked of talented people and know-how. And the key factor was that government employment cannot attract talented people to work for the country.

(2) The barriers to communication between government and private sectors were not continuous and cannot take the policy seriously. This was a result of changing top management positions of the government or direct government policies.

(3) However, one model of cooperation that the private sector found as a good system was the bilateral education system but it was not achieved to the government target. The reason was that the cooperation between of both sides was not quite good at this moment, particularly without the idea from the private sector. In addition, the study found that there was a problem of government executives who is lacked of trust in the planning or direction of private education programs, including the private sector has the obstacles to make the training schedule available to learners by changing their work position to the prescribed course. This may affected to the production as well as the ability of the private sector to accommodate the total number of students. It was still the main factor that the implementation of the cooperation was not truly achieved.

(4) The cooperative between the government and private sector were still lacking. Although several committees were set up, they were unsuccessful in their goals. The key point was that the Government policy makers were unable to coordinate their cooperation with the private sector. Even the government was several establishment of a working group, it is impossible to find the best solution in the past.

(5) Both sectors are focused on improving labor productivity. However, there were not concrete processes to create a clear benefit. Therefore, it cannot move ahead with the preparation of manpower before entering to the industry. It also resulted in unclear and unmanageable management and administrative efficiency.

5. Policy implementation

In term of the policy implementation, they have different characteristics of action plan. It meant that they were has the individual action plan, lack of continuity and also common standards. Furthermore, it can be said that each government is lack of cooperation and integration as the following

(1) At the level of government administration, there was a lack of collaboration with the national policies. The National Economic and Social Development Plan cannot be implemented seriously from the past. As a result, the officers from the government were unable to coordinate and implement policies. This was due to the relocation of the position by political interference in government officials. As a result, the position has a short term and policy changes all the time. The policy implementers were unable to work consistently and ineffectively. In addition, there was unclear responsibility of the government for the direction of the government. This resulted were strongly ineffective management and mover forwarded to the relevant government agencies.

(2) Compliance with the established policy must be based on performance by the competent person. The study of education and training management system found that most of the instructors from the education institute and the development of labor skill department were not have the experiences in the motorcycle industrial and unable to indeed the high technology as well as how to apply the theory to the practical in manufacturing. As the resulted, the instructors cannot improve their ability to catch up the new technology. It was in accordance with the interviewee No.1 (Interview, February 23, 2017) that “the instructors cannot improve their ability, therefore they cannot support needed to the customers and private sectors”, including with the interviewee No.4th, 5th, 6th, 7th, 16th, 17th, 20th, 21st and 22nd (See Appendix A page 299, 300, 304, 305, 307, 308, 309). However, at the present, for those who are required to perform the instructors must be trained and approved by the supervised

body before they can become instructors. At the same time the trainers in the manufacturing, they were understand in their job but it may lack of the ability to effectively convey some knowledge to the trainees or students. This has resulted in obstacles to the development of students' abilities.

While the course designer, it also lacked of practical experience in the industry as well. There was focused only on creating courses in the theoretical. As a result, the course was not complete and in accordance with the needs of the industry. According to interviewees No. 26 (interview, March 14, 2017), “curriculum designers were lack of practical knowledge in the industry” and “educational policy makers were lack of real understanding in the industry. The reason was unable to collaborate with the private sector even establishment the working group. It was impossible to find the best solution to solve these problems in the previous”. This was in consistent with the idea of the 3rd, 4th, 6th, and 8th 12th, 13th, 15th, 16th, 17th, 20th, 21st and 24th interviewees. (See Appendix A page 298, 299, 300, 301, 302, 303, 304, 305, 307, 308, 310).

From the situation and the problems mentioned above. This leads to a review of the effectiveness of labor and the effectiveness of the cooperation between the government and private sectors based on the questionnaire. The results are summarized in each of the following.

Based on the study to assess the consistency between the preparation of the education curriculum in the preparation of manpower and the skill of the workers in the industrial sector, the results of vocational curriculum management can be summarized as shown in Table 4.6 and the bachelor degree as shown in Table 4.7

Table 4.6 Results of curriculum management in vocational education

Subject	standard score	The result			Frequency/(Percentage)					N=95
		Mean	SD		5	4	3	2	1	
The curriculum management program can create the knowledge to work in the motorcycle manufacturing industry	2.61	2.09 (Low)	.32856		0	0	10(1.1)	84(88.4)	1(1.1)	
The curriculum management can create necessary of labor skills to work in the motorcycle manufacturing industry	2.61	2.02 (Low)	.20520		0	0	3(3.2)	91(95.8)	1(1.1)	
Organizing a course in manufacturing will enhance to the students	2.61	4.41 (Excellent)	.53584		41(43.2)	52(54.7)	2(2.1)	0	0	
The provision of educational programs by students practice in the manufacturing is also necessary	2.61	4.57 (Excellent)	.53896		56(58.9)	37(38.9)	2(2.1)	0	0	
The government has adequate education programs to produce labors skilled in the motorcycle manufacturing industry	2.61	1.95 (Low)	.22448		0	0	0	90(94.7)	5(5.3)	
After graduated labors can work immediately by following the operation standard in manufacturing	2.61	1.95 (Low)	.30487		0	0	2(2.1)	86(90.5)	7(7.4)	
The curriculum is a modern technology. Labors can work in manufacturing without the problems	2.61	1.93 (Low)	.26264		0	0	0	88(92.6)	7(7.4)	

Table 4.6 Results of curriculum management in vocational education (cont.)

Subject	standard score	The result		Frequency/(Percentage)					N=95
		Mean	SD	5	4	3	2	1	
Labors need to be trained in a specific technical course from the public sector by the Department of Skill Development and other before entering to work with manufacturing	2.61	2 (Low)	.35729	1(1.1)	0	0	91(95.8)	3(3.2)	
Labors need to be trained in a specific technical course from an manufacturing before working in the motorcycle manufacturing	2.61	4.21 (Excellent)	.78408	34(35.8)	54(56.8)	0	7(7.4)	0	
Government training courses by Department of Skill Development and others will help to increase knowledge of working from the education curriculum of the institution	2.61	2.09 (Low)	.32856	0	0	10(10.5)	84(88.4)	1(1.1)	
Government training courses by Department of Skill Development and others will help to increase labor skills from the curriculum of the institution	2.61	1.77 (Least)	.64334	0	0	11(11.6)	51(53.7)	33(34.7)	
Government training courses by Department of Skill Development and others will affect and increase labor skill development which have a value for sending labor for training	2.61	2 (Low)	.20628	0	0	2(2.1)	91(95.8)	2(2.1)	
		2.58 (Low)							

Table 4.7 Results of curriculum management in Under Graduated

Details	The result			Frequency/(Percentage)					N=95
	standard score	Mean	SD	5	4	3	2	1	
The curriculum management program can create the knowledge to work in the motorcycle manufacturing industry	2.61	2.21 (Low)	.43503	0	0	21(22.1)	73(76.8)	1(1.1)	
The curriculum management can create necessary of labor skills to work in the motorcycle manufacturing industry	2.61	2.14 (Low)	.57631	3(3.2)	0	5(5.3)	86(90.5)	1(1.1)	
Organizing a course in manufacturing will enhance to the students	2.61	4.36 (Excellent)	.58192	39(41.1)	51(53.7)	5(5.3)	0	0	
The provision of educational programs by students practice in the manufacturing is also necessary	2.61	4.58 (Excellent)	.69666	54(56.8)	32(33.7)	8(8.4)	1(1.1)	0	
The government has adequate education programs to produce labors skilled in the motorcycle manufacturing industry	2.61	2.13 (Low)	.46682	0	0	17(17.9)	73(76.8)	5(5.3)	
After graduated labors can work immediately by following the operation standard in manufacturing	2.61	0.47 (Least)	.31499	0	0	1(1.1)	85(89.5)	9(9.5)	
The curriculum is a modern technology. Labors can work in manufacturing without the problems	2.61	1.93 (Low)	.26264	0	0	0	88(92.6)	7(7.4)	

Table 4.7 Results of curriculum management in Under Graduated (cont.)

Details	The result		Frequency/(Percentage)					N=95
	standard score	Mean	SD	5	4	3	2	1
The curriculum management program can create the knowledge to work in the motorcycle manufacturing industry	2.61	2.21 (Low)	.43503	0	0	21(22.1)	73(76.8)	1(1.1)
The curriculum management can create necessary of labor skills to work in the motorcycle manufacturing industry	2.61	2.14 (Low)	.57631	3(3.2)	0	5(5.3)	86(90.5)	1(1.1)
Organizing a course in manufacturing will enhance to the students	2.61	4.36 (Excellent)	.58192	39(41.1)	51(53.7)	5(5.3)	0	0
The provision of educational programs by students practice in the manufacturing is also necessary	2.61	4.58 (Excellent)	.69666	54(56.8)	32(33.7)	8(8.4)	1(1.1)	0
The government has adequate education programs to produce labors skilled in the motorcycle manufacturing industry	2.61	2.13 (Low)	.46682	0	0	17(17.9)	73(76.8)	5(5.3)
After graduated labors can work immediately by following the operation standard in manufacturing	2.61	0.47 (Least)	.31499	0	0	1(1.1)	85(89.5)	9(9.5)
The curriculum is a modern technology. Labors can work in manufacturing without the problems	2.61	1.93 (Low)	.26264	0	0	0	88(92.6)	7(7.4)

Table 4.7 Results of curriculum management in Under Graduated (cont.)

Details	The result		Frequency/(Percentage)						N=95
	standard score	Mean	SD	5	4	3	2	1	
Labors need to be trained in a specific technical course from the public sector by the Department of Skill Development and other before entering to work with manufacturing	2.61	2.00 (Low)	.35729	1(1.1)	0	0	91(95.8)	3(3.2)	
Labors need to be trained in a specific technical course from an manufacturing before working in the motorcycle manufacturing	2.6	4.22 (Excellent)	.78793	35(36.8)	53(55.8)	0	7(7.4)	0	
Government training courses by Department of Skill Development and others will help to increase knowledge of working from the education curriculum of the institution	2.6	2.05 (Low)	.26771	0	0	6(6.3)	88(92.6)	1(1.1)	
Government training courses by Department of Skill Development and others will help to increase labor skills from the curriculum of the institution	2.6	1.73 (Least)	.59147	0	0	7(7.4)	55(57.9)	33(34.7)	
Government training courses by Department of Skill Development and others will affect and increase labor skill development which have a value for sending labor for training	2.6	2.00 (Low)	.20628	0	0	2(2.1)	91(95.8)	2(2.1)	
		2.48 (Low)							

The assessment of the consistency between the preparation of the education curriculum in the preparation of manpower and the skill of the labor required by industry at the vocational and the bachelor degree is divided the results of the curriculum into 12 areas

1. Create knowledge in the motorcycle manufacturing industry
2. Create the labor skill in the motorcycle manufacturing industry
3. Increase the labor skill by practicing in motorcycle manufacturing industry
4. Need to practice in motorcycle manufacturing industry
5. The relevance of the curriculum of the motorcycle
6. Able to work in motorcycle manufacturing industry after graduated
7. The curriculum is modern and related to the high technology
8. The need for training in specific professional job or technical courses from the public sector by the Department of Skill Development and other related before entering to the industry.
9. The need for training in a specific vocational or technical course from manufacturer before working in motorcycle manufacturing industry.
10. Increase the knowledge of working environment from the education curriculum and training program by the Department of Skill Development and others.
11. Create labor skills to work from the educational curriculum of the institution through the training program of the government by the Department of Skill Development and others.
12. Improved labor skills development. It was well worth the cost of sending labor to be trained in public sector training programs by the Department of Skill Development and others involved.

The results of vocational education evaluation at vocational level showed that most of the results had average scores lower than the standard. The average was from 1.77 to 2.09, except for the increase in work skills in the manufacturing, necessity of practice in the manufacturing and need for training in a specific professional job or technical course from manufacturing before working in motorcycle industry, resulting in the highest level of labor skill development. The average score was 4.21-4.57. Meanwhile, the bachelor level shown that most of the

results had scores lower than the standard. The average was from 0.47 to 2.21, except for the increase in work skills in the manufacturing, necessity of practice in the manufacturing and need for training in a specific professional job or technical course from manufacturing before working in motorcycle industry, resulting in the highest level of labor skill development. The average was from 4.22-4.58, as shown in Figure 4.1.

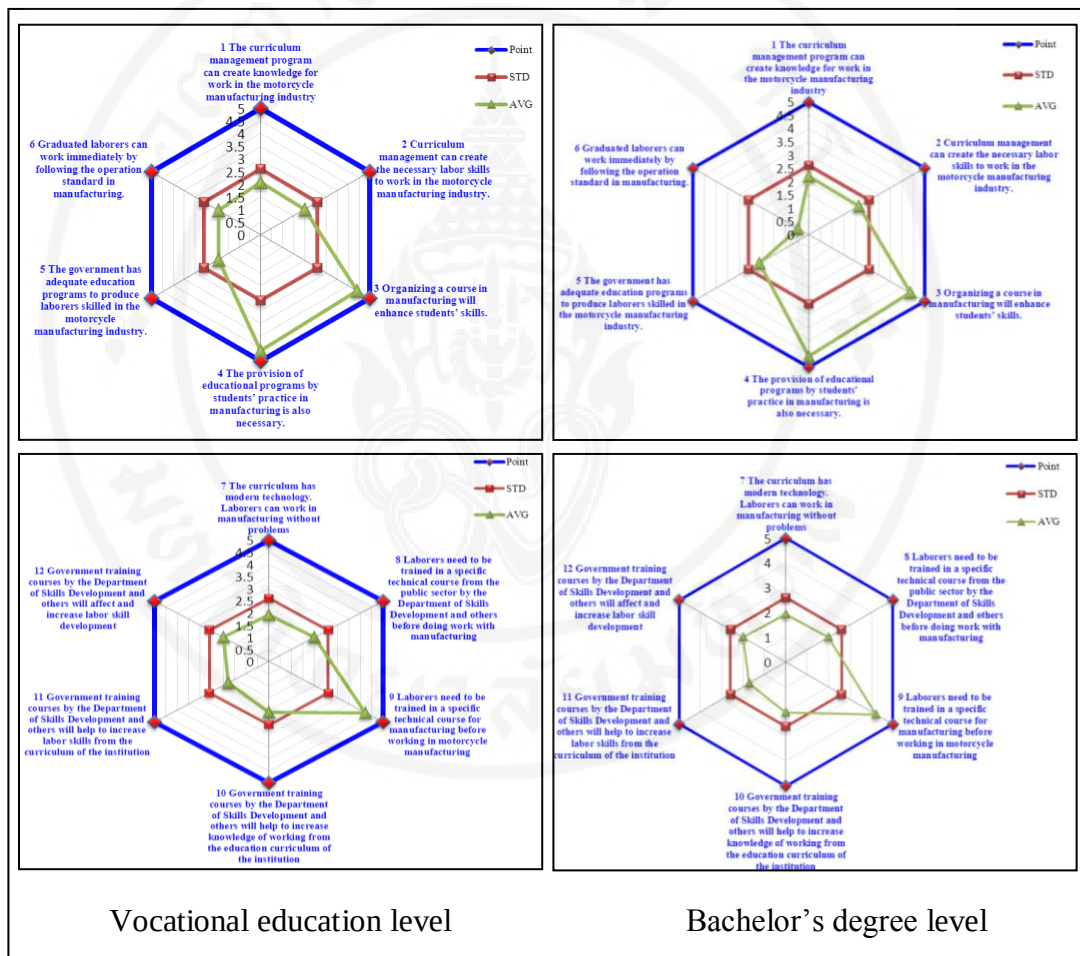


Figure 4.1 Result of vocational education (vocational certificate, higher vocational certificate) and bachelor's degree curriculum management

In term of this study in accordance with the private sector needed, the assessment of the consistency between the provision of education courses in the preparation of manpower and the needs of the private sector at the vocational and the bachelor level is divided by the following 6 issues.

1. Create the knowledge of labor to meet the needs of the motorcycle manufacturing industry.
2. Create the labor skill to meet the needs of the motorcycle manufacturing industry.
3. There is no need for government training by the Department of Skill Development and others.
4. No further training required from the motorcycle manufacturing industry.
5. Enhance the labor skills for the specific job and meet the needs of the manufacturing with government-sponsored training programs by the Department of Skill Development and other related organizations.
6. Sufficiency responds to the need of manufacturer to dispatch associates to train by the Department of Skill Development and others.

The results of vocational level showed that most of the results had average scores lower than the standard. The average was from 1.55 to 2.01, except there was no need for government training by the Department of Skill Development and more related to the high level of compliance results. The average score was 3.96, as shown in Table 4.8. Meanwhile, the bachelor level that most of the scores were lower than the standard, the average was from 1.55 to 2.01, except there was no need for government training by the Department of Skill Development and more related to the high level of compliance results. The average is 4.01, as shown in Table 4.9 and Figure 4.2.

Table 4.8 Consistence with the demands of private sector in the management of vocational education

Details	Consistence			Frequency/(Percentage)					
	standard score	Mean	SD	5	4	3	2	1	N=95
The curriculum is able to create knowledge to meet the needs of the motorcycle manufacturing industry	2.61	2.01 (Low)	.17833	0	0	2(2.1)	92(96.8)	1(1.1)	
The curriculum can create skills to meet the needs of the motorcycle manufacturing industry	2.61	2.01 (Low)	.17833	0	0	2(2.1)	92(96.8)	1(1.1)	
labors entering the motorcycle industry do not need to receive government training from the Department of Skill Development and others	2.61	3.96 (High)	.28864	2(2.1)	87(91.6)	6(6.3)	0	0	
Labor entering to the motorcycle industry does not require further training from the manufacturer	2.61	1.55 (Least)	.50039	0	0	0	52(54.7)	43(45.3)	
Government training courses by Department of Skill Development and others will encourage the necessary skill for the labors and meet the manufacturing requirement	2.61	1.95 (Low)	.22448	0	0	0	90(94.7)	5(5.3)	
Government training courses by Department of Skill Development and others will have enough to respond to the manufacturer's need to send employees into training	2.61	1.84 (Low)	.36658	0	0	0	80(84.2)	15(15.8)	
2.22 (Low)									

Table 4.9 Consistence with the demands of private sector in the management of bachelor's degree

Consistence			Frequency/(Percentage)					N=95
Details	standard score	Mean	SD	5	4	3	2	1
The curriculum is able to create knowledge to meet the needs of the motorcycle manufacturing industry	2.61	2.01 (Low)	.17833	0	0	2(2.1)	92(96.8)	1(1.1)
The curriculum can create skills to meet the needs of the motorcycle manufacturing industry	2.61	2.01 (Low)	.17833	0	0	2(2.1)	92(96.8)	1(1.1)
Labors entering the motorcycle industry do not need to receive government training from the Department of Skill Development and others	2.61	4.01 (High)	.37173	7(7.4)	82(86.3)	6(6.3)	0	0
Labor entering to the motorcycle industry does not require further training from the manufacturer	2.61	1.55 (Least)	.50039	0	0	0	52(54.7)	43(45.3)
Government training courses by Department of Skill Development and others will encourage the necessary skill for the labors and meet the manufacturing requirement	2.61	1.95 (Low)	.22448	0	0	0	90(94.7)	5(5.3)
Government training courses by Department of Skill Development and others will have enough to respond to the manufacturer's need to send employees into training	2.61	1.85 (Low)	.35635	0	0	0	81(85.3)	14(14.7)
2.23 (Low)								

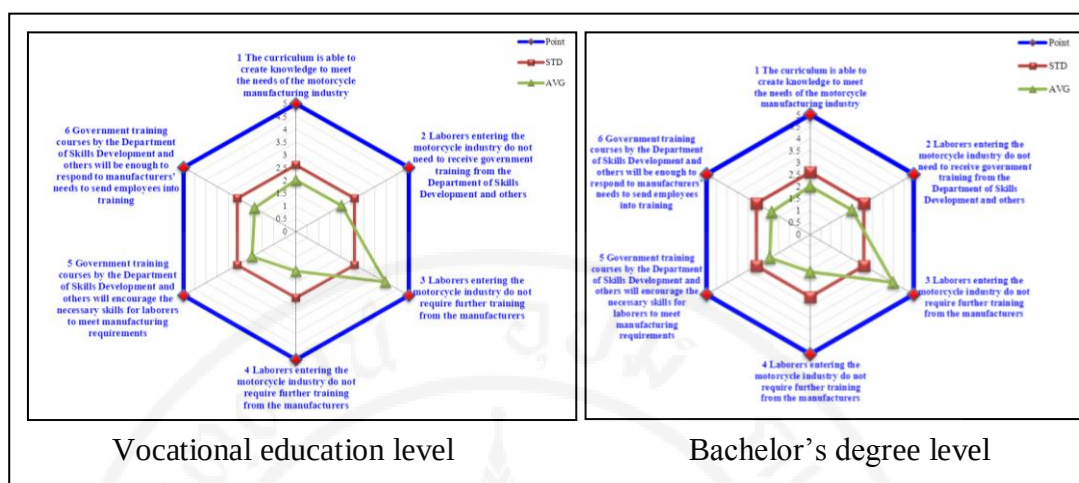


Figure 4.2 Represents the results of consistence to the demands of the private sector of vocational education (vocational certificate, higher vocational certificate) and bachelor's degree curriculum

In term of participation of the government activities, it was evaluated in 4 issues as follow

1. The labors were attended in public sector training programs by Department of Skill Development and others by their own before working at the manufacturing.
2. The necessity of manufacturer was to send labor to be trained in government training programs by the Department of Skill Development and others before working at manufacturing.
3. The manufacturers need to train the associates to improve the labor skill.
4. The manufacturers need to provide their own training program to improve their labor skill.

The results of participation of the government activities at the vocational level showed that most of the results had average scores lower than the standard. The average was from 1.52 to 1.94, except for internal training program in the manufacturing to enhance labor skills. The result was the highest level. The average score was 4.61 as shown in Table 4.10. Meanwhile, the bachelor level, most of the scores were lower than the standard. The average was from 1.52 to 1.94. However, the issue of internal training program in the manufacturing to enhance labor skills. The result was the highest level. The average score was 4.62 as shown in Table 4.11 and Figure 4.3.

Table 4.10 Results from attending the activities of the public sector in the management of vocational education

Details	Results from attending the activities			Frequency/(Percentage)					N=95
	standard score	Mean	SD	5	4	3	2	1	
Before working in motorcycle industrial, labors are already trained in public sector training programs by the Department of Skill Development and others.	2.61	1.74 (Least)	.44268	0	0	0	70(73.7)	25(26.3)	
Before working in motorcycle industrial, it is necessary to send associates to be trained in government training programs by the Department of Skill Development and others	2.61	1.52 (Least)	.50240	0	0	0	49(51.6)	46(48.4)	
To enhance skills and the capacity of the labor, the manufacturer will use government training services provided by the Department of Skill Development and others	2.61	1.94 (Low)	.24454	0	0	0	89(93.7)	6(6.3)	
To enhance skills and the capacity of the labor, the manufacturer will train associates within the company	2.61	4.61 (Excellent)	.49022	58(61.1)	37(38.9)	0	0	0	
			2.45 (Low)						

Table 4.11 Results from attending the activities of the public sector in the management of bachelor's degree

Details	Results from attending the activities			Frequency/(Percentage)					N=95
	standard score	Mean	SD	5	4	3	2	1	
Before working in motorcycle industrial, labors are already trained in public sector training programs by the Department of Skill Development and others.	2.61	1.74 (Low)	.44268	0	0	0	70(73.7)	25(26.3)	
Before working in motorcycle industrial, it is necessary to send associates to be trained in government training programs by the Department of Skill Development and others	2.61	1.52 (Least)	.50240	0	0	0	49(51.6)	46(48.4)	
To enhance skills and the capacity of the labor, the manufacturer will use government training services provided by the Department of Skill Development and others	2.61	1.94 (Low)	.24454	0	0	0	89(93.7)	6(6.3)	
To enhance skills and the capacity of the labor, the manufacturer will train associates within the company	2.61	4.62 (Excellent)	.48770	59(62.1)	36(37.9)	0	0	0	
2.45 (Low)									

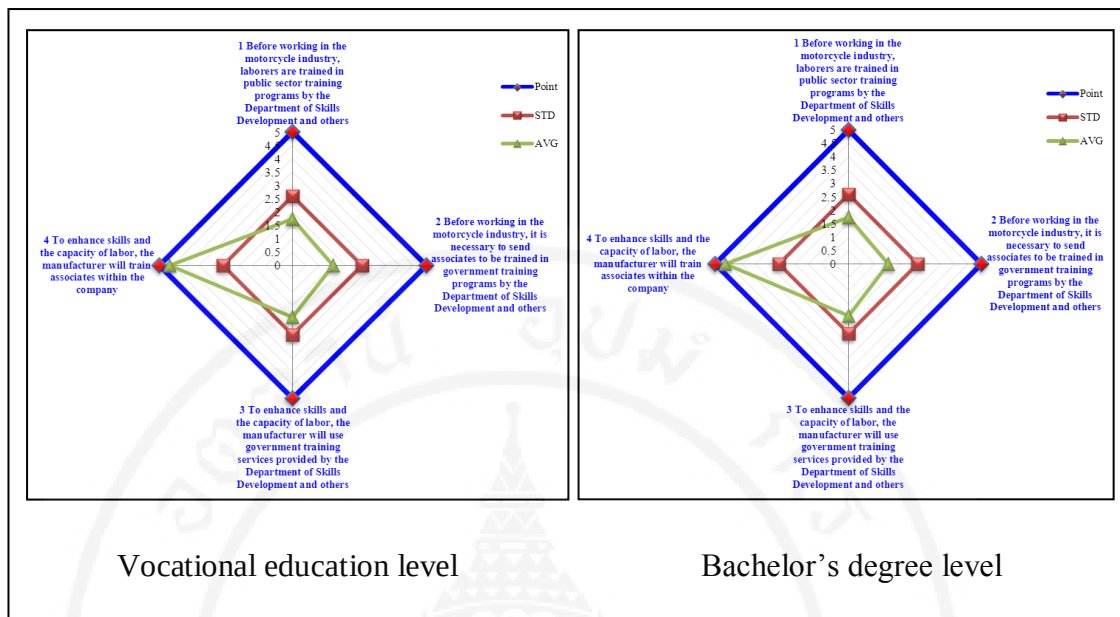


Figure 4.3 Represents the participation in the activities of the public sector of the vocational education (vocational certificate, higher vocational certificate) and bachelor's degree curriculum

In addition, the study of the effects of participation in activities organized by the government and private sector in terms of cooperation in the overall curriculum had 13 issues as follow

1. The private sector is provided and cooperated the curriculum with the government under the education institute and the Department of Skill Development.
2. There were clear rules and regulations to provide educational programs in cooperation between both sides under the education institutions and the Department of Skill Development and others.
3. Organizing educational programs with the public sector by educational institutions and Department of Skill Development and others is involved to improve the labor skill.
4. Organizing educational programs with the public sector by educational institutions and Department of Skill Development and others did not need for the private sector to provide the training program for associates before working in manufacturing.

5. Organizing educational programs with the public sector by educational institutions and Department of Skill Development and others is appropriated.

6. To exchange the knowledge and technology between the government and private sector under the cooperation.

7. Able to have the labor skill after graduated courses under cooperation between the government and private sector.

8. Voluntary sending of workers to government training by Department of Skill Development and others as always.

9. Government training courses by Department of Skill Development and others is relevant responses to the skill needs of workers in the private sector.

10. Government training courses by Department of Skill Development and others needed the private sector involved in transfer of knowledge.

11. Government training courses by Department of Skill Development and others needed the private sector involved in transfer of technology.

12. Government training courses by Department of Skill Development and others needed the private sector involved in supporting the materials and equipment to produce the training.

13. Joint training program between government sector by Department of Skill Development and others is enhanced more labor-intensive than government-organized training courses.

The results of cooperation between the government and private sector in the vocational education curriculum found that the majority of results were lower than the standard scores. The average scores were from 1.56 to 2.15, with the highest scores at 4.58–4.68 shown that the private sector should involve in the transfer of knowledge and technology transfer. It meant the cooperation between the government and private sector will more increase and improve the labor skill than government provided.

In term of the bachelor level found that the majority of results were lower than the standard scores. The average scores were from 1.56 to 2.31, with the highest scores at 4.56–4.67 shown that the private sector should involve in the transfer of knowledge and technology transfer. It meant the cooperation between the government and private sector will more increase and improve the labor skill than government provided as shown at the Table 4.12, 4.13 and Figure 4.4

Table 4.12 Results of participation in the activities arranged from the cooperation between the public and private sector in the vocational education arrangement

Details	Results of co-curriculum arrangement			Frequency/(Percentage)					N=95
	standard score	Mean	SD	5	4	3	2	1	
The education programs by the private sector are organized and cooperate with the public education institute and skill development departments	2.61	2.15 (Low)	1.02073	0	8(8.4)	33(34.7)	19(20.0)	35(36.8)	
Organizing educational programs with the public sector under the education institutes and Department of Skill Development and others will have laws and regulations clearly support	2.61	2.88 (Moderate)	.79711	1(1.1)	22(23.2)	37(38.9)	35(36.8)	0	
Organizing educational programs with the public sector under the Education Institutes and Department of Skill Development and others will increase the labor skill	2.61	2.28 (Low)	1.19985	1(1.1)	20(21.1)	19(20.0)	20(21.1)	35(36.8)	
Organizing educational programs with the public sector under the Education Institutes and Department of Skill Development and others, the private sector does not have to train labors before working at the manufacturing	2.61	2.15 (Low)	1.10095	0	13(13.7)	26(27.4)	18(18.9)	38(40.0)	
Organizing educational programs with the public sector under the Education Institutes and Department of Skill Development and others is appropriate	2.61	1.59 (Least)	.49454	0	0	0	56(58.9)	39(41.1)	
The cooperation between public-private for curricula will exchange of knowledge and technology	2.61	2.86 (Moderate)	1.50609	5(5.3)	51(53.7)	0	4(4.2)	35(36.8)	

Table 4.12 Results of participation in the activities arranged from the cooperation between the public and private sector in the vocational education arrangement (cont.)

Details	Results of co-curriculum arrangement			Frequency/(Percentage)					N=95
	standard score	Mean	SD	5	4	3	2	1	
The result of the co-curricular program will increase labors skill after graduated	2.61	2.81 (Moderate)	1.46806	3(3.2)	50(52.6)	3(3.2)	4(4.2)	35(36.8)	
The manufacturer will send the associates to be trained by the Department of Skill Development and others	2.61	1.56 (Least)	.49927	0	0	0	53(55.8)	42(44.2)	
Government training courses by Department of Skill Development and others will response the needs of labor skill in the private sector	2.61	1.61 (Least)	.49022	0	0	0	58(61.1)	37(38.9)	
Government training courses by Department of Skill Development and others needed the private sector get involved in the transfer of knowledge	2.61	4.68 (Excellent)	.46730	65(68.4)	30(31.6)	0	0	0	
Government training courses by Department of Skill Development and others needed the private sector get involved in technology transfer	2.61	4.67 (Excellent)	.47135	64(67.4)	31(32.6)	0	0	0	
Government training courses by Department of Skill Development and others is necessary to the private sector to participate in supporting the materials to enhance the operation for training the trainees	2.61	4.58 (Excellent)	.53751	57(60.0)	36(37.9)	2(2.1)	0	0	
Joint training program between government sector by Department of Skill Development and others and private will increase labors skill more than training courses by the government	2.61	4.58 (Excellent)	.53751	57(60.0)	36(37.9)	2(2.21)	0	0	
	2.95 (Moderate)								

Table 4.13 Results of participation in the activities arranged from the cooperation between the public and private sector in the arrangement of bachelor's degree

Details	Results of co-curriculum arrangement			Frequency/(Percentage)				
	standard score	Mean	SD	5	4	3	2	1
The education programs by the private sector are organized and cooperate with the public education institute and skill development departments	2.61	1.89 (Low)	.79190	0	0	25(26.3)	35(36.8)	35(36.8)
Organizing educational programs with the public sector under the education institutes and Department of Skill Development and others will have laws and regulations clearly support	2.61	2.89 (Moderate)	.80522	1(1.1)	23(24.2)	36(37.9)	35(36.8)	0
Organizing educational programs with the public sector under the Education Institutes and Department of Skill Development and others will increase the labor skill	2.61	2.03 (Low)	1.20349	1(1.1)	20(21.1)	21(22.1)	18(18.9)	35(36.8)
Organizing educational programs with the public sector under the Education Institutes and Department of Skill Development and others, the private sector does not have to train labors before working at the manufacturing	2.61	2.31 (Low)	1.06644	0	12(12.6)	19(20.0)	24(25.3)	40(42.1)
Organizing educational programs with the public sector under the Education Institutes and Department of Skill Development and others is appropriate	2.61	2.86 (Moderate)	.49454	5(5.3)	51(53.7)	0	4(4.2)	35(36.8)
The cooperation between public-private for curricula will exchange of knowledge and technology	2.61	1.59 (Least)	1.50609	0	0	0	56(58.9)	39(41.1)
The result of the co-curricular program will increase labors skill after graduated	2.61	2.81 (Moderate)	1.46806	3(3.2)	50(52.6)	3(3.2)	4(4.2)	35(36.8)

Table 4.13 Results of participation in the activities arranged from the cooperation between the public and private sector in the arrangement of bachelor's degree (cont.)

Details	Results of co-curriculum arrangement			Frequency/(Percentage)				
	standard score	Mean	SD	5	4	3	2	1
The manufacturer will send the associates to be trained by the Department of Skill Development and others	2.61	1.56 (Least)	.49927	0	0	0	53(55.8)	42(44.2)
Government training courses by Department of Skill Development and others will response the needs of labor skill in the private sector	2.61	1.56 (Least)	.49927	0	0	0	53(55.8)	42(44.2)
Government training courses by Department of Skill Development and others needed the private sector get involved in the transfer of knowledge	2.61	4.67 (Excellent)	.47135	64(67.4)	31(32.6)	0	0	0
Government training courses by Department of Skill Development and others needed the private sector get involved in technology transfer	2.61	4.67 (Excellent)	.47135	64(67.4)	31(32.6)	0	0	0
Government training courses by Department of Skill Development and others is necessary to the private sector to participate in supporting the materials to enhance the operation for training the trainees	2.61	4.56 (Excellent)	.54021	55(57.9)	38(40.0)	2(2.1)	0	0
Joint training program between government sector by Department of Skill Development and others and private will increase labors skill more than training courses by the government	2.61	4.58 (Excellent)	.53751	57(60.0)	36(37.9)	2(2.1)	0	0

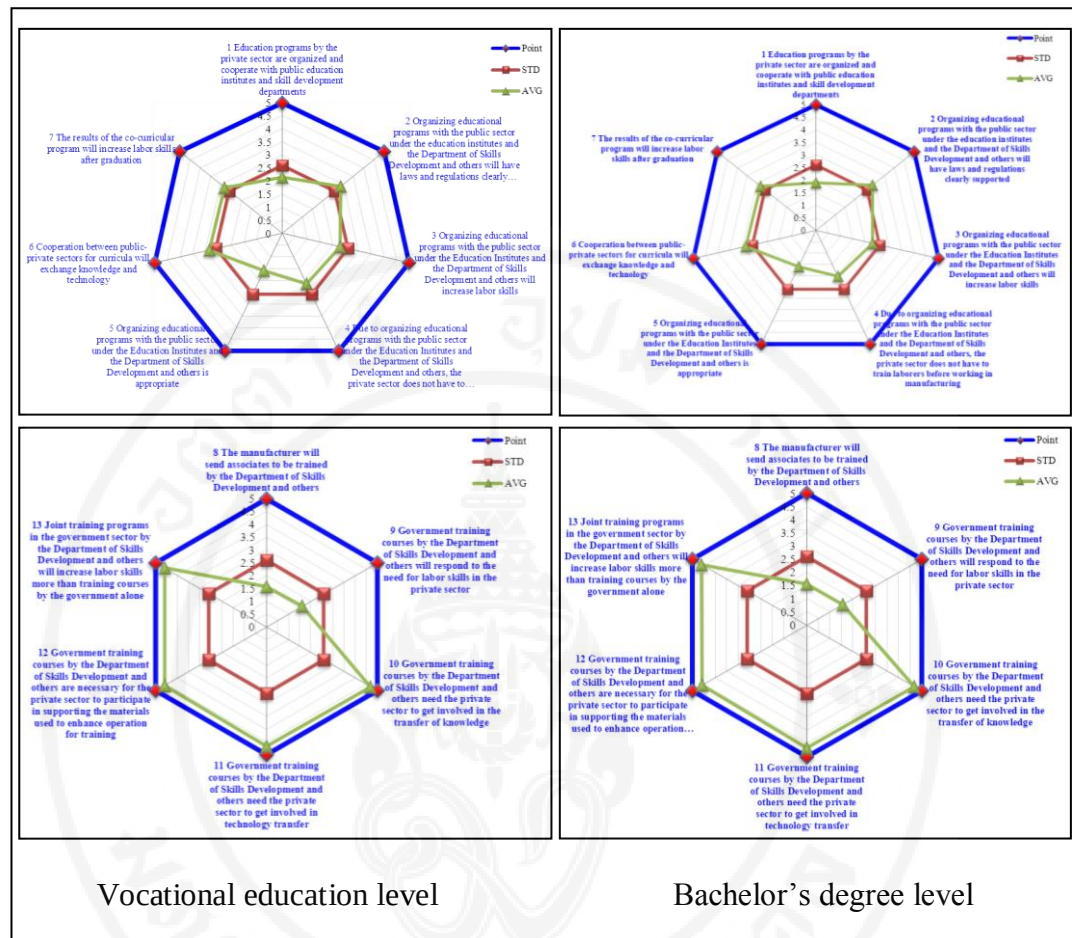


Figure 4.4 Represents the results of co-curriculum arrangement in vocational education (vocational certificate, higher vocational certificate) level and bachelor's degree level

In term of the competition skill/skill testing is assessed in 4 areas

1. The private sector is participated in a competition skill/skill testing
2. Competition/skill testing will help to improve the labor skills
3. Competition/skill testing will transfer the knowledge and technology between the government and private sector
4. Competition/skill testing will transfer the knowledge and technology between labor and student

The results of participation in the governmental activities at the vocational level in term of competitions/skill testing showed that the results were mostly at a high level. The average score ranged from 3.71 to 3.98, while the private sector participated in the skill test. The average scores were 3.01.

In term of the bachelor level found that the results were mostly at a high level. The average scores were 3.58–3.84, while the private sector participated in the skill test. The average scores were 3.03. It shown at the Table 4.14 and Figure 4.5



Table 4.14 Results of participation in the contest on level /skill test in the vocational education arrangement

Results of participation in the contest/test			Frequency/(Percentage)					N=95
Details	standard score	Mean	SD	5	4	3	2	1
Participated in a skill test under the Department of Skill Development	2.61	3.01 (Moderate)	1.15312	14(14.7)	18(18.9)	21(22.1)	39(41.1)	3(3.2)
Competition /skill testing will help to improve the labor skills base on new technology	2.61	3.71 (High)	.79725	14(14.7)	45(47.4)	30(31.6)	6(6.3)	0
Competition /skill testing will bring the transfer of knowledge and technology between the public and private sectors	2.61	3.98 (High)	.77155	22(23.2)	54(56.8)	14(14.7)	5(5.3)	0
Competition / skill testing will transfer of knowledge and technology between skilled labor and those who are still studying	2.61	3.93 (High)	.80215	21(22.1)	52(54.7)	16(16.8)	6(6.3)	0
3.65 (Moderate)								

Table 4.15 Results of participation in the contest on level / skill test in the arrangement of bachelor's degree

Details	Results of participation in the contest/test			Frequency/(Percentage)				
	standard score	Mean	SD	5	4	3	2	1
Participated in a skill test under the Department of Skill Development	2.61	3.03 (Moderate)	1.12470	12(12.6)	22(23.2)	21(22.1)	37(38.9)	3(3.2)
Competition /skill testing will help to improve the labor skills base on new technology	2.61	3.58 (Moderate)	.79331	12(12.6)	37(38.9)	40(42.1)	6(6.3)	0
Competition /skill testing will bring the transfer of knowledge and technology between the public and private sectors	2.61	3.79 (Moderate)	.84921	20(21.1)	41(43.2)	28(29.5)	6(6.3)	0
Competition / skill testing will transfer of knowledge and technology between skilled labor and those who are still studying	2.61	3.84 (Moderate)	.78977	19(20.0)	46(48.4)	26(27.4)	4(4.2)	0
	3.56 (Moderate)							

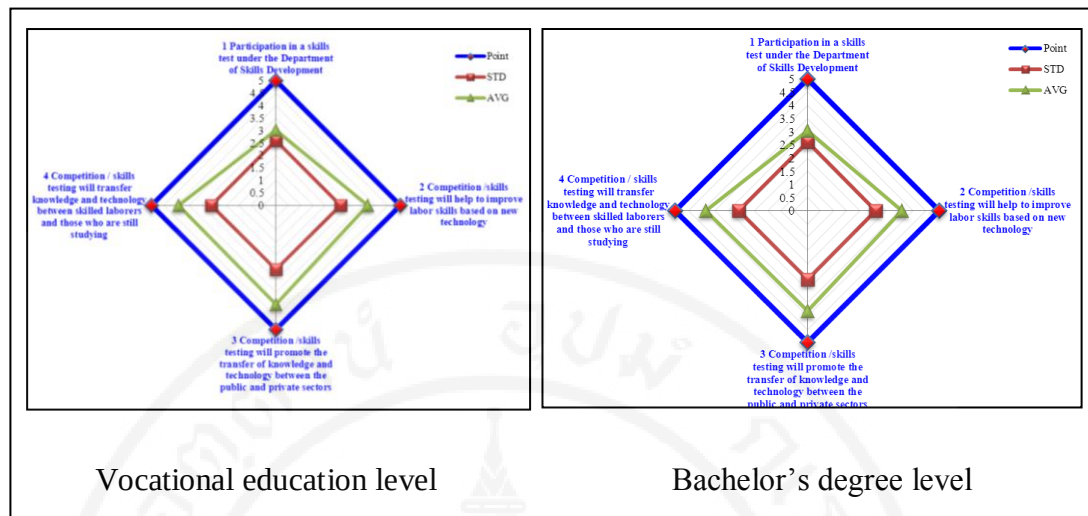


Figure 4.5 Represents the competition to measure the level/test the skills in the vocational education (vocational certificate, higher vocational certificate) level and bachelor' degree

Based on the results, it is found that the provision of education and post-training was still essential. Most of the training was in-house training rather than sending workers to the Department of Skill Development or other relevant government agencies. In addition to the policy makers was specific to the theoretical rather than practical. Another factor was offered to the educational institutions to open the general automotive course. The resulted of this issue was affected to the curriculum which is below the standard, including the instructors, equipment and machinery. Moreover, the curriculum developers have theoretical knowledge and understanding well, but they also face problems in the design of practical curriculums due to lack of the experience in manufacturing. Therefore, this situation have affected to the ability of the development of the students. However, the course in automotive design was a modern curriculum that students can apply to work in the current organization. But courses related to industrial operations such as mechanical, electric motor is ineffective.

According to this study of the consistency between labor knowledge and the industry needed to accompany qualitative research found that there was a need for training from the manufacturer before working in manufacturing both of vocational and undergraduate. The results were at a highest as Table 4.16 and Table 4.18.

At the same time, the performance evaluation of the labor skill was divided to 8 issues as follow

1. General knowledge of Motorcycle Production System
2. Knowledge of Welding
3. Knowledge of Painting
4. Knowledge of Engine-Frame body
5. Knowledge of Die-casting
7. Knowledge of Quality Inspection
8. Knowledge of Maintenance and Applicable

The results of the assessment showed that the general knowledge about the production of motorcycles. The labor skill was below standard level. The average score was 1.68–2.52. Meanwhile, the labor skill was average level. It had 2 issues as follow: personal protective equipment was average score of 2.76, and average score of 2.80 for conducting of measuring tools. The results of the assessment on welding knowledge and skills found that the labor skill was below standard level. The average score was from 2.20 to 2.25 as well as the knowledge and skills of painting was 2.29–2.45. For the knowledge and skills of engine and frame-body was average score of 2.30–2.33, knowledge of die-casting was 2.18 to 2.30, knowledge of machining was 1.95–2.51, knowledge of quality inspection was 1.95–2.51, and knowledge of maintenance and application of knowledge was 1.27–2.19 respectively as shown in Tables 4.17 and Figure 4.6.

Table 4.16 Necessity in training from the workplace prior to starting work in the vocational education level (vocational certificate, higher vocational certificate)

Details	Levels of comments		Frequency/(Percentage)					N=305
	standard score	Mean	SD	5	4	3	2	1
Need training from the manufacturer before working	2.61	4.68 (Excellent)	.49508	211(69.2)	90(29.5)	4(1.3)	0	0

Table 4.17 Competences of labor in the vocational education level (vocational certificate, higher vocational certificate)

Details	Levels of competences		Frequency/(Percentage)					N=305
	standard score	Mean	SD	5	4	3	2	1
General knowledge of motorcycle production system								
1) Production process	2.61	2.42 (Low)	.66004	2(0.7)	4(1.3)	134(43.9)	146(47.9)	19(6.2)
2) Health and Safety system	2.61	2.52 (Low)	.60728	1(0.3)	5(1.6)	156(51.1)	133(43.6)	10(3.3)
3) Conduct of personal protective equipment	2.61	2.76 (Moderate)	.60570	0	17(5.6)	209(68.5)	68(22.3)	11(3.6)
4) Conduct of measuring	2.61	2.80 (Moderate)	1.82940	1(0.3)	7(2.3)	204(66.9)	83(27.2)	9(3.0)

Table 4.17 Competences of labor in the vocational education level (vocational certificate, higher vocational certificate) (cont.)

Details	Levels of competences		Frequency/(Percentage)					N=305
	standard score	Mean	SD	5	4	3	2	1
5) Important control points of quality control in the production process	2.61	1.68 (Low)	.41691	1(0.3)	1(0.3)	14(4.6)	263(86.2)	26(8.5)
6) ISO 9001	2.61	1.98 (Low)	.49388	0	1(0.3)	1(0.3)	203(66.6)	100(32.8)
7) ISO 14001	2.61	1.68 (Low)	.50934	0	1(0.3)	3(1.0)	197(64.6)	104(34.1)
		2.26 (Low)						
Knowledge of welding								
1) Basic Welding and welding Process	2.61	2.25 (Low)	.58927	0	2(0.7)	95(31.1)	186(61.0)	22(7.2)
2) Welding of the Mig Manual	2.61	2.22 (Low)	.56440	0	1(0.3)	87(28.5)	196(64.3)	21(6.9)
3) Welding of the Spot	2.61	2.21 (Low)	.58650	0	2(0.7)	85(27.9)	193(63.3)	25(8.2)
4) Welding of Seam	2.61	2.20 (Low)	.58320	0	2(0.7)	83(27.2)	195(63.9)	25(8.2)
5) Basic of conducting Welding Machine	2.61	2.24 (Low)	.59328	0	2(0.7)	92(30.2)	187(61.3)	24(7.9)
		2.22 (Low)						

Table 4.17 Competences of labor in the vocational education level (vocational certificate, higher vocational certificate) (cont.)

Details	Levels of competences		Frequency/(Percentage)					N=305
	standard score	Mean	SD	5	4	3	2	1
Knowledge of painting								
1) Basic machinery	2.61	2.29 (Low)	.62046	1(0.3)	1(0.3)	107(35.1)	173(56.7)	23(7.5)
2) Appearance examination	2.61	2.45 (Low)	.60849	0	5(1.6)	88(28.9)	189(62.0)	23(7.5)
		2.37 (Low)						
Knowledge of Engine - Frame body								
1) Basic of production	2.61	2.32 (Low)	.59745	0	2(0.7)	113(37.0)	171(56.1)	19(6.2)
2) Conduct of equipment to support production	2.61	2.33 (Low)	.61026	0	5(1.6)	108(35.4)	174(57.0)	18(5.9)
3) Know how to assembly of production	2.61	2.30 (Low)	.59450	0	2(0.7)	106(34.8)	177(58.0)	20(6.6)
4) Assembly parts of each production process	2.61	2.31 (Low)	.58779	0	5(1.6)	99(32.5)	186(61.0)	15(4.9)
		2.31 (Low)						
Knowledge of Die-casting								
1) Basic of Die-casting	2.61	2.18 (Low)	.61697	0	3(1.0)	82(26.9)	188(61.6)	32(10.5)

Table 4.17 Competences of labor in the vocational education level (vocational certificate, higher vocational certificate) (cont.)

Details	Levels of competences		Frequency/(Percentage)					N=305
	standard score	Mean	SD	5	4	3	2	1
2) Conduct of tools and equipment	2.61	2.30 (Low)	1.81899	(0.3)	2(0.7)	85(27.9)	185(60.7)	31(10.2)
3) Conduct the basic of Die-casting machine	2.61	2.20 (Low)	.62354	0	2(0.7)	89(29.2)	181(59.3)	33(10.8)
		2.22 (Low)						
Knowledge of Engine machining								
1) Conduct the basic of engine machining	2.61	2.25 (Low)	.57084	0	3(1.0)	88(28.9)	196(64.3)	18(5.9)
2) Type of machining	2.61	2.18 (Low)	.55334	0	3(1.0)	70(23.0)	211(69.2)	21(6.9)
3) Engine parts	2.61	1.95 (Low)	.55709	0	2(0.7)	75(24.6)	206(67.5)	22(7.2)
4) Able to use the monitoring tools for inspection	2.61	2.51 (Low)	.61636	0	4(1.3)	97(31.8)	180(59.0)	24(7.9)
Knowledge of Quality - Inspection								
1) Engine system	2.61	2.19 (Low)	.57454	0	3(1.0)	75(24.6)	203(66.6)	24(7.9)
2) Sound engine inspection	2.61	1.89 (Low)	.47636	0	1(0.3)	16(5.2)	235(77.0)	53(17.4)

Table 4.17 Competences of labor in the vocational education level (vocational certificate, higher vocational certificate) (cont.)

Levels of competences			Frequency/(Percentage)					N=305
Details	standard score	Mean	SD	5	4	3	2	1
3) Detecting malfunction from assembly and deciding to deal with malfunction	2.61	1.95 (Low)	.46297	0	1(0.3)	22(7.2)	242(79.3)	40(13.1)
4) Able to conduct the basic inspection tools	2.61	2.51 (Low)	.60203	0	4(1.3)	162(53.1)	126(41.3)	13(4.3)
2.13 (Little)								
Knowledge of Maintenance and Applicable								
1) Knowledge to operate on themselves	2.61	1.89 (Low)	.42228	0	0	12(3.9)	247(81.0)	46(15.1)
2) Able to use foreign languages related to general job	2.61	1.36 (Least)	.50015	0	0	3(1.0)	103(33.8)	199(65.2)
3) Able to use foreign languages related to technical job	2.61	1.65 (Least)	.51766	0	0	6(2.0)	186(61.0)	113(37.0)
4) Able to maintenance machine, Tools and equipment	2.61	2.19 (Low)	.60418	0	5(1.6)	75(24.6)	198(64.9)	27(8.9)
5) Able to maintenance robot	2.61	2.02 (Low)	.60382	0	2(0.7)	53(17.4)	200(65.6)	50(16.4)
6) Analysis and problem solving of maintenance machine	2.61	1.96 (Low)	.43501	0	1(0.3)	20(6.6)	250(82.0)	34(11.1)

Table 4.17 Competences of labor in the vocational education level (vocational certificate, higher vocational certificate) (cont.)

Details	Levels of competences		Frequency/(Percentage)					N=305
	standard score	Mean	SD	5	4	3	2	1
7) Able to bring knowledge of engineering and technology to apply their job	2.61	2.04 (Low)	.50500	0	5(1.6)	30(9.8)	242(79.3)	28(9.2)
8) Able to control the machine by using the computer	2.61	2.02 (Low)	.53471	0	2(0.7)	40(13.1)	224(73.4)	39(12.8)
9) Able to control the automotive electrical system	2.61	2.04 (Low)	.52418	0	0	48(15.7)	221(72.5)	36(11.8)
10) Able to make a production planning	2.61	1.73 (Least)	.53174	0	1(0.3)	10(3.3)	200(65.6)	94(30.8)
11) Able to evaluate and solve problems in case of the complex level	2.61	1.27 (Least)	.46414	0	0	3(1.0)	75(24.6)	227(74.4)
12) knowledge and skills to work in industry 4.0 or future technology	2.61	1.73 (Least)	.50639	0	0	9(3.0)	205(67.2)	91(29.8)
		1.8 (Low)						

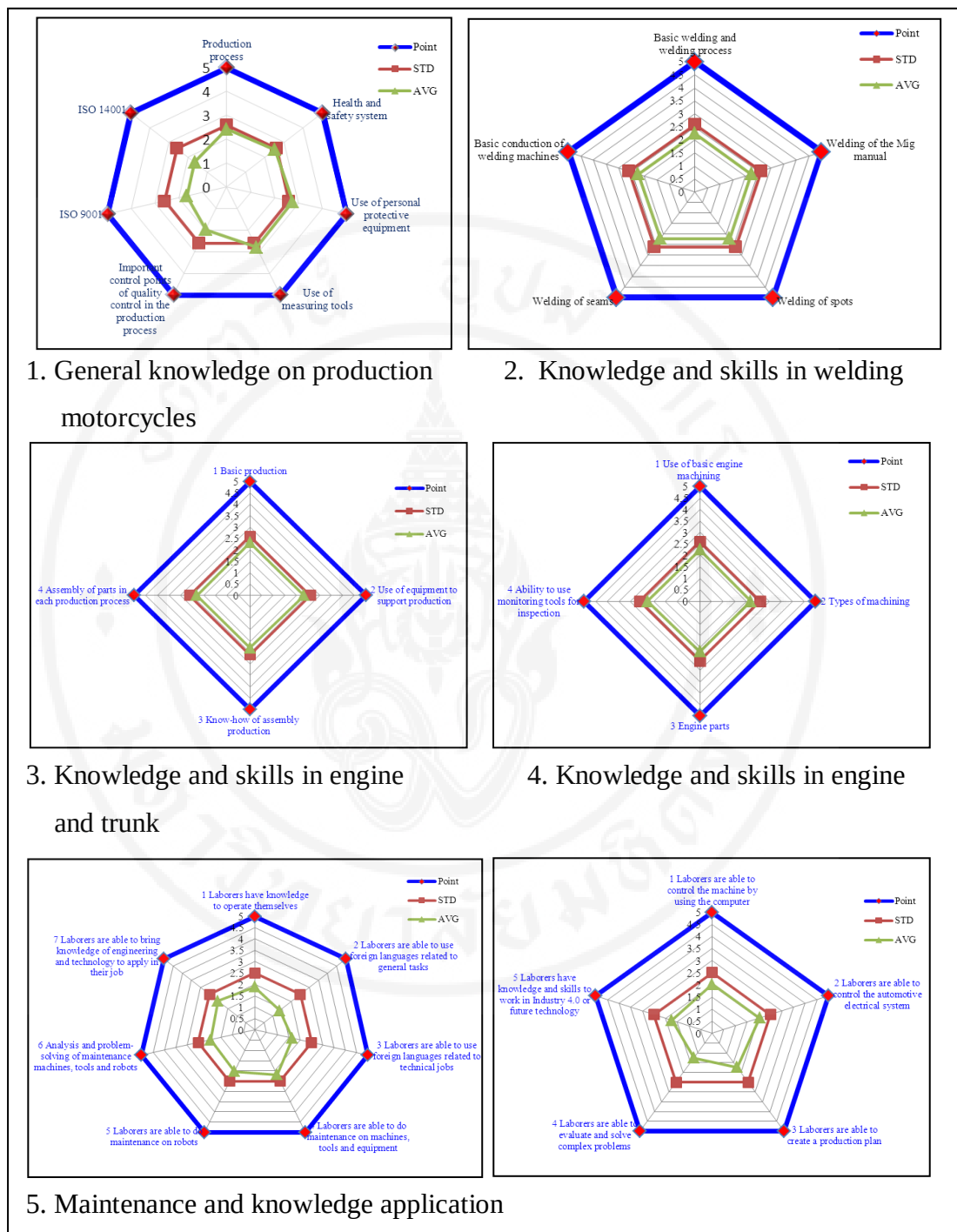


Figure 4.6 Represents the levels of competences of vocational education (vocational certificate, higher vocational certificate) labor

At the same time, the performance evaluation of the labor skill was divided to 8 issues as follow

1. General knowledge of Motorcycle Production System
2. Knowledge of Welding
3. Knowledge of Painting
4. Knowledge of Engine - Frame body
5. Knowledge of Die-casting
7. Knowledge of Quality Inspection
8. Knowledge of Maintenance and Applicable

The result of assessment found that the general knowledge about the production of motorcycles was a standard level. The average score was 2.69–2.98. There were three skills that were lower than the standard level. These were the critical control points of quality control in the production process. The average score was 2.12, ISO 9001 was 1.98 and the ISO 14001 was 1.98. Meanwhile, the assessment of welding knowledge and skills found that the skill level was lower than the standard. The average score ranged from 1.96–2.10 as well as the knowledge and skills of painting. The skill level was lower than the standard as well, the average scores ranged from 2.22–2.45 and knowledge and skills of engine and frame-body, the average score ranged from 2.40–2.55, the knowledge and skills of die-casting, the average score ranged from 2.19–2.26. The average scores ranged from 2.24–2.38 was the machining as lower standard, including the knowledge and skills of quality assurance. The average score ranged from 1.95–2.48, but skills in using standardized monitoring tools were standard. The average score was 2.75 as well as the knowledge and skills of maintenance and application of knowledge was also lower than standard skills. The average scores ranged from 2.21–2.49. However, there were 4 skills at the standard level: control, analysis and problem solving of the maintenance system, applying for engineering knowledge for practical in workplace and computerized control of machinery and production planning. The average score was 2.63–2.81, as shown in Table 4.19 and Figure 4.7.

Table 4.18 Necessity in training from the operating place prior to the start of work in bachelor's degree

Details	Levels of comments		Frequency/(Percentage)				
	standard score	Mean SD	5	4	3	2	1
Need training from the manufacturer before working	2.61	4.58 (Excellent) .60774	194 (63.6)	96(31.5)	13(4.3)	2(0.7)	0

Table 4.19 Competences of labor in bachelor's degree

Details	Levels of competences		Frequency/(Percentage)				
	standard score	Mean SD	5	4	3	2	1
General knowledge of motorcycle production system							
1) Production process	2.61	2.69 (Moderate) .68592	3(1.0)	11(3.6)	199(65.2)	73(23.9)	19(6.2)
2) Health and Safety system	2.61	2.78 (Moderate) .62228	2(0.7)	17(5.6)	209(68.5)	67(22.0)	10(3.3)
3) Conduct of personal protective equipment	2.61	2.98 (Moderate) .59857	1(0.3)	43(14.1)	217(71.1)	38(12.5)	6(2.0)
4) Conduct of measuring	2.61	2.84 (Moderate) .65001	1(0.3)	32(10.5)	199(10.5)	64(21.0)	9(3.0)
5) Important control points of quality control in the production process	2.61	2.12 (Low) 1.22543	1(0.3)	5(1.6)	24(7.9)	258(84.6)	17(5.6)

Table 4.19 Competences of labor in bachelor's degree (cont.)

Details	Levels of competences		Frequency/(Percentage)					N=305
	standard score	Mean	SD	5	4	3	2	1
General knowledge of motorcycle production system								
6) ISO 9001	2.61	1.98 (Low)	.46890	1(0.3)	2(0.7)	18(5.9)	252(82.6)	32(10.5)
7) ISO 14001	2.61	1.98 (Low)	.47945	1(0.3)	2(0.7)	20(6.6)	249(81.6)	33(10.8)
		2.48 (Low)						
Knowledge of welding								
1) Basic Welding and welding Process	2.61	2.06 (Low)	.65407	1(0.3)	5(1.6)	53(17.4)	197(64.6)	49(16.1)
2) Welding of the Mig Manual	2.61	1.97 (Low)	.50547	0	1(0.3)	31(10.2)	230(75.4)	43(14.1)
3) Welding of the Spot	2.61	1.96 (Low)	.50798	0	1(0.3)	30(9.8)	229(75.1)	45(14.8)
4) Welding of Seam	2.61	2.02 (Low)	1.30772	1(0.3)	1(0.3)	29(9.5)	228(74.8)	46(15.1)
5) Basic of conducting Welding Machine	2.61	2.00 (Low)	.54107	0	2(0.7)	38(12.5)	222(72.8)	43(14.1)
6) Conduct of welding robot	2.61	2.04 (Low)	.52077	0	4(1.3)	36(11.8)	234(76.7)	31(10.2)

Table 4.19 Competences of labor in bachelor's degree (cont.)

Details	Levels of competences			Frequency/(Percentage)					N=305
	standard score	Mean	SD	5	4	3	2	1	
7) Adjust the welding process of robot	2.61	2.01 (Low)	.55008	0	5(1.6)	32(10.5)	228(74.8)	40(13.1)	
8) Mold adjustment	2.61	2.01 (Low)	.54099	0	3(1.0)	37(12.1)	225(73.8)	40(13.1)	
9) Conduct the computer programmable of robot	2.61	2.10 (Low)	.62472	0	6(2.0)	59(19.3)	201(65.9)	39(12.8)	
		2.01 (Low)							
Knowledge of painting									
1) Basic machinery	2.61	2.45 (Low)	.66283	0	12(3.9)	131(43.0)	145(47.5)	17(5.6)	
2) Welding of the Mig Manual	2.61	1.97 (Low)	.50547	0	1(0.3)	31(10.2)	230(75.4)	43(14.1)	
3) Welding of the Spot	2.61	1.96 (Low)	.50798	0	1(0.3)	30(9.8)	229(75.1)	45(14.8)	
4) Welding of Seam	2.61	2.02 (Low)	1.30772	1(0.3)	1(0.3)	29(9.5)	228(74.8)	46(15.1)	
5) Basic of conducting Welding Machine	2.61	2.00 (Low)	.54107	0	2(0.7)	38(12.5)	222(72.8)	43(14.1)	
6) Conduct of welding robot	2.61	2.04 (Low)	.52077	0	4(1.3)	36(11.8)	234(76.7)	31(10.2)	

Table 4.19 Competences of labor in bachelor's degree (cont.)

Details	Levels of competences			Frequency/(Percentage)					N=305
	standard score	Mean	SD	5	4	3	2	1	
7) Adjust the welding process of robot	2.61	2.01 (Low)	.55008	0	5(1.6)	32(10.5)	228(74.8)	40(13.1)	
8) Mold adjustment	2.61	2.01 (Low)	.54099	0	3(1.0)	37(12.1)	225(73.8)	40(13.1)	
9) Conduct the computer programmable of robot	2.61	2.10 (Low)	.62472	0	6(2.0)	59(19.3)	201(65.9)	39(12.8)	
		2.01 (Low)							
Knowledge of painting									
1) Basic machinery	2.61	2.45 (Low)	.66283	0	12(3.9)	131(43.0)	145(47.5)	17(5.6)	
2) Appearance examination	2.61	2.38 (Low)	.64349	0	5(1.6)	128(42.0)	150(49.2)	22(7.2)	
3) Able to control the painting machine	2.61	2.22 (Low)	.63047	0	8(2.6)	78(25.6)	193(63.3)	26(8.5)	
4) Conduct the computer programmable of robot	2.61	2.22 (Low)	.71124	0	18(5.9)	86(28.2)	175(57.4)	26(8.5)	
		2.31 (Low)							

Table 4.19 Competences of labor in bachelor's degree (cont.)

Details	Levels of competences		Frequency/(Percentage)					N=305
	standard score	Mean	SD	5	4	3	2	1
Knowledge of Engine - Frame body								
1) Basic of production	2.61	2.55 (Low)	.72448	2(0.7)	18(5.9)	143(46.9)	124(40.7)	18(5.9)
2) Conduct of equipment to support production	2.61	2.50 (Low)	.66452	1(0.3)	9(3.0)	150(49.2)	128(42.0)	17(5.6)
3) Know how to assembly of production	2.61	2.45 (Low)	.64777	0	5(1.6)	149(48.9)	139(42.6)	21(6.9)
4) Assembly parts of each production process	2.61	2.46 (Low)	.64313	0	6(2.0)	147(48.2)	133(43.2)	19(6.2)
5) Using computerized command programming	2.61	2.40 (Low)	.70942	0	20(6.6)	101(33.1)	164(53.8)	20(6.6)
		2.47 (Low)						
Knowledge of Die-Casting								
1) Basic of Die-casting	2.61	2.23 (Low)	.67976	0	8(2.6)	90(29.5)	172(56.4)	35(11.5)
2) Conduct of tools and equipment	2.61	2.19 (Low)	.63440	0	3(1.0)	86(28.2)	181(59.3)	35(11.5)
3) Conduct the basic of Die-casting machine	2.61	2.20 (Low)	.65594	0	6(2.0)	84(27.5)	180(59.0)	35(11.5)

Table 4.19 Competences of labor in bachelor's degree (cont.)

Details	Levels of competences		Frequency/(Percentage)					N=305
	standard score	Mean	SD	5	4	3	2	1
Knowledge of Die-Casting								
4) Analysis and problem solving	2.61	2.26 (Low)	.65908	1(0.3)	6(2.0)	91(29.8)	179(58.7)	28(9.2)
5) Able to use computer programming command	2.61	2.26 (Low)	.70947	1(0.3)	13(4.3)	82(26.9)	178(58.4)	31(10.2)
		2.22 (Low)						
Knowledge of engine machining								
1) Conduct the basic of engine machining	2.61	2.35 (Low)	.66753	1(0.3)	12(3.9)	98(32.1)	176(57.7)	18(5.9)
2) Type of machining	2.61	2.24 (Low)	.57790	0	4(1.3)	84(27.5)	198(64.9)	19(6.2)
3) Engine parts	2.61	2.27 (Low)	.62411	0	5(1.6)	97(31.8)	179(58.7)	24(7.9)
4) Able to use the monitoring tools for inspection	2.61	2.36 (Low)	.72230	0	19(6.2)	98(32.1)	163(53.4)	25(8.2)
5) Analysis and problem solving	2.61	2.29 (Low)	.62046	0	9(3.0)	89(29.2)	189(62.0)	18(5.9)
6) Application, improvement and technical development	2.61	2.38 (Low)	.69329	0	22(7.2)	88(28.9)	180(59.0)	4(4.9)
7) Able to use computer programming command	2.61	2.36 (Low)	.75229	0	25(8.2)	85(27.9)	169(55.4)	26(8.5)
		2.32 (Low)						

Table 4.19 Competences of labor in bachelor's degree (cont.)

Details	Levels of competences		Frequency/(Percentage)					N=305
	standard score	Mean	SD	5	4	3	2	1
Knowledge of quality inspection								
1) Engine system	2.61	2.48 (Low)	.69317	0	14(4.6)	138(45.2)	132(43.3)	21(6.9)
2) Sound engine inspection	2.61	1.95 (Low)	.47765	0	2(0.7)	22(7.2)	241(79.0)	40(13.1)
3) Detecting malfunction from assembly and deciding to deal with malfunction	2.61	2.40 (Low)	.65242	0	3(1.0)	142(46.6)	135(44.3)	25(8.2)
4) Able to conduct the basic inspection tools	2.61	2.75 (Moderate)	.66283	1(0.3)	24(7.9)	188(61.6)	81(26.6)	11(3.6)
5) Analysis and problem solving	2.61	2.28 (Low)	.58857	0	5(1.6)	92(30.2)	191(62.6)	17(5.6)
6) Application, improvement and technical development	2.61	2.43 (Low)	.61967	0	13(4.3)	113(37.0)	171(56.1)	8(2.6)
		2.38 (Low)						
Knowledge of Maintenance and Applicable								
1) Knowledge to operate on themselves	2.61	2.35 (Low)	.61629	0	4(1.3)	118(38.7)	164(53.8)	19(6.2)
2) Able to use foreign languages related to general job	2.61	2.34 (Low)	1.79258	1(0.3)	7(2.3)	73(23.9)	212(69.5)	12(3.9)

Table 4.19 Competences of labor in bachelor's degree (cont.)

Details	Levels of competences		Frequency/(Percentage)					N=305
	standard score	Mean	SD	5	4	3	2	1
3) Able to use foreign languages related to technical job	2.61	2.30 (Low)	.56032	0	11(3.6)	73(23.9)	216(70.8)	5(1.6)
4) Able to maintenance machine, Tools and equipment	2.61	2.31 (Low)	.71124	1(0.3)	12(3.9)	98(32.1)	165(54.1)	29(9.5)
5) Able to maintenance robot	2.61	2.21 (Low)	.69573	0	8(0.7)	89(29.2)	168(55.1)	40(13.1)
6) Analysis and problem solving of maintenance machine, tool and robot	2.61	2.69 (Moderate)	.57184	0	8(2.6)	203(66.6)	85(27.9)	9(3.0)
7) Able to bring knowledge of engineering and technology to apply their job	2.61	2.81 (Moderate)	.68429	2(0.7)	34(11.1)	182(59.7)	79(25.9)	8(2.6)
8) Able to control the machine by using the computer	2.61	2.74 (Moderate)	.69067	2(0.7)	27(8.9)	175(57.4)	91(29.8)	10(3.3)
9) Able to control the automotive electrical system	2.61	2.49 (Low)	.70753	2(0.7)	15(4.9)	129(42.3)	142(46.6)	17(5.6)
10) Able to make a production planning	2.61	2.63 (Moderate)	.60532	1(0.3)	4(1.3)	193(63.3)	94(30.8)	13(4.3)
11) Able to evaluate and solve problems in case of the complex level	2.61	2.27 (Low)	.59591	1(0.3)	2(0.7)	94(30.8)	189(62.0)	19(6.2)
12) knowledge and skills to work in industry 4.0 or future technology	2.61	2.26 (Low)	.59884	1(0.3)	6(2.0)	81(26.6)	201(65.9)	16(5.2)
		2.45 (Low)						

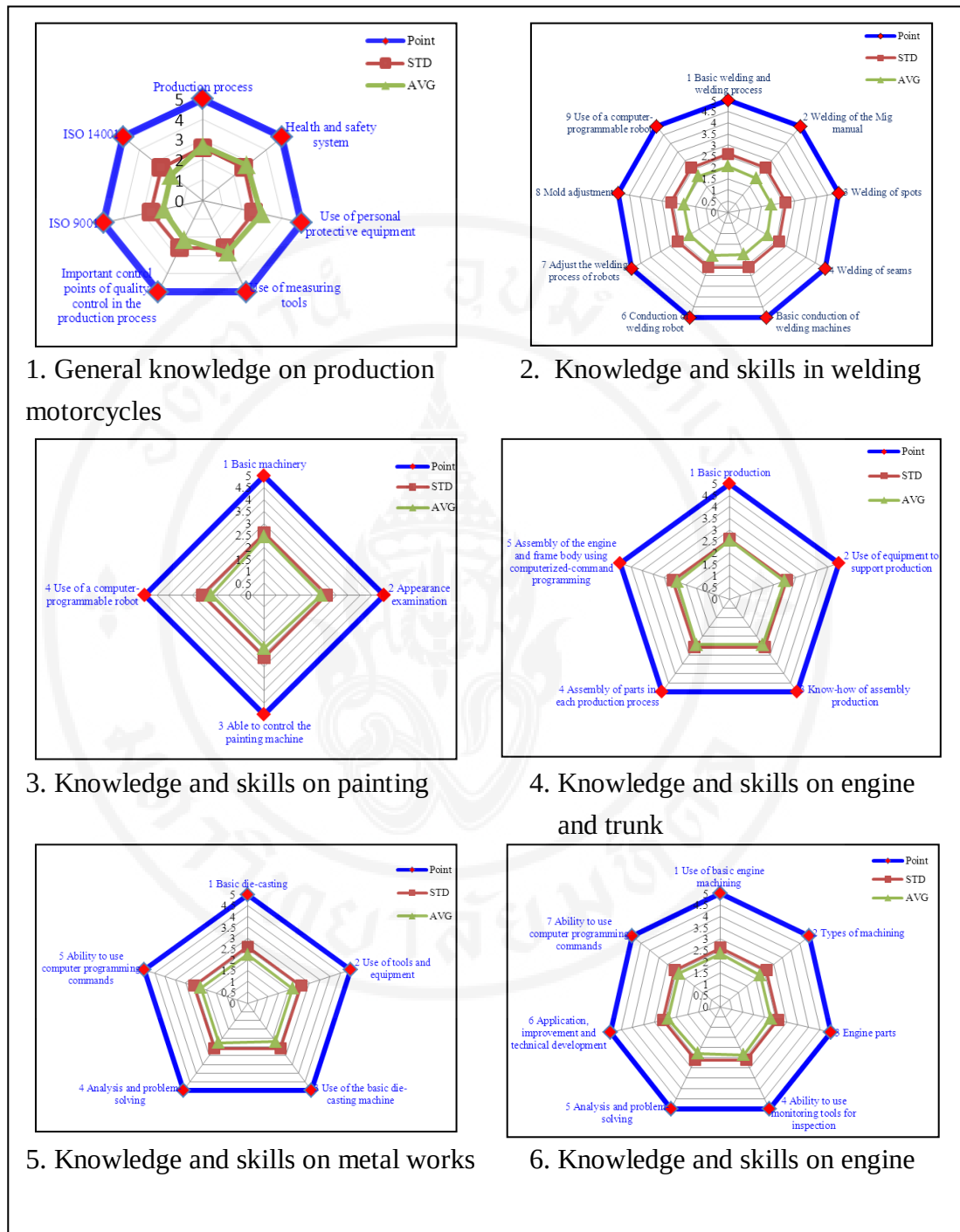


Figure 4.7 Represents the competences of labor in bachelor's degree

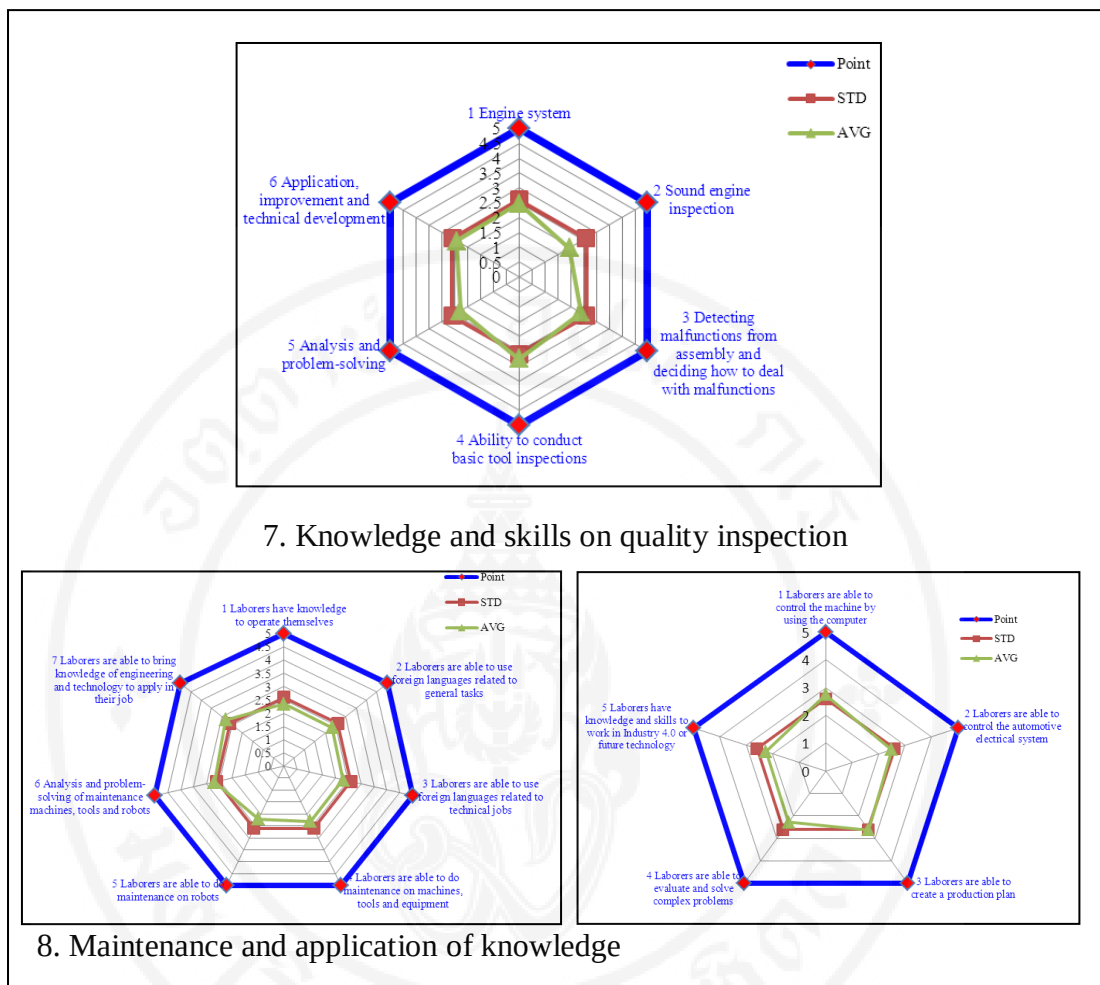


Figure 4.7 Represents the competences of labor in bachelor's degree (cont.)

Based on the results of the assessment of the labor skills in the vocational and bachelor levels found that the theoretical course is focused rather than the practical course. Another cause is the standard of every education institution, including the government and private sector was still lacking in equal standards. Meanwhile, the training curriculum of the Department of Skill Development was currently unable to perform due to the manufacturing had more advanced knowledge and skill development system than the Department of Labor Skill Development. Therefore, the government's course has been modified as a short-term course but it did not attract much attention from the private sector. In addition, the clientele of the Department of Labor Skill Development came from the students, Graduate students. Most of them will not come to attend this program because they will go to work and

receive directly training from the manufacturer. There will only be trainees who want to work with small businesses. Furthermore, the Department of Labor Skill Development has no standard covering every professional qualification in the industry. Therefore, the development of the education system for cooperation in manpower preparation and labor productivity development can be summarized as shown in Figure 4.8.

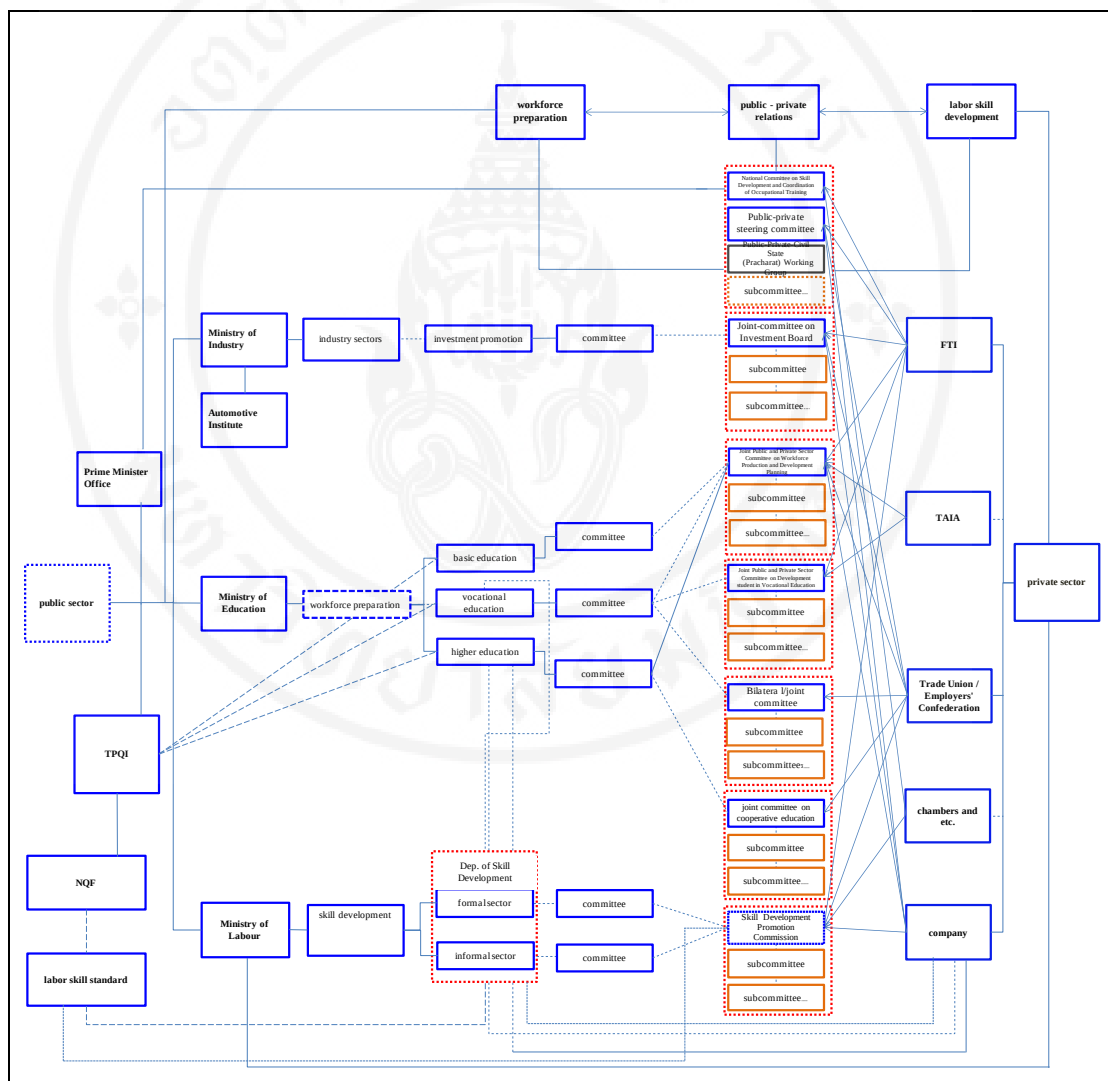


Figure 4.8 Represents the relationship of public sector, private sector, and cooperative between public and private sectors in preparing the workforce and the development of labor efficiency

From Figure 4.8, the current model of manpower preparation and development of labor efficiency in the automotive industry can be classified into two types of education management, with six types of committees, with five sub-committees and four activities/projects. The results of the study found that the manpower preparation and development of labor efficiency the automotive industry had three main government agencies: the Ministry of Education, Ministry of Labour and the Ministry of Industry. Each ministry will have its own departments responsible for manpower preparation and development of labor efficiency based on roles and missions. While, the private sector was participates and organizes cooperation with the government as a council/association. The relationship and the role in the operation found that it was established many committees, including subcommittees for specific functions. The model of cooperation was bilateral, tripartite and multilateral. This result is found that the problem was occurred with the coordination, cooperation and efficiency of each government agencies. Therefore, it was affected to the labor skill and in accordance with the industry needed.

Therefore, the review of cooperation between the government and private sectors is focused on the development of labor efficiency and the effectiveness of cooperation. This study aims to offer to reduce duplication, increase performance and quality of workforce and meets the industry needed.

CHAPTER V

DISCUSSION

This research has studied manpower preparation and labor development in the motorcycle industry of Thailand. The process of researching has studied the cooperation between internal government agencies, the private sector and the private sector, as well as between the government and the private sector. It has also focused on the development of education curriculum from the Ministry of Education, development of labor skills from the Ministry of Labour together with the Ministry of Industry, as well as cooperation with the private sector continuously. In addition, this research reflects policy implementation and cooperation between the public-private sectors to improve labor efficiency in the motorcycle industry of Thailand, including the appropriateness of future policies and models. This research focused on answering the questions by the following items:

1. Is the curriculum of the institute for education consistent with the labor demands of the motorcycle manufacturing industry in Thailand? How? (The results of the study were in accordance with Objectives 1 and 2.)
2. Did the government and the private sector in the motorcycle industry of Thailand cooperate in preparing manpower for the motorcycle industry? What were the problems of cooperation? (The results of the study were in accordance with Objective 2.)
3. How did the model and activities of public-private partnerships improve labor efficiency in the motorcycle industry? Did it affect the performance of labor in the motorcycle industry? What were the problems of cooperation? (The results of the study were in accordance with Objective 2.)
4. What kind of future appropriate model was in the motorcycle industry of Thailand? What was the reason? (The results of the study were in accordance with Objective 3.)

Three research objectives were identified by the following:

1. To study the progress of educational policies and programs for knowledge and skills before entering the motorcycle manufacturing industry in Thailand.
2. To study the circumstances and problems of cooperation between the public and private sectors in providing workforces for the industry as well as the development of labor productivity in motorcycle manufacturing in Thailand.
3. To develop policies and public administration in terms of providing effective workforces for the industry as well as a collaborative model for the public and private sectors in the motorcycle industry for the future.

The study can be divided into three parts: 1) Assessing the development of educational management policies and the provision of educational programs to educate and provide skills for manpower before entering the industry. 2) Examining the current problems of manpower and development for labor efficiency in the motorcycle industry of Thailand. 3) The development of progress for cooperation between the public and private sectors.

This chapter discusses two issues: 1) The results of the study 2) Government policies and the administration of manpower preparation for the industry, labor productivity development and a cooperation model for the future.

5.1 Discuss the findings of the study

Based on research hypotheses 1–3, public-private partnerships were not yet able to improve labor efficiency in accordance with the private sector's demand in the motorcycle industry in the following areas:

1. Education should prepare manpower for the motorcycle industry, but there is a lack of appropriate management cooperation between the public and private sectors. As a result, the knowledge and skills of the workforce do not match the motorcycle manufacturers' requirements. This is impacted by the following aspects:

- 1.1 The industry has a shortage of skilled laborers.

- 1.2 Preparation and workforce development in the country has been slow to catch up with the growth of the motorcycle industry, partly due to the lack of quality in cooperation between the public and private sectors.

2. Public policy and public administration to provide the development of workforce skills have not been able to provide the consistency in knowledge and skills required by motorcycle manufacturers.

3. From the past to the present, the management of cooperation between public and public, private and private, and public and private sectors to provide workforces for the motorcycle industry has not been properly formatted and needs to modify to a new management style in order to guarantee the availability of labor performance in the motorcycle industry.

Based on the results regarding the tested assumptions of research hypotheses 1–3, it was hypothesized that public-private partnerships could not improve labor efficiency in accordance with private sector demands in the motorcycle manufacturing industry of Thailand. Due to unsuitable cooperation of public-private partnerships in the motorcycle industry, knowledge and labor skills affected the motorcycle manufacturer's requirements. As a result, the motorcycle industry sector experienced a shortage in skilled labor. Most of the labor force performance was below standard. In addition, the preparation and development of manpower in the country is delaying the growth of the motorcycle manufacturing industry due to unqualified cooperation between the public and private sectors, especially in the education and training system. The results of research following assumptions 1–3 can be discussed as below.

5.1.1 Development of educational management policies and educational curriculum to build knowledge and skills of manpower before entering the industry

The development of educational management and educational reform under the National Education Act BE 2542 (1999) involved a national education plan. It was the principle plan to develop manpower and performance. Government agencies involved in education and manpower preparation have applied the principles of the plan to set up the direction of curriculum together with the National Economic and Social Development Plan. In the early stages of development, the government needed to provide literacy skills and thorough basic education to Thai people. Later, it was developed to serve occupations such as handicrafts and a foundation for

vocational development, along with the growth of higher education in university. From Table 4.1, it is shown that each National Economic and Social Development Plan determined the direction of education development and human resources development as well as labor development in accordance with motorcycle manufacturing needs. Moreover, it also set the country's development plan direction over a 5-year period.

However, the implementation of these three developmental guidelines from the National Economic and Social Development Plan has been developed as a policy. The results still did not cover such laws and regulations always changed. Some policies or directions were outdated.

After the National Education Act BE 2542 (1999) reform and the National Education Plan BE 2545-2559 (2002-2016) was established, the 15-year strategic plan was created. The first plan covered three National Economic and Social Development Plans, which is related to Nos. 9, 10 and 11. Therefore, vocational education was reformed. In this case, the private sector has participation in education curriculum and emphasizes the actual practice of manufacturing for students. Higher education in university has piloted a cooperative education project that allows learners to perform and actually practice in manufacturing.

In addition, a major change in the government's policy in terms of manpower preparation and improvement of labor productivity in the automotive industry by the government provided the vision of "Automotive Production Based in Asia or the Detroit of Asia". At that time, internal government agencies involved in human resources preparation did not develop extensive automotive-related courses. Operations and planning at the time were done at the Ministry of Industry. The government assigned the Thailand Automotive Institute (TAI) to study and prepare the first master plan for the automotive industry in year BE 2545(2002). The project ran from BE 2547-2553 (2004-2010). The master plan proposed 13 projects for the development of the automotive industry. Most projects were carried out in cooperation with various internal-external government agencies under the Ministry of Industry. By then, they had already established the Automotive Strategic Committee. An important plan provided capacity-building programs, including engineering projects (undergraduate), engineering (vocational) projects, and skills development

labor projects (Department of Skills Development). The development of cooperation within the industrial sector became tangible at that moment. They have both supported the education curriculum and budget as well as providing advice and assistance in setting up relevant laboratories and research laboratories. Meanwhile, the Ministry of Labour, under the Department of Skills Development, has endeavored to promote the establishment of the AHRDA, the National Committee on Workforce Development and Vocational Training The National Committee (HRC), which has a Subcommittee on Strategic Development for Labor Force Development in the automotive and parts manufacturing industries coupled with the supervision of AHRDA. The committee involved cooperation between the government and private sectors. The 2009 AHRDA was established as a training institution for trainers and a role-playing field for vocational students participating in the pilot program. Bilateral Education in Automotive Parts Manufacturing was run by a subcommittee in the public and private sectors to produce and develop vocational training. The committee involved cooperation between the government and private sector. In this cooperation, the private sector has managed policy curriculum and provided manpower information, while the government sector has to provide equipment, facilities, budget and trainers under the Skills Development Promotion Committee.

From this development, it was evident that the public and private sectors have developed a mutually-reinforcing relationship in the education of manpower and the development of labor efficiency, as stated: 1) A bilateral study was organized in vocational education institutes from 1984 to the present and cooperative education in higher education. 2) It established cooperation between the government and private sectors, such as strategic manpower preparation and human development plan committee, the vocational institute development manpower committee and others. Most of them supported the public-private steering committee, which is consisted of Government-Private and Society. 3) Labor productivity development cooperation, the National Labor and Employment Development Council was set up to develop a strategic framework for developing labor forces in the automotive and parts manufacturing sub-committee in BE 2556 (2013). They also established the Human Resources Development Association and Public-private Steering Committee, which consisted of Government-Private and Society with the responsibility of improving professional qualifications.

In addition to the above, there were also working groups or committees established under bilateral, tripartite or multilateral cooperation between internal government agencies, the government and private sectors, and public, private and educational institutions such as the Skills Development Council for vocational students to enter the labor market. The Office of the Vocational Education Commission in the Ministry of Education cooperated with the Department of Skills Development in the Ministry of Labour. Furthermore, there was also cooperation between the Ministry of Industry, Ministry of Education, Ministry of Labour, National Statistical Office and the Federation of Thai Industries to create the LEED-X Labor Database System.

Most of the policies and processes took time due to law enforcement by various committees and sub-committees, as shown in the analysis in Table 4.5.

The form, structure and function of the board were established by: 1) Cabinet resolution; 2) Government plan/policy; and 3) Legal provisions. Many boards are appointed by their respective committees from the public and private sectors.

The result was the duplication of mission and discontinuity in performance when changing or relocating positions in government agencies and private professional organizations, which act as agents for individual establishments. The organizations will send delegates to take part as members or directors of each committee. Involvement made it unclear whether or not other private sectors in the industry could gain access to such engagement? In addition, established committees also have subcommittees or sub-committees established to act as actual practitioners under the guidance and oversight of the primary committee.

1. The form, structure and function of the board were established by: 1) Cabinet resolution; 2) Government plan/policy; and 3) Legal provisions. Many boards are appointed by their respective committees from the public and private sectors.

2. Relationships between government agencies and public and private sectors constantly integrate efforts and collaboration. However, there are still regulatory and regulatory conditions that are conducive to performance or the use of command/command approval/approval powerful decision-making. Delayed government procedures take a long time, including not having the same database or the same

information, but not the same storage. Each department stored different information and lacked integration and duplication. The Ministry of Industry hosted the Labor and Economic Data Exchange (LED-X) in conjunction with the Ministry of Labour and the Office of the Permanent Secretary for Labor, which were the first two agencies to cooperate to have the same database. Later, it expanded cooperation to the Ministry of Education, National Statistical Office and the Federation of Thai Industries. The system was renamed LEED-X + (Labor Economic and Education Data Exchange Plus), which was implemented under an MOU. However, the operation was halted in 2011 due to budget problems and the lack of technical staff to update new data, including hacker attacks. The site was shut down in 2013. All five units were re-introduced in 2015. The media stated that the project is operating year after year. It was not a continuous operation, either. It was up to the policy holder to approve the budget, including information partnerships and different definitions by the relevant agencies.

While the relationship between the government and the private sector involved the way of living, it also concerned the private sector for budget support, equipment and location. Afterwards, they developed participation by playing a role in the planning process and various courses.

3. Operations by policy makers, policy followers and policy leaders were discontinued, which was an important policy issue that affected policy followers' and policy leaders' operation. The changing of policy makers, agency leaders, government leaders or even private coordinators meant a lack of continuity. The case of the LEED-X Labor Database or the development of a national qualification framework with standardized labor standards was a lack of link in concrete practice.

4. Laws, regulations and rules from Table 4.5 develop policies in the form of rules, policies and plans. This was an important aspect of the government. If there were no laws, rules and regulations, then no action could be taken. Each rule and regulation applies and lasts for a long period of time. As a result, the need to develop or enforce, especially in the fast-changing automotive industry, was affected. In addition, different law enforcement resulted in joint committees overlapping.

5. Education was developed from a well-planned and well-structured study in the academic context. The private sector took a more active role in curriculum development, as well as training/apprenticeships. However, there was still

the problem of implementing the most effective labor-intensive conveyance to meet the needs of the industry. In addition to the development of the study, there was a hint of the curriculum in labor development among government agencies that had not played a major role in manpower preparation or labor development. This reflected a lack of policy integration and collaboration. This may be due to a policy that did not meet the true primary responsibility.

5.1.2 Situation and problems in human resource preparation and labor productivity development in the motorcycle manufacturing industry of Thailand

From developmental studies, in-depth interviews, and data collection from human resources staff, chief officials control production and quality to assess skills and labor efficiency in the motorcycle manufacturing industry by graduates of vocational education (Vocational/Diploma) and undergraduates. The results of the labor force evaluation mentioned above were supported and reflected the current effects of human resource development and labor productivity development. It found the following items:

- 1) The current situation of cooperation has continued to face concrete and ongoing operational problems due to a lack of planning and direction for manpower development in order to support industrial development. Although there was a goal of creating a “Detroit of Asia”, manpower preparation and labor development has failed to address the changing industrial development policy in the country. One reason was that the country did not have a clear direction for the industry’s policy. The government has only focused on foreign investment.

The government policy was discontinued and clarified due to policy changes, including political interference and overlapping interests with some private entrepreneurs. It made the person who was responsible for implementation of the policy unable to execute it, particularly concerning the complexity of governmental management structures and law enforcement between the public and private sectors. Therefore, the private sector was without confidence and unable to prepare, such as improving production technology or budget investment. Furthermore, the government sector did not have the investment promotion to strengthen automotive innovation,

especially for Thai investors, academics or experts, to operate independently but mainly for dependence on foreign innovation. Therefore, Thailand was not able to have its own core industries and innovation could not be achieved. Moreover, determining a road map for education and industry in accordance with human resources in the country was very important so that the government could not analyze or process performance evaluation in the country to pursue its features.

In addition to government policies and management in terms of the cooperation of committees between government and private sectors, the private sector itself, either individually or in enterprises, was still unclear about providing information to the public sector due to competitiveness and business secrets. This included shared attitudes among public and private sectors, which had different ideas. Therefore, it was difficult to be successful.

In terms of cooperation, the private sector considered that the best effort is to prepare manpower for a bilateral education system. However, there were still problems with data communications and the administration of benefits for being a part of the development and training of manpower or providing internship services to trainees held in the manufacturing under certain investment-related expenses such as trainers, materials used in practice and others. In addition, the development of education curriculum by the Ministry of Education's agencies was still ineffective in jointly developing curricula to keep up with technological change. While the professional qualification standards set by the Ministry of Labour could not accommodate the true capabilities of the workforce, they just set out to recheck only the employment standards.

2) The policy and management of the public sector was still constantly lacking and did not relate to the private sector's labor demands. The government defined the policy without understanding the basic and real needs of the industrial sector. While the industry did not provide factual information that should inform them, policy makers had defined road maps. Manpower preparation was unclear and in line with needs. In addition, policy formulation and the implementation of policies into action plans involved different people. Work plans also lacked continuity and common standards. Each government agency's work was lacking in integrated collaboration and links to national policies. Further, the National Economic and

Social Development Plan could not be implemented completely from past years. Besides, there was no clear responsibility by government agencies for the direction of the government. This caused ineffective management of difficult work. The link and coordination of the public sector would be forwarded to relevant departments.

While public management of education and training continued to experience the problems of well-educated personnel, it was passed on to learners or trainers, both academics and the Department of Skill Development owing to insufficiency of practical work experience and inaccessibility to real work with modern automotive technology. Applying the theory to technical and business applications did not work as well. Neither did the lack of equipment and tools used in the training needing to be updated for technology. Automotive technology was a problem because there were self-employed entrepreneurs from different countries and companies. It was absolutely difficult for a government to choose a particular company's technology, as well as the format or technology for each organization, to be a secret of the organization. Thus, it was definitely impossible for the individual workforce to evolve capable or elevated skills. The formulation of individual development or manpower preparation was not consistent with the needs of the private sector.

3. The educational curriculum had been developed by academics that lacked real work experience. As well, the use of tools, machinery and technology changed rapidly. Most of them emphasized normal theory rather than practice. Thus, the involvement of the private sector in education was definitely essential and important for the following issues:

(1) Cooperative development of education curriculum from Table 4.6 and 4.7 showed that the provision of educational programs by providing students with practical training in the workplace improved their work skills and provided them with educational programs. It was necessary to the greatest extent possible. This reflects that the development of the curriculum affected the current workforce; the workers could not work immediately after graduation. Further, the curriculum was not modern enough to allow workers to work at the pace of technological change. In Table 4.12 and 4.13, the private sector was involved in low-level public education. Moreover, there was less participation in higher education than vocational education.

(2) Training by relevant government agencies was not sufficient, either in quality or quantity. According to the results in Table 4.10 and 4.11, private labor training, especially on-the-job training, meant the Human Resource Development (HRD) theory covered a wide range of topics to link personnel with the sector and business integration (Silva, 1997; OECD, 2006). JR Swan (2012) considered that human capital investment in training was the first step in human capital development. In addition, training was also a part of the skills development that each organization must follow under the law for promoting skills development. As shown in Table 4.6 and 4.7, workers need to have training in a vocational course for specific techniques from pre-employment establishments, without the need to send workers to government training. As in Table 4.10 and 4.11, this was consistent with the opinion of the Chief Production Control Officer and Quality Assurance Committee. Most needed vocational training from pre-vocational (vocational) and bachelor's degree programs, as shown in Table 4.16 and Table 4.18.

The industry believed that the government's training curriculum by the Department of Skills Development involved the private sector in contributing to the transfer of knowledge, technology, and supporting materials needed to produce training. Therefore, joint training courses between the public and private sectors were required to be carried out in accordance with Table 4.12 and 4.13.

(3) In addition to the need and necessity for the industry to participate in educational management, develop curriculum and training, there was also a joint effort to develop skills in the form of competitions, craftsmanship testing, skilled technicians training at the vocational and undergraduate level, and private sector participation. However, the results of participation in both the development of skilled labor were always up to date as well. The creation of knowledge and technology transfer was between the public and private sectors and skilled labor, which involved those studying at a high level, according to Table 4.14 and 4.15.

(4) Current labor efficiency, involving the assessment of labor capacity for all 8 types, concerns general knowledge about the production of motorcycles, welding, skills and spray painting, as well as skills in engine and chassis, engine lathe and skills in quality inspection and maintenance. These skills were applied to both vocational and bachelor's degrees, which have a lower standard level.

Based on the analysis of research data to determine consistency between labor capacity and industry needs, it was found that vocational education (Vocational/Diploma) had a minimal to moderate skill level. The minimum skill level involved general knowledge of motorcycle manufacturing, ISO 9001 and ISO 14001, including the job related to foreign languages, specialized technical work, production planning, evaluating and solving problems from a more complex level. Basic knowledge and skills supported the industry 4.0 or future technology as well.

At the bachelor's level, there was minimal to moderate skill level. The moderate skill level comprised general knowledge of the manufacturing processes for motorcycles, occupational health and safety, personal protective equipment measuring tools, knowledge and skills in quality inspection, initial inspection tools, control, analysis and problem solving, as well as engineering and technology knowledge for practical application, control of machinery by computer and production planning.

From the above, the provision of education courses to build knowledge and skills for labors was not exactly what the industry needed. As with the training curriculum provided by the Department of Skills Development in Table 4.8 and 4.9 in accordance with the research hypothesis item numbers 1–3, public-private partnerships have not yet been able to improve labor efficiency in accordance with private sector requirements in the motorcycle manufacturing industry of Thailand. The education management system for manpower preparation in the motorcycle industry was not properly managed in terms of cooperation between the government and private sectors. Therefore, the industry suffered from a shortage of skilled labor. Manpower preparation and the development of skills in the country were delayed when compared with the growth of the motorcycle manufacturing industry regarding unqualified cooperation. When considering the conceptual framework of the policy process by Paul A. Sabatier (2007), policymaking should involve the creation of a conceptual framework for solving problems and forwarding it to the government for revision. The government should determine countermeasures and bring them to practice together with evaluation and revision of the countermeasure properly. However, the current situation has many weak points such as the lack of processes driven by relevant agencies in the government. Moreover, the implementation of policies was a weakness for practitioners who did not

understand the measures that led to achievement on time or a lack of a serious policy evaluation process, as well as having a great sense of command over colleagues in the workplace. As a consequence, it was not possible to conclude whether policy effectiveness was successful.

Cooperation was the beginning of efforts to organize and coordinate mechanisms between the public and private sectors. An important approach was to encourage private sector institutions to play a greater role and contribute to the development of the country. When the time passed, the process did not show the result of improved government and private partnerships compared to industrial growth. The development of cooperation has originated from the establishment of joint government and private committees to promote trade and investment in the private sector within the country during General Prem Tinsulanonda's time as Prime Minister. It has consisted of Economic Ministers and the heads of relevant government agencies. The private sector was comprised of representatives from three institutes including the Chamber of Commerce of Thailand, the Federation of Thai Industries and the Thai Bankers' Association. This was an important implication of the development of cooperation and an advantage for the government sector that required expertise and resources from the private sector, especially in technology tools and equipment, including industry knowledge to develop education curriculum and labor development. At present, a committee has been set up to address the shortage of skilled labor and increase manpower preparation, called the Public-Private Steering Committee. The Committee is responsible for the Integration of Skills Development for Vocational Students to enter the labor market as well as bilateral, tripartite and multilateral cooperation between government agencies and other private sectors. It has encouraged development of a collaborative approach to promote the ability of nations to compete at the international level and show the country's position of wealth in resources. The aspects were ready to support foreign investment.

It was evident that the country had policy-making to support and resolve many problems. Many committees have similar objectives. On the other hand, it could not be integrated into the same committee that focused on the potential to develop the country. Therefore, the policy of cooperation from the past until now,

in terms of collaboration, could not be expressed in a concrete way. This problem may be due to the fact that the government has never surveyed private sector needs. Government committees were not following the policy and in-depth coordination with the private sector. Due to the reasons above, the private sector has become self-reliant to the present. However, the other facts, the researcher has considered that the private sector by the Federation of Industries or other institutions could not access the actual needs of manufacturers because the representatives of the private sector were not truly able to make decisions. Therefore, cooperation between the government and private sectors was not able to create a master policy, which reflected on the automotive industry as well. This is why the government and private officers were not paying serious attention. Therefore, it affected the direction of cooperation in the country. As for the results of this study, the researcher should consider reviewing the new model of cooperation in the near future by studying the concept of Muriel Dunbar (2013), who approached studying public-private partnerships (PPPs) that have been used to describe the nature of new partnerships. The partners of industry and academia were: Government case was responsible for driving human resources development. However, labor efficiency could not occur in a very short time if fewer benefits from the government were contributed or did not match private sector needs.

The results also have shown that government policies and the administration of human resource development and skills development were not able to enable workers to develop their knowledge or skills. Labor efficiency has met the needs of the motorcycle manufacturing industry, which was mainly due to the occurrence of policy. The policy makers change frequently, resulting in failure to pursue policy in accordance with the concept of policy continuity (Charles E. Linblom, 1959). Incrementalism was an important issue for policymakers to affect policy compliance, such as the LEED-X labor database system or the development of national qualifications frameworks and the standardization of labor skills, which lacked linkage in concrete practice. According to the Policy Network, the goal was achieved through collaboration (Sander Chan and Christina Müller, 2012). Collaboration was essential to achieve labor productivity and consistency between demand and manpower in the real industry sector. Especially when the government has a large organizational structure, it is complicated to execute policy. According to the concept

of Koliba (2012), the relationships between internal government agencies (Intergovernmental relations IGR) comprise Coordination, Coverage and Authority, while the relationship of the government and private sectors (Inter-organizational Relations: IOR) comprises many types such as Coordination, Cooperation, Collaboration, Competition and Conflict. Currently, the relationship between the public and private sectors has many models.

All of this has shown that government-to-government collaborative management, the private sector to private sector, and government to private sector manpower preparation of the motorcycle industry, from the past until now, were not in the proper model. It should have a new management model for the motorcycle manufacturing industry. According to a study by Louis Soares (2010), it provided the definition of community-to-industry partnerships in the education sector that it was a type of collaboration between a community college and a particular business group, Chamber of Commerce, business association or sector, with the aim of sharing resources and creating alternative education courses linked to economic development. The region and labor force needs both new entrants and those looking to develop skills and education. The partnership can help with human resources, finance, facilities, materials, equipment and leadership in various areas of purpose. However, cooperation between the government and private sectors in the motorcycle industry are currently in a modest, intermittent, degrading and resource-intensive relationship. In addition, Soares also proposed that the best practice of a partnership was between a community college and an industry. The research was compared with the situation between government and private cooperation in order to find which approach would be successful. The partnership must be focused on implementing the policy seriously by the following:

(1) Curriculum and instructional transformation: Partners can create new curricula and teaching materials, including curriculum content and lessons. The curriculum is based on skills, faster completion, and learning from the real workplace. The employer will play a role in developing and certifying the curriculum.

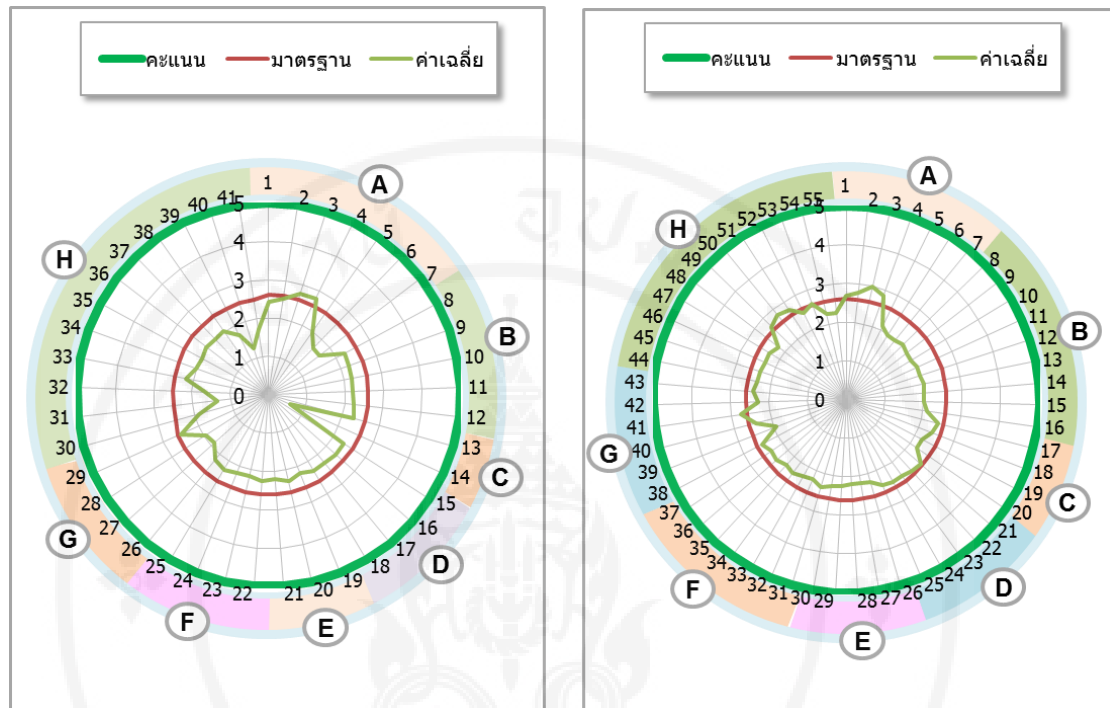
(2) Academic and social support: Partners can provide academic support and job placement for their students. This includes the creation of a small learning resource or financial support to employment centers providing financial assistance advice, including academic and professional counseling.

(3) Professional Development: Partners can provide resources to community college instructors to develop the skills needed and create new curriculum, both fundamental academic and professional academic, as well as track the progress of the learner and the needs of the employer.

(4) Shared resources for sustainability: The partnership helps to create a newly-developed education program as well as a partnership by setting the level of leader in partner involvement, such as investment in facilities and equipment.

(5) Systemic Institutional Alignment and Improvement: Partners can play a role in changing vision, strategic planning and college resource management.

These good practices are essential to establishing the basis of cooperation and can be adapted to the current situation in the country. Based on Muriel Dunbar (2013), study, industry and educational partnerships can be linked to the level of joint development strategy and joint activities such as career standards, training institutes and the development of training courses. At present, most state-level national forums are the main driving force. However, voluntary cooperation from the private sector was quite minimal due to the loss of benefits. Therefore, the policy target could not be achieved within a short period. According to Stephen Palmer and David J Torgerson (1999), the best way for collaboration to maximize performance must include technical efficiency, productive efficiency and allocative efficiency. Technical efficiency uses resources that yield the most technical, engineering or scientific benefits for the production process. Productive efficiency is the choice of different resources which are combined to produce the maximum output for the lower cost. Allocative efficiency is the integration of all available resources in the community to maximize benefits. While the private sector has the knowledge and skills, the expertise in automotive technology, equipment and materials as well as advanced testing laboratory, can use resource integration and systematic management for the benefit of both parties under a public-private partnership model.

Vocational and Diploma Level**Undergraduate Level**

A = General knowledge about motorcycle production

B = Welding knowledge and skills

C = Painting knowledge and skills

D = Engine and frame body knowledge and skills

E = Die casting knowledge and skills

F = Machining knowledge and skills

G = Quality knowledge and skills

H = Maintenance and application of knowledge and skills

Figure 5.1 Skill level in vocational training (vocational/diploma) and at undergraduate level

In addition to the relationship between organizations is the type of cooperation between governments, private educational institutions and others. It is very important for the effectiveness of cooperation and the expected results. A collaborative study of manpower preparation and current labor productivity development based on co-operative and theory concepts can be summarized in Table 5.1

Table 5.1 Summarize collaborative patterns and performances

Projects/Committees	Types of Interaction				Types of Cooperation			Results	
	Coordination	Cooperation	Collaboration	Conflict	Triple Helix	Public Private Partnership (PPP)	Labor efficiency	Cooperation efficiency	Consistent to the demand from the industry Sector
Dual Education System (School-Factory based Education Project)	○	○	○	○			☐	☐	☐
Dual Vocational System	○	○	○	○			☐	☐	☐
Dual Vocational Education System Reform	○	○	○	○			☐	☐	☐
Dual Education System	○	○	○	○			☐	☐	☐
Cooperative Education	○	○	○	○	○		☐	☐	☐
Subcommittee on Promotion and Development of Work-integrated Learning (WIL) Education		○	○		○		☐	☐	☐
Joint Public and Private Sector Committee on Workforce Production and Development Planning			○				☐	☐	☐

Table 5.1 Summarize collaborative patterns and performances (cont.)

Projects/Committees	Types of Interaction				Types of Cooperation			Results	
	Coordination	Cooperation	Collaboration	Conflict	Triple Helix	Public Private Partnership (PPP)	Labor efficiency	Cooperation efficiency	Consistent to the demand from the industry Sector
Joint Public and Private Sector Committee on Development student in Vocational Education		○					☞	☞	☞
Joint Public and Private Sector Subcommittee on Development student in Vocational Education		○					☞	☞	☞
National Committee on Skill Development and Coordination of Occupational Training	○						☞	☞	☞
Subcommittee on Strategic Framework Development of Labor Force in Automotive and Auto Parts Industries	○	○					☞	☞	☞
Automotive Human Resources Development Academy (AHRDA)		○					☞	☞	☞

Table 5.1 Summarize collaborative patterns and performances (cont.)

Projects/Committees	Types of Interaction				Types of Cooperation			Results		
	Coordination	Cooperation	Collaboration	Competition	Conflict	Triple Helix	Public Private Partnership (PPP)	Labor efficiency	Cooperation efficiency	Consistent to the demand from the industry Sector
Public-private steering committee										
Public-Private-Civil State (Pracharat) Working Group on Basic Education and Leaderships		○	○	○	○			n/a	👉	n/a
Working Group on Competitive Workforce		○	○	○	○			n/a	👉	n/a
Skill Development Promotion Commission	○							👉	👉	👉
Committee on Skill Development Integrated to Vocational Students for Labor Market	○							👉	👉	👉
LEED-X System		○	○	○	○				👉	👉
Skills Competitions/ Skills Tests			○	○		○		👉	👉	👉

Table 5.1 Summarize collaborative patterns and performances (cont.)

	Types of Interaction				Types of Cooperation			Results	
	Coordination	Cooperation	Collaboration	Competition	Conflict	Triple Helix	Public Private Partnership (PPP)	Labor efficiency	Cooperation efficiency
Projects/Committees									Consistent to the demand from the industry Sector
Joint Curriculum Development	○	○				○		●	●
Joint Training Courses		○						●	●

● 25% result ● 50% result ● 75% result ● 100% result

Analyzed base on the study founds and evaluated by researcher

5.2 Government policy and the administration of manpower preparation involve the industry and development of labor efficiency. Appropriate cooperation between the government and private sectors in the motorcycle industry of Thailand benefits the future.

Based on research hypothesis 4, the government and private partnerships have not yet been able to improve labor efficiency in accordance with the private sector's demands in the motorcycle industry of Thailand. In case of cooperation desirable in the future, it will promote success in manpower preparation to match the needs of the motorcycle industry. Further, development of labor efficiency in the motorcycle industry to be effective must be done by promoting cooperation between the government and private sectors in terms of networking. The new model is an institute that can perform the qualities of government and private partnerships following agreement with each other.

Manpower preparation should begin by identifying the government organizations that are directly responsible for promoting internal government collaboration as well as providing a coordinated and clear direction together with sharing the same database. It also expands cooperation to the private sector for development policies in accordance with the real needs of the industry. According to the concept of Gary Becker, who received the Nobel Laureate in 1992 for Human Capital Management, it is important to treat employees appropriately. The results of human capital management consist of the following:

- (1) Professional Development
- (2) Equitable and Fair Treatment
- (3) Stretch Goal and Empowerment
- (4) Creativity

In addition to the aforementioned, the government should have a policy to encourage young people to learn more vocational skills, collaborate with organizations to provide scholarships and exercise the right to work or internship abroad.

In terms of curriculum development, it should provide more practice and multi skills courses to enhance self-learning. The curriculum should be adjusted to reflect the needs of the industry and use the same standards as other educational

institutions. Based on the concept of PPPs and Triple Helix Model collaboration to enhance innovation, it is consisted of all three institutions: public, private and educational institutions. The educational institutions will be mainly responsible for curriculum development, including focus on labor skills development, which is designed to minimize the training.

For the Department of Skills Development, improving Skill Standards should be integrated and continuous in every section, exploring the needs of the private sector every year to provide current information. It should also be comparable to international standards to enhance competitiveness.

In addition, joint investment between the government and private sectors provides labs or joint operations with high technology equipment to develop the potential of learners and technological systems as well as educational institutions to set up joint research and development units. The government also supports investment in order to develop the education system and production innovation in the future.

All of these can be set up as cooperation committees by the following:

(1) The National Policy Committee, together with the private sector, is to determine the direction of the national education system to the same curriculum standards across the country and in accordance with the direction of the industry. (2) The National Research and Innovation Development Committee is responsible for developing co-innovation or (3) The establishment of an organization or institution consisting of government which relevant internal government under the Ministry of Education, Ministry of Labour and Ministry of Industry. The private sector is consisted of highly-qualified technical and management talent from the motorcycle manufacturer. Meanwhile, academics possess knowledge of motorcycles. Domestic investor groups serve the roadmap and plan to develop the motorcycle industry in the country. Most cooperation is reported directly to the government leader. This is the pattern most participants agree on. Further, this type of collaboration is consistent with the partnership model, which is in accordance with Peter V. Schaeffer and Scott Loveridge (2001). Thus, the private sector will take part in strategic planning and participate in human resource partnerships, budgets, equipment, and technical services (Dunbar, 2013; Soares, 2010, Tansen, 2012). Furthermore, the private sector will participate in the National Quality Development and Certification Process, including

quality control and certification training institutions to reduce inconsistencies between the labor market with vocational education programs (Labor Production) (Musharraf Hossain Tansen, 2012).

For guidance on how to address the issue of public-private partnerships, the researcher considers that it should be established as a Public-Private partnership between the public and private sectors and incorporates some of the Triple Helix Model, with the participation of academics and experts who specialize in the motorcycle industry. In addition, the government will serve as the backbone of the establishment for the National Institute for Developmental Education and Research, with the Prime Minister presiding over the initial changes, as appropriate. It is driven by a partnership between the government and private sector, as shown in Figure 5.2, with the following actions:

1. The private sector will play a major role in the structure of human resource development, as the private sector is aware of the need for technology better than the public sector. It will also incorporate collaboration with academics and experts to develop curriculum and recruit talented individuals, according to Alfonso Arellano et al. (2008), who studied Public-Private Partnerships in Labor Markets. It proposed collaboration between the private and public sectors to achieve specific goals. In the context of the labor market, it was found to still be very low. Therefore, the implementation of joint public-private partnerships in the vocational and continuing education sector at the undergraduate level is very important. Therefore, the curriculum development by the institute /organization will address the problem of curriculum development that does not meet the same standards and quality. In addition, the right recruiting experts will help to solve the problem of inexperienced trainers. As a result, learners or trainees will learn the actual workplace and high technology that is happening at that moment. This cooperation between public and private sectors will support the manufacturer to reduce the training program for new vocational/diploma and undergraduate in order to work completely in manufacturing.

2. Strengthening the roles and responsibilities of the committee: From the current situation, it was found that the committee was still attached to a government agency. In order to be flexible, the role must be defined as an independent working process that can be determined by the new institution. The role assignment must be

clearly separated from other government agencies, but still have the best connection between each other. For example, the committee's role should be to promote the new institute and develop curricula education to support the growth of the domestic industry as well as compete internationally. Based on the concept of Thomas R Dye (2013), especially for the evaluation of performance and improved unsuccessful jobs, human resources development in the country is included. Moreover, the concept of "Social Capital-Networking" by Professor Dr. Chira Hongladarom is leading human resource management to adapt labor development skills such as human capital, intellectual capital, ethics capital, happiness capital, social capital, sustainability information, and technology capital, which enhance the experience of human development in the country. The benefits of this cooperation will be reduced duplication problems for each committee, decision making, and delayed operation, among others.

3. Strengthening relevant laws and regulations: This is a problem that occurs in internal government agencies that needs to be resolved. Thus, the researcher found that special laws must be applied to establish the new institution.

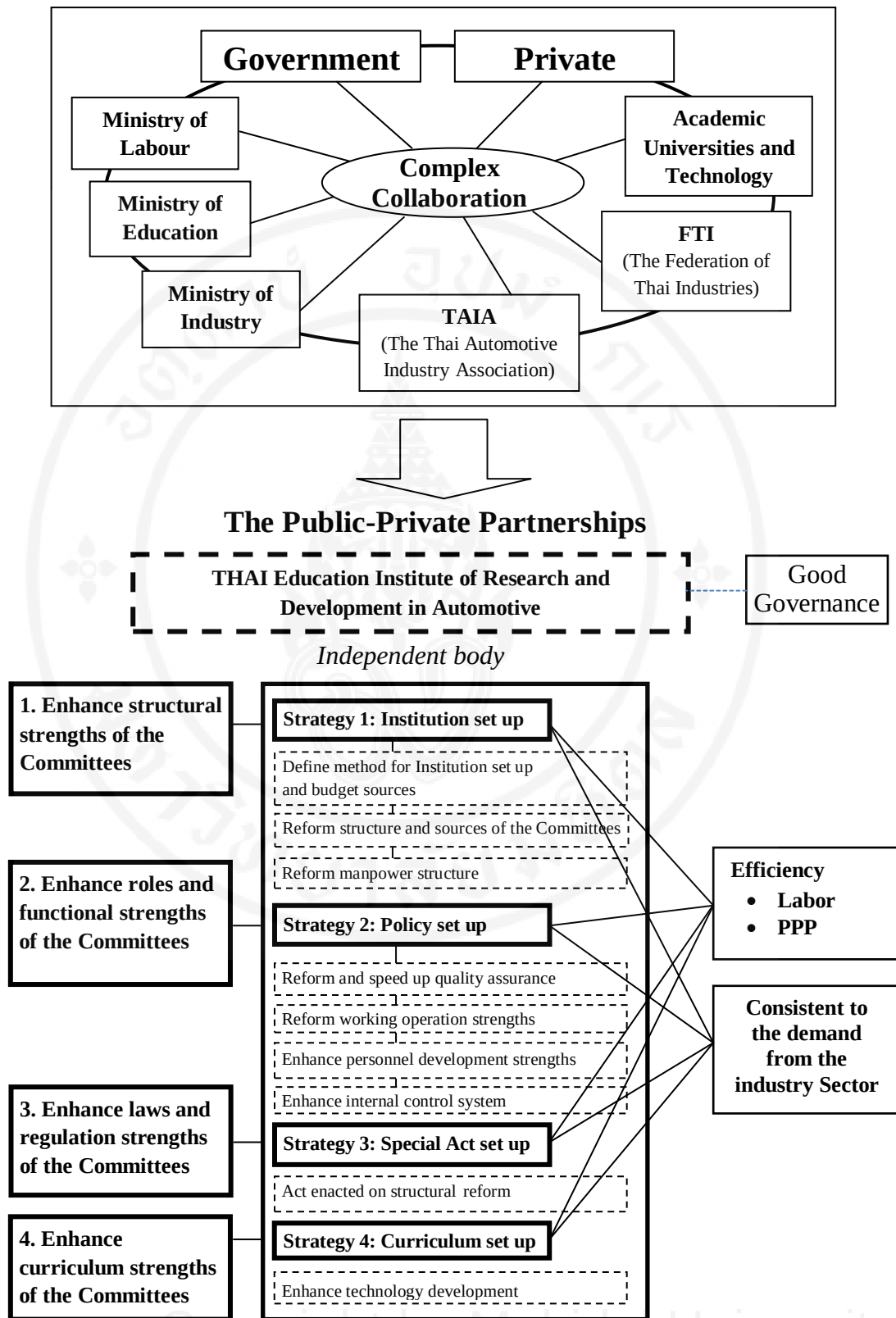


Figure 5.2 A new model for public private partnership (PPP) in manpower preparation and labor skills development

4. Strengthening the education curriculum: The researchers found that the pattern of labor force development was based on the concept of Public Private Partnerships: Lessons Learned of USAID (2009). The key factor that strengthens and articulates intellectual competency for labor is the private sector, which must play an increasingly active role, including for technology, management and research-development. Most of the private sector is the initiator of business and economic development projects in the country. It is essential for the private sector to take part in the transfer of knowledge innovation to labor through the cooperation and co-management of both parties. Therefore, the framework of the education curriculum means the government must support and listen to proposals from the private sector, including the preparation of the zoning system along with the industrial system in the country. This will provide the government with information that can be analyzed to fully use human resources development planning and manpower preparation. A road map for human preparedness will lead to further development of curriculum, education and training in the future as well.

From the above ideas, the institute is set up to address long-term issues. For this reason, the researcher did not elaborate on budget, appropriate workplace or recruitment. Recommendations were only made when concrete arrangements were present. It is the right and duty of the Board of Directors to continue in the future.

CHAPTER VI

CONCLUSION AND RECOMMENDATION

6.1 Conclusions of the study

The public-private partnerships are the one of the new management models to improve the New Public Management (NPM), which has the significant principle of cooperation between the government and private sector. This model is to develop public services such as health, education, labor, and research and development which are to support the economic growth of the country. For skills development, many countries have plans to engage the business sector in developing management strategies and designing skills development systems in partnership with the government sector in order to share resources and to link education and economic development and labor demand together. The private sector can be involved in a variety of ways, such as human resources, finance, facilities, materials, equipment, and management. Moreover, the private sector can provide training and coaching skills to transfer knowledge and opportunities for students, both formally and informally. In Thailand's situation, the private sector is participating in education and labor development continuously. It has also been promoted from the past until now in accordance with the National Economic and Social Development Plan. In addition, the significant starting point for private sector involvement is the emergence of jointing between the government and private committees. The aim is for specific economic development and also the development of a variety of cooperation under the same principles and practices, such as education, technology and research and development etc.

Regarding public-private partnerships in the automotive industry, they are developed by following the government's policy of 2002 to become the automotive manufacturing base in Asia or the "Detroit of Asia" by 2011. At that time, the automotive industry was the major part, or 1/5, of the core industry in Thailand which is focused on by the government. Therefore, the government has developed 2 master

plans over the 10-year period by expecting to be the “Detroit of Asia” and looking forward to the ASEAN Automotive Hub (AEC) in the year 2015. Furthermore, they have a plan that in the next 10 years that “Thailand is a global automotive manufacturing base along with the value added domestic and eco-friendly supply chain.” According to the third master plan for the automotive industry, all of these master plans were continuing to support the development in the automotive industry from foreign investors. Therefore, as a result, Thailand's automobile and motorcycle production capacity is very high both domestically and in the growing global market for major motorcycles. The potential of this production is linked to other industries, especially the automotive parts industry where Thailand is a large manufacturing base. Motorcycle and component manufacturers have a relation type which is called “Backward Linkage Effect”. As a result, the industry has continued to develop and create value for the country in areas such as employment in labor markets.

However, the industrial sector needed more workers but the number of unemployed increased. It showed that Thailand's labor situation was in shortage in the overall industrial sector. This reflected that the manpower structure does not meet the needs of the industry, especially in skilled labor which is the inconsistency of the education system.

This research study can answer defined questions in the curriculum of the education institute which is consistent with the labor demand of the motorcycle manufacturing industry in Thailand. Did the government and the private sector in the motorcycle industry in Thailand cooperate in preparing the labor productivity in the motorcycle industry? What type and specific subject? And what were the problems and why? Moreover, what type of model is the best and proper situation for the future in Thailand?

The main research has used qualitative methods by collecting data and analyzing documents, including in-depth interviews, group discussions, together with quantitative support. The methodology will investigate the manpower preparation and labor productivity as well.

6.1.1 The process of education development and cooperation between government and private sector in terms of preparation of manpower and development of labor skills in industry

The educational curriculum is operated by the government to improve the learning and career skills of the people and is driven by the National Education Plan. The process of education and cooperation between the government and private sectors has been preparing manpower and improving labor skills in the industry and can be summarized as follows.

(1) The preparation of manpower under the National Economic and Social Development Plan

The first National Economic and Social Development Plan in 1961 focused on economic and industrial development and transportation. The study was designed to develop and expand operations in order to harmonize economic development, especially the promotion of vocational education schools to train the workers to work more professionally. After entry into Phase 2 of the Economic and Social Development Plan, it required the country to develop adequate levels of human capital in each sector. Through a 15-year long-term manpower plan, it focused on increasing the quantity and quality of manpower at the vocational level. At the same time, the university level has expanded in the region, especially focusing on increasing the engineering, science, and other sectors. However, the current situation cannot meet the requirements of the industry sector.

(2) Promulgation of the National Education Act BE 2542

The enactment of the National Education Act BE 2542 (1999) established the law that has supported the country's major educational reforms, especially the bureaucratic structural reform. The development of education systems was divided into two main levels, the first was to reform the vocational education system and professional training and the second was to reform the education in university. In the aftermath, the vocational education and professional training reform has become a bilateral vocational education system (BE 2545–2550). It has provided courses to the student that emphasize training and practice in manufacturing.

In addition, it was the foundation for the drafting of the Vocational Education Act BE 2551. It helped to create the important principle of cooperation between educational institutions and manufacturers. The curriculum has focused more on practical learning in manufacturing. It is called on the job training. Moreover, the education reform has also led to the establishment of professional qualifications institutions (Successfully established in BE 2554) and the National Qualification Framework (NQF) (The Cabinet approved in BE 2556).

(3) Detroit of Asia Policy

In BE 2545, the government initiated the vision of being a “Detroit of Asia”. The period of operation of the project was from 2004–2010. The reason it was needed was to enhance the competitiveness of the Thai automotive industry. The Ministry of Industry was the agency that was designated as the policy-driven agency. While the Ministry of Education had not yet been able to adapt and change the curriculum from that time, the mission needed to produce manpower to support the automotive industry and meet the industry requirements. Therefore, The Ministry of Industry, with the Thailand Automotive Institute, has formulated three master plans for the automotive industry, namely, the Master Plan for the Automotive Industry 2002–2006, the Master Plan for the Automotive Industry 2007–2011 and the Master Plan for the Automotive Industry 2012–2016. The three master plans have adjusted the vision that “Thailand is the automotive manufacturing base in Asia to able to add value in the country together with the part manufacturer.” Furthermore, in 2011, “Thailand will become a global automotive manufacturing base along with environmentally friendly supply chains in 2021”

The individual master plan will have several roadmaps for the development of the automotive industry. Most of them are carried out in cooperation with various agencies under the Ministry of Industry and outside. Therefore, the Ministry of Industry has established “the Automotive Strategy Committee”. The first master plan has to create the competency and enhancement, including 4 work plans. The point of importance of this plan was to create the capacity building programs including engineering projects (engineering), engineering (vocational) projects, and skill development projects. (by the Department of Skill Development, Ministry of Labour)

The implementation plan, the private sector has cooperated with the Ministry of Education to solve the shortage of labor in the automotive industry such as those created by the International Automotive Engineering Degree project in 2005 by Chulalongkorn University, the Diploma of Vocational Education Program of the Automotive Industry Technical College in 1999 by the Department of Vocational Training and cooperation with the Honda Group in Thailand etc. In addition, this project has also developed the capability system for improvement of the labor skills in the automotive industry which provided the standard for the certification of labor skills, along with the development of training courses and the training for the trainers in the major of Stamping, Plastic Injection, Casting and Machining. This project needed cooperation between the government and manufacturers to support the budget as well. Moreover, the industry sector has also provided academic assistance, as well as providing advice and assistance to the teachers, laboratories etc. The development labor skill program was divided into two significant points. The first has focused on education in the universities and colleges. The second has focused on the training program in the institute. However, the problem of education at that time was found that some entrepreneurs saw the course as theoretical rather than practical. And the problem of the training program has found a lack of coordination between the training providers and manufacturers, as well as the courses unspecialized for the industries. Moreover, the project has not been continuing the cooperation between the government and manufacturer for enhancement the labor skills to support the industry needed.

The interesting projects in the master plan for the years 2002–2006 are such various projects such as the establishment of a Training Center for Human Development in the Automotive Industry and the Automobile Engineers Development Project. For the interesting projects in the 2007–2011 master plan, human resources development strategies have become the driving force for human capital in both the management and manufacturing sectors such as established Automotive Industry Human Resources Development Programs: AHRDP for development of the instructors or teachers and labor skills. This project was in cooperation with the government, manufacturers and academics which had the target of adjusting the curriculum to harmonize and meet the automotive industry needs. This master plan emphasizes success factors related to a systemic/coherent, synergistic, strategic,

strategic, transparent, consistency approach in the long-term, and speed of development and collaboration between public, private and educational sectors. The implementation of this project was a direction to promote the country's progress in motorcycle production and meet the government policies. On the other hand, the research found that the government could not afford to provide labor for the private sector. The result has shown that the government has unsuccessful manpower preparation and a drastic transformation of the country. However, for a good view, Thailand was able to effectively address the problem by making the country's automotive industry acceptable to the rest of the world. But it took time to develop the knowledge, capability and his or her own product and innovation in the future.

For interesting projects the Master Plan 2012–2016 has focused on core strategies of excellence, particularly the excellence in human resources development and went further to upgrade the labor skills and engineers, as well as the talented management in the automotive industry.

In addition, this plan has established a network of cooperation in personnel development with both domestic and foreign organizations along with the changing trends and expansion of the automotive industry in the future. This strategy of excellence is linked to the creation of a better environment through infrastructure. It can be seen through various procedures that the cooperation between the public and the private sector has improved steadily. However, the results of the cooperation have not been able to achieve a very tangible result in the development of the performance of the two sectors. As a conclusion, the education system was unable to catch up the technology in the industry at that time.

(4) Promotion of labor training under the Promotion of Skill Development Act BE 2545

Promoting Skill Development is a core mission of the Department of Skill Development under the Ministry of Labour. It was responsible for drafting the National Skill Standards in the field of occupations, encouraging the manufacturer to hire people who have passed the Skill Standards Test, or who have been certified as competent in the field. Furthermore, they have encouraged the establishment of Skill Training Centers, Skill Standards Testing Centers and Knowledge Centers and

encouraged competitive labor skills as well as encourage the cooperation between government and private sector. However, there were still several problems as presented in the previous results. So what are the most necessary ways to make the partnership tangible and beneficial to the country in the future?

(5) The cooperation between government and private sector for manpower preparation and labor development

The starting point of the cooperation between government and private sector needed to be managed systemically and mechanically in order to develop the industrial economy. The important approach was to encourage the private sector to play a greater role and contribute to the development of the country. Therefore, a joint government and private committee was established to promote trade and investment in the country in 1981 (Prime Minister General Prem Tinsulanonda) and is still operational at this time.

The process of developing the cooperation between government and the private sector in terms of education has started from various models such as the Dual Vocational System project from BE 2538–2541 and the Dual System project BE 2527–2537 respectively. Moreover, there was also cooperative education in accordance with the policy of the Higher Education Commission in 2002.

In addition to bilateral and multilateral education, the cooperation between government and the private sector has to prepare manpower and improve labor efficiency. There were also various types of joint committees in the government and private sectors by the following items;

(1) The Joint Government and Private Committee for Production Planning and Human Resources Development (Ministry of Education Appointed in 2009) which was responsible for studying the production and development of manpower planning. The committee conformed to automotive industry requirements and can be a mechanism for improving labor quality.

(2) The National Labor and Employment Development Board, which has appointed a policy-setting committee, guidelines, measures and coordination on labor force development and occupational training. The reason was to improve the labor skills and be able to conform with the National Economic and Social Development

Plan. Moreover, they also established the sub-committee to develop a strategic framework for the development of the labor force in the automotive and parts manufacturers in 2012. After that, the sub-committee established the AHRDA (Cabinet Resolutions of 2013) and opened in 2015 to develop and improve the labor skills, particularly in automotive and parts manufacturer.

(3) The Joint Government and Private Committee for Vocational Education Development (Ministry of Education appointed 2013), has responsibility for development of the labor skills and manpower support in term of quantity and quality. They also established the sub-committee which has launched a bilateral educational pilot project, especially in automotive parts manufacturing. Furthermore, the sub-committee has developed 15 bilateral technical education curricula in 15 technical colleges. Through this cooperation, the private sector was responsible for managing the policy and human resources curricula by the government providing facilities, budget and trainers.

(4) The Public-private steering committee was established for driving the country. (Cabinet approved 2015) The goal was to be a high-income country, coupled with growing participation in all sectors. The committee consisted of government, private sector and society. All the above-mentioned partnerships still needed to find the new direction to push the cooperation to be concrete and beneficial to the country in the future.

6.1.2 Current situation and cooperation issues

6.1.2.1 Consistency between the organization of curricula in educational institutions and the demands of industrial workers

Institutional curricula in educational institutions were not consistent with the labor demand of the industry. It has many causes shown by the following;

(1) The policy formulation of the country's demand for industrial development has been staggering or unclear. And also policy-makers in each government have been disconnected and discontinuous. Therefore, it affected discontinuity of planning and development of educational policies and failed to keep abreast of technological change.

(2) The Road Map on education, industry and labor force was not consistent with the country's human resources. Therefore, the collecting data preparation, the assessment of the quality and quantity of manpower was an important factor in the development of the curriculum.

(3) The educational institutes opened automotive courses by themselves, in general, it has affected the standards of teaching and expertise of the curriculum and instructional personnel, inadequate equipment and machinery.

(4) The curriculum emphasizes theory rather than practice. The curriculum developers have theoretical knowledge and understanding, but they also face problems in the design of practical curricula because of lack of work experience. Therefore, the results were incomplete courses at all levels.

(5) Most instructors or teachers did not have experience in the industry. They never had experience with modern automotive technology, therefore they could not apply the theory to improve and solve the problems in their jobs. However, the course in automotive design was a modern curriculum that students can apply to work in the current organization. But courses related to industrial operations such as mechanical, electric motor or turning system High-grade metal forming were also defective. Based on the analysis of research data to determine the consistency between labor capacity and the needs of the industrial sector, combined with the qualitative research data it was found that vocational training (vocational/diploma) has been developed to the minimum level–medium. The minimal skill level was the general knowledge about the motorcycle production system, ISO 9001 system, ISO 14001, foreign languages related to the job, foreign languages in technical terms, production planning, the evaluation and problem-solving of the work at a more complex level and the basic knowledge and skills to support the 4.0 industry or future technology.

While undergraduates have low-level skills development, the moderate level of skill was in the general knowledge of the production of motorcycles related to the production process and occupational Health and Safety. In terms of measuring tools, knowledge and skills in quality inspection include the use of initial inspection, control, analysis and troubleshooting tools related to the job was at the moderate level. Applying the knowledge in engineering and technology was at the moderate level, included machine control and production planning as well.

6.1.2.2 Cooperation of relevant government agencies and the private sector in preparing manpower for entry into the industrial sector

Preparing manpower to enter the industry has found that students studied and received practical training in the workplace. The reason for providing education was from the following models;

(1) The bilateral system in which students have studied in a particular school for a certain period of time and went to work in manufacturing for a certain period of time.

(2) The pilot project of the bilateral study by the sub-committee together with the Technical Colleges 15 institutes has developed the curriculum to the same standard.

(3) The Co-operative Education and Working Integrated Learning by cooperation between universities and private sector, which focused on the learner performing real work in the workplace. However, the problems arising from bilateral cooperation have failed to meet the stated goals because of regulatory constraints in inter-agency operations. The government did not trust the planning or direction of private education courses. While the private sector was struggling to change jobs in a given course, it affected production. Another important problem, which is the same problem with cooperative education, was the barrier for the number of private learners to be able to practice.

For the development of labor productivity in the industrial sector, it is found that most of the establishments will develop labor capacities in accordance with policies and training management models due to different production processes and technological secrets. On the Job Training (OJT) is based on the Human Resource Development (HRD) theory, which is the first human capital. The public and private sectors developing labor efficiency were as follows.

(1) Establishment of the Automotive Human Resource Development Academy (AHRDA) to develop curriculum standards for the development of labor skills as a trainer of the Department of Skill Development and vocational training institutions in skills related to the automotive and spare parts industries.

(2) The ASEAN Human Resources Development Program (AHRDP) by the Thai Auto Parts Manufacturers Association (TAPMA), Federation of Thai Industries and Department of Skill Development. Moreover, they have provided the general public with training to certify their occupational abilities as well as the standard certification of minimum wage.

In addition, the private sector also played a role and contributed to the development of labor efficiency with government agencies in ways such as upgrading skill development by providing motorcycle mechanics training, developing a motorcycle repair training course or developing the training instructor of the Department of Skill Development to keep up with modern motorcycle technology.

6.1.2.3 The problem of cooperation in the situation of manpower preparation and development of labor efficiency

In terms of the current cooperation situation, there has been some better development. But there were still tangible and ongoing operational problems from the following causes;

(1) In the relationship between internal government, and government and private sectors it is found that the structure of the public sector was overlapping and large. The result was a delayed policy or delayed order. Management of human resource development among government agencies has lacked clear integration. There was no database that all agencies can access and share. Therefore, the collaboration was not as effective as it should be.

(2) Laws, regulations and regulations of government agencies have affected interagency coordination following the decision.

(3) The model of cooperation between both sides; even if they have many committees could not achieve the goal due to lack of seriousness and continuity of policy, especially when government leaders change policy makers.

(4) Roles and functions of individuals and committees; the private sector still lacked clarity in reporting to the government due to competition in business matters. Therefore, the government could not effectively restructure to support the private sector. Government officials have a more authoritarian attitude, so the result was not good response.

(5) To define public policy; the government policy maker has a misunderstanding of the basic industry requirements. As a result, they could not find the right direction to define the road map of the manpower preparation and conform to the industry.

(6) Policy executors have implemented things in different ways even though they have the same policy. The operation plan lacked of continuity and had no common standards. Instructors from the educational institutes and the Department of Skill Development lacked experience and understanding of the actual work.

(7) The curriculum courses; developed by academic persons who lacked real work experience. Most of them were focused on theory rather than practice. And also the standards of each educational institute were not equal. The result affected students' performance.

(8) Labor force; labor force assessment lacked integration of databases from relevant government agencies and the private sector. Therefore, it affected manpower preparation planning and labor productivity improvement.

6.1.3 Government policies and administrations, the cooperation, human resource preparation and development labor efficiency in the future appropriate motorcycle manufacturing industries

The results of the research from the in-depth-interview, focus group analysis and synthesis document review to seek government policy, management guidelines and the appropriate type of public-private partnership have found that

(1) Manpower preparation should begin by identifying government organizations that are directly responsible, promote internal government collaboration and provide coordinated as well as clear direction.

(2) The government should have a policy to encourage youth to learn more at vocational school, improve the curriculum and collaborate with various organizations and support scholarships, the right to work or internships abroad.

(3) The curriculum courses should jointly operate between the public and private sectors. The reason was to create the practical atmosphere at the workplace to enhance your self-learning. The curriculum should be adjusted to reflect the needs of the industry under the same standards at all educational institutions.

(4) The improvement of the Labor Skill Standards should be integrated and continuous in every area, especially in exploring the needs of the private sector every year. And they should be comparable with international standards to enhance competitiveness.

(5) Government should ensure joint investment between the public and private sectors by setting up laboratory or collaborative instruments and modern learning equipment to develop the potential of learners and technological systems. And they also should jointly invest with educational institutions to set up joint research and development units. The government also supports investment in order to develop the education system and production innovation in the future.

(6) Government should establish public and private partnership committees for future tasks such as the National Policy Council together with the private sector, to set the direction of the national education system and also provide the same curriculum standards nationwide to conform with the industry direction. In addition, government should establish an organization or institution by the relevant agencies under the Ministry of Education, Ministry of Labour, and Ministry of Industry together with the private sector. It should be composed of highly qualified technical and management talent from the motorcycle manufacturer. Furthermore, government should invite academic persons, who have the knowledge of motorcycles, and domestic investors to follow the roadmap and plan to develop the motorcycle industry in the country. This organization or institution should directly report the progress of the development plan to the Prime Minister. It is the model that most research participants agree with.

6.2 Suggestion

The Public-private partnerships in manpower preparation and the development of labor productivity in the motorcycle industry were evolving from the past to the present. However, with many environmental factors, manpower preparation and labor productivity development were not consistent with the needs of the industrial sector. Therefore, the researcher would like to propose the alternative model of cooperation which is called the public-private partnerships (PPP) after analysis and synthesis.

This model will consider developing the partnership for human resource development and future labor productivity.

Especially in the automotive industry, the private sector is continuously developing technology every year. Therefore, the manpower preparation and labor productivity improvement in the industry must keep moving forward to catch up the technology as well. Moreover, the future of the automotive industry is shifting the working-class system to work by using a sophisticated tool which is called Automation and Continuity into a robot system. It will be moving forward to the mechanical tool which is called Robotic/Artificial Intelligence. Therefore, the government needs to focus and work closely with the private sector in a more systematic direction. In addition, government needs to create more innovation and improve the capacity of labor force to be able to handle the advanced technology. Otherwise, the country will not be able to reduce educational, living and liberate potential from middle-income countries in the near future.

6.2.1 Public policy and public administration

In order to improve the development of cooperation in the future, the researcher has suggested relevant parties under the concept of public and private partnerships as follows:

6.2.1.1 Government sector

All government agencies

(1) The government should reform the organization and internal operation system, including reducing the overlap of the roles and responsibilities of each agency. And also, government needs to reduce the various committees/subcommittees which are responsible under the same policy.

(2) To promote the human capital in an organization to have the knowledge and ability at all levels in the government sector. Moreover, government needs to improve job function by speeding up and reducing the process of commands. Government also should apply and use a database system to analyze the current job and create an internal control system.

(3) The government needs to develop technology, information and communication systems between internal and external government agencies due to

integration of the policy setting, operational planning and evaluation. Moreover, government should exchange the information which is related to manpower preparation and labor development skills among relevant agencies under the same database.

(4) Government should reform laws and regulations which cover all the agencies. The reason for reforming them is to catch up with global economic change and technology in the automotive industry. In addition, the existence of many laws by many government agencies has resulted in difficulties in the implementation or perception of it for all parties involved. Therefore, government needs to revise all of them for consistency in the same direction.

(5) To promote good governance and law enforcement in government agencies to reduce political interference or conflicts with certain private sectors.

Ministry of Education and affiliated agencies

(1) The person, who works in government, is responsible for setting education policy, curriculum development as well as teachers should develop the knowledge of both theoretical and practical skills related to industrial technology in order to convey and prepare manpower for better knowledge and skills. The study found that curriculum development and management in theoretical or academic are fair. But in practical terms, there are also many obstacles, especially the experience of the manufacturing of the instructor. This makes it impossible for graduate students to work in the workplace before training from the manufacturer. This problem was the above mentioned, the management of the Ministry of Education and agencies have attempted to promote and push forward the private sector to take a more active role and participate in the management of education from the level of development/critique of the curriculum. However, in such cooperation, there are many other issues and obstacles that make the private sector unable or unwilling to participate, such as the production secrets of the organization. The production has to be accelerated so there are no trainers or time to train the students or the problem of not having enough positions to train the students.

(2) In the promotion or development of education, the preparation of modern and adequate materials must be prepared. Under effective government budget management, the government procurement system must be tight due

to reduce corruption and reduce unnecessary waste of budget, which will result in the government agencies having modern tools and can be used following high technology.

(3) There should be a system of governance and follow-up of the cooperation with the private sector in order to prepare manpower in a systematic way to avoid duplication or conflict of interest between government and private sector.

(4) National Education Plan Annual Plan and the educational management plan of the institution should be consistent in the same direction. The Ministry of Education should have a system for controlling and overseeing the education institutes. Otherwise, all courses are without focus on producing expertise. As a result, the labor force entering the labor market has different skills and does not meet the industry demanded.

Ministry of Labour and affiliates agencies

(1) The person, who is a trainer of the government, must constantly develop their knowledge and expertise in both theoretical and practical terms because the technology in the manufacturing is growing rapidly. The results of the study showed that most manufacturers provide training and development of their own labor rather than training from the Ministry of Labour. Therefore, to allow the private sector to accept more training and participation is to expand the skill development target with more advanced trainers and equipment. This operation found that there has been some knowledge provided by private sector to train the trainers, which may improve and enhance the sharing of training to develop labor skills.

(2) The promotion of training must prepare equipment to meet the training needs. However, these materials and equipment should be operated under effective government budget management to reduce corruption and reduce unnecessary wastes of budget.

(3) The person, who works under the Ministry of Labour, is involved in many types of committees/sub-committees/working groups cannot be determined. Therefore, the result has affected the policy and is unable to support the private sector as requested.

(4) Creating the image of professional training and creating channels to reach out to private sector to address their needs and promote cooperative development. The study found that although the government has a policy of

subsidizing/reducing or granting privileges to certain parts of the private sector, the procedure for obtaining benefits such as taxation, is difficult. There are many documents. Therefore, if the government can reduce the procedures, reduce paperwork and use information technology to do so, this may make the private sector more responsive to the performance of government.

Ministry of Industry and affiliates agencies

(1) The Ministry of Industry is the agency that develops the industry according to the country's management policy. Therefore, the Ministry of Industry has established various institutions and technical centers to support the development and transfer of industrial technologies such as Thailand Automotive Institute, Automotive Information Center and Data Center (LEED-X). The study found that the Ministry of Industry must have cooperation between internal and external bodies such as the Ministry of Education, Ministry of Labour and the private sector to improve the efficiency of their performance.

6.2.1.2 Private Sector

(1) Government sector should clarify policy and impact on the private sector so that the private sector can plan and run the business smoothly, including minimizing investment risk.

(2) Government sector should encourage more private sector participation in public sector activities by utilizing the attractive benefits offered to the private sector such as tax privileges in case of training, and development of labor skill or research and development for the industry.

(3) Government should create a fair competitive environment in the private sector to reduce the issue of private non-disclosure, especially relevant information on manpower and labor needs and information related to knowledge in automotive technology. The reason is to bring an opportunity to develop automotive technology and innovation in the country by themselves.

(4) Government should survey and create a database system of private sector/clubs/associations which are related to human resource development and labor development and keep moving forward for the best cooperation. And both sides can able to exchange useful information between each other.

(5) Government sector should collect data on industry needs and continue to analyze the situation of the labor force using the data to plan the manpower and human resources of the country. Based on the private data collection LEED-x database, many private sector respondents did not cooperate in responding to such data. Therefore, the government should plan and leverage these information plans to make the private sector realize the importance of providing feedback for use in further development.

6.2.1.3 Cooperation between Government and Private sector

(1) From current conditions, cooperation between the public and private sectors is multifaceted, including bilateral, multilateral, specialized committees or part of the board by position. The relationship is still involved, and still holds the same position in the organization. The result of this cooperation affected making decision-making which related to the original organization also take time to be returned to the supervisor in a higher command. Therefore, the researcher has proposed the idea of establishing an organization using the Public-Private Partnerships incorporating the Triple Helix Model, which provides scholars and experts in the motorcycle industry with government involvement in manpower development.

The establishment of such a new institution will strengthen the structure of the board committee, i.e. the government will be the core to establishing a national institute for development, education and research with the Prime Minister presiding at the beginning. Modifications are made by the Board of Directors after the proper periods. The new institution is responsible for driving the investment with the private sector. The private sector will play a leading role in the structure of human resource development. And also, the private sector is aware of the need for technology better than the public sector, especially incorporating collaboration with academics and specialists to develop curricula and conducting recruitment of talented individuals. In addition, the role of the new institution must be determined by an independent, decision-making process. The role assignment must be clearly separated due to improve unsuccessful work to be more effective.

(2) Due to the establishment of such a new organization to solve the problem of overlap and too many committees, the government should review the various committees established by the government sector.

(3) Government should improve and develop the relevant laws and regulations. This is due to the fact that the government sector has difficulty in performing its duties. Therefore, the researcher has proposed that the new specific laws are enforced in new institutes. It will be most beneficial without interfering or obeying existing laws and regulations.

(4) Follow-up and evaluation of clear performance in the operation of newly established institutions is a matter of improving operations and to continually develop policies.

(5) Public and private sectors should be aware of the strengthening of cooperation, including the exchange of academic methods, practicality and understand the processes in the industry.

6.2.2 Suggestions for Future Research

6.2.2.1 Suggestions for further research

(1) A research study is to find solutions and develop public-private partnerships in the motorcycle manufacturing industry. Public-Private Partnerships for problem solving and collaborative development conform with the technology in the future.

(2) This new model is to study and find the advantages and disadvantages after implementation and evaluation of the effectiveness of cooperation. The result of this research will be the information for the government to apply in the future.

6.2.2.2 Suggestions for Future Research on Public-Private Partnerships

(1) A study of public-private partnerships in the preparation of manpower and the development of labor productivity in other industrial sectors should expand to broaden the policy.

(2) The model of Public-Private Partnerships in Manpower Preparation and Labor Development should be comparing collaborative Partnerships between investment in monetary and no co-investment. It must analyze the advantages and disadvantages bringing the results of this research to the development of the most effective model properly in the future.

(3) The research is to study and find the relationship among government, educational institutions and the private sector. The results of this research will be efficient to the other industries.

(4) The next research needs to study what kinds of collaboration are the most likely to take place and which types are the most appropriate. This will motivate the private sector to become more confident in engaging with the public sector.

(5) The next research needs to study a comparative of public-private partnerships with foreign countries such as Germany, Japan, China, etc., to analyze similarities or differences in operations and patterns. The results of the comparison will be applied and develop the cooperation between the public and private sectors in Thailand in the future.

(6) The next research needs to study a comparison of public-private partnerships with the Federation of ASEAN Motorcycle Industry. The results of the comparison will be applied to develop the cooperation between the public and private sectors in Thailand in the future.

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APPENDIX A

SUMMARY OF IN-DEPTH INTERVIEWS AND FOCUS GROUP DISCUSSION

Interviewer No.	D/M/Y	Significant points of in-depth interviews
Interviewer No.1	23/02/2017	1. “The founding committee was unable to meet its objectives and could not link the success targets because the structure and roles of each government agency overlapped each other. They also have the goal of self-fulfillment.” 2. “Government agencies are not able to work together effectively. They do not have the same database. Coordination and a lack of information are reported to the relevant agencies.” “Assignments do not match the principal roles and functions of the agency. This was the one reason why the structure was overlapping and there was a lack of coordination through direct assignment.” “The private sector must be sincere in order to inform the genuine needs of the public. The public sector will be able to operate effectively.” 3. “Officers are unable to develop themselves in order to keep up with technological changes. It cannot serve the customer and the private sector.” 4. “The complexity of the law.” 5. “The Ministry of Education and the Ministry of Labour lacked in the cooperation in the curriculum of manpower preparation and the working age to be consistent with the development of efficiency and quality both before and after entering the industry.”

Interviewer No.	D/M/Y	Significant points of in-depth interviews
Interviewer No.2	23/02/2017	1. “The leader is unable to understand the automotive needed.” “The committee has been a success but it is not possible to offer concrete solutions. There is no scope for assessing work plans, not being presented as a policy. And it's taking a long time to get approved.” “The committee, which is the representative, has no real decision-making power.” 2. “Government officials and the private sector do not pay serious attention and lack of data linkages.” “The private sector did not pay much attention to sending its employees to training in accordance with the expectations of the intended objectives. The private sector still has its own training model. These results are in a real partnership that remains productive.” 3. “There's a lack of continuity in the policy due to change of management or policymakers.”
Interviewer No.3	07/03/2017	1. “Government agencies are overlapping. There's a lack of integrated collaboration.” 2. “Communication between relevant government agencies. The government and private sector has a lack of continuity.” “Public-private partnerships are unable cooperate. Although many joint committees were established, they did not achieve their stated goals.” 3. “Policy makers still cannot access the motorcycle industry. Therefore, the design of certain courses has resulted in the inability to fully understand the needs of the industry.” “The instructor has inexperience in working within the motorcycle industry, so the theory cannot be applied.” The leadership or government policies have changed following the new government. This results in the government officer being unable to work continuously.” 5. “The Development education curriculum is not in accordance with the new technology”

Interviewer No.	D/M/Y	Significant points of in-depth interviews
Interviewer No.4	03/03/2017	1. “Government agencies have overlapped. There is a lack of integration. Leadership change or government policies are changing according to the needs of those who come to lead the country. As a result, government officers are unable to work continuously.” 2. “Communication between relevant government agencies or the government and private sector is lacking in continuity of the policy. This result is affected by changing executive positions or direct government policies, as well as the government not knowing exactly which relevant government is mainly responsible for job.” 3. “Practitioners cannot implement policies because of a misunderstanding of the policy.” “Policy changing is based on the government leader.” “Policy makers still cannot indeed access the motorcycle industry. Therefore, the education curriculum does not meet the industry needed.” “Instructors and teachers do not have real experience in working within the industrial sector. This result affected knowledge of the manufacturing process and the solution.” 5. “The curriculum has some subjects which were unable to match with the new motorcycle technology. Therefore, the students could not work completely after graduation.” “University – private co-ops will begin to set up curriculums, focusing on the private sector as a leader in technology management and integrating academic theories. Most courses are available to students working in manufacturing to understand the production process. However, the project is not yet widespread. There are also obstacles from the manufacturer to accept the students today.”
Interviewer No.5	15/03/2017	2. “There’s a lack of cooperation for using the same data base between internal governments. The government does not meet the private sector’s requirements. Therefore, the government cannot analyze and develop the education curriculum in accordance with the industry’s needs.” 3. “The instructors or curriculum developers do not have the knowledge or understand the motorcycle technology due to inexperience in manufacturing.” 5. “The curriculum is not able to move forward with quickly technological advances.”

Interviewer No.	D/M/Y	Significant points of in-depth interviews
Interviewer No.6	06/03/2017	1. “The rotation or changing of the government leader is affected to the education institute that cannot continuously the policy and also some projects were discontinued. Therefore, it will cause to develop the education courses.” 3. “The curriculum defender does not have the experience in manufacturing but he has only an academic background.” “The instructor has no opportunity to practice in the manufacturing or use the tools, machinery or equipment. This inevitably results in a lack of experience in the production processes. This will hinder the implementation of practical knowledge to effectively communicate with students.” “Instructors have the ability to modify and create knowledge faster if they have the cooperation from the private sector.” 4. “The law enforcement is complex.” 5. “The development curriculum is unable to catch up the advancements in technology.”
Interviewer No.7	12/03/2017	1. “The government structure is overlapping with large organizations. The policy or command is very difficult. The improvements in job functions or presentation of new policies take time to complete. As a result, new policies are not being applied and accommodated in time.” 2. “Overall, the government is meeting together. All private investment information will be accessible to clarify all data and be able to plan in preparation to accommodate at any time. However, in the past, the government has been unable to cooperate and share information in a tangible way. As a result, the public sector is unable to achieve its goals and provide adequate or effective support the private sector.” “Each generation of government has a lack of integration. There is a policy of discontinuous administration. The National Economic and Social Development Plan cannot be implemented.”

Interviewer No.	D/M/Y	Significant points of in-depth interviews
		3. “The rotation and position changes affect cooperation between internal governments. As a result, the cooperation between the government and the private sector is always an obstacle.” “Most professors are not actually working within the industry. Therefore, they cannot see the working process in the manufacturing. As a result, they are not able to solve problems when faced with process design problems or similar.” “The educational institution is still lacking in equal standards, especially both the curriculum and instructors. As a result, students are not able to increase their knowledge within the system.” 5. “The educational program is confusing in the design of advanced technology-related industrial process. As a result, both the vocational/diploma and undergraduate curriculum are incomplete.” “The Education system is focused on theory more than practical. As a result, the vocational/diploma/undergraduate students cannot apply to proceed with their job.”
Interviewer No.8	24/02/2017	“Private automotive technology leaders come from many countries and many companies. It is difficult for the government to choose one company’s technology as a model and also there are still competitive business factors that effectively influence to support private sector.” “There’s a lack of mutual recognition in terms of the attitude of the government authority; therefore, it is very difficult to cooperate of each other.” 3. “Policy makers misunderstand the automotive industry. As a result, the visions of the direction of the automotive industry are unclear.” “The transferring position in the short term or the end of term affect the continued policy implementation.” The policy discontinued and is unrelated to the national economy, society and education.” 5. The curriculum goes behind the automotive technical industry. Most of the study programs are only teaching theory rather than practice; therefore, students are not able to perform effectively.” “Current bilateral education is a good project, but it still cannot achieve goals. Must focus on clearly defined requirements.”

Interviewer No.	D/M/Y	Significant points of in-depth interviews
Interviewer No.9	10/03/2017	3. “The leader has changed; the policy will end up changing.” 5. “Technology is changing rapidly; it is difficult to develop the curriculum to catch up the automotive industry.”
Interviewer No.10	21/04/2017	2. “The lack of coordination among relevant government agencies has impacted their role and responsibility. As a result, they will not work as a team.” 3. “Educational policy makers make mistakes by not following the automotive industry.”
Interviewer No.11	24/02/2017	1. “The structure and function of government agencies are overlapping and lack coordination.” 3. “Policy makers do not understand the needs of the automotive industry. The government does not have a main department to survey industry needed. As a result, the government cannot develop a plan to support the automotive industry.” 5. “The curriculum is in accordance with automotive technological industry.”
Interviewer No.12	27/02/2017	1. “The government structure is complicated.” 2. “Thailand lacks cooperation with the private sector in making strategic planning and direction of the industry. In addition, the government lacks any inquiries into the private sector needed in order to prepare the manpower in accordance with the industry.” “The policy discontinued implantation due to a weakness of internal government cooperation.” “Public administrators do not trust the planning or direction of private education courses.” 3. “Modification of government policy in each period or transfer the government executive officer and so on by following orders from politicians who come to manage the country.” “The policy discontinued implementation” “Policy makers do not have the automotive industry’s knowledge.”

Interviewer No.	D/M/Y	Significant points of in-depth interviews
		4. “Law enforcement is complicated to implement between internal governments.” 5. “The curriculum is not in accordance with the automotive industry.” “The current curriculum only focuses on the ability of students to be repairers. It cannot act as a manufacturer and continue studying in higher education.” “In order to solve problems in this current situation, the bilateral education system is established to support and cooperate with the private sector by following the strategies of manpower preparation and labor productivity on the industrial sector.”
Interviewer No.13	27/02/2017	1. “There is a conflicting of the internal government structure in their roles and responsibilities. As a result, it has affected the process of the policy and implementation.” 2. “The cooperation between internal government, private and private sector, as well as the government and private sector is not clearly coordinated.” “There is discontinuity of planning or implementation into action due to policy conflict and competition with different goals.” “There’s a lack of mutual recognition: even if they work in the same or different positions due to the benefits of the career paths of individuals and agencies. This results in unsuccessful assignments.” “The technology of each organization is most likely secret. Therefore, it is difficult to create courses that are consistent with the needs of the industry.” 3. “Job change, job rotation and individuals taking advantage over common interests are affecting the continuity of setting national curriculum development policies in accordance with national industry master plans.” “Policy makers, practitioners, learners and entrepreneurs respectively are irresponsible in their role, lack spiritual effort and tolerance to apply the knowledge to follow up on any technological changes.”

Interviewer No.	D/M/Y	Significant points of in-depth interviews
		“There are more open automotive courses in university without the quality of facilitator equipment and laboratory. As a result, students who have graduated are disqualified and unable to apply knowledge in the industry sector.”
Interviewer No.14	28/02/2017	2. “The industry is unable to provide enough workplace for the cooperative and bilateral education.” 3. “The government officers (operation position level) do not have the technological knowledge and misunderstand the automotive industry.”
Interviewer No.15	02/03/2017	3. “The policy makers (government) of the curriculum misunderstand the process of the motorcycle.” 4. “The law enforcement is complex.”
Interviewer No.16	04/03/2017	1. “The government agencies complicate the organization structure and are unable to work together.” 2. “There’s no data based center.” “The industry sector has a particular policy to provide practical and management training courses, especially in Japanese company. It’s called ‘on the job’ training.” “An unclear industry policy: means to replace students for a shortage of the labor force in the industry in order to support business growth.” “The capability of the industry is unable to support the bilateral education project if comparing the ratio between students and the industry.” “Most of industry has the individual competitive technology, especially the new model. Therefore, it is very difficult to disclose the technology for the educational institution.”

Interviewer No.	D/M/Y	Significant points of in-depth interviews
		3. “The government has a shortage in the preparation in new generation manpower.” “Policy makers or curriculum developers lack understanding of the automotive industry due to inexperience in the workplace and the device tools and machinery, including the rapid development of technology. Therefore, it makes them not understand the system and procedures for assembly in the motor vehicle industry.” “Instructors cannot practice manufacturing and they cannot transfer technological and production knowledge.” “There is political interference with government officials. As a result, the policy changes every time and discontinues in development.” 4. “The limitation of legal regulations of each government agency affects the cooperation between the government and the industry.” 5. “Educational programs are not prepared to accommodate changes in technology.” “The government still has no curriculum to develop private sector officers. At this present time, the private sector has the technologically advancement over the government.”
Interviewer No.17	05/03/2017	1. “The government structure, role and responsibility overlap each other.” 3. “Policy makers and curriculum developers misunderstand the industry.” “Teachers and facilitators cannot transfer practical knowledge due to a lack of training in technology and experience in manufacturing.” 5. “Curriculum development should focus on both theoretical and practical aspects.” “The curriculum does not match industry requirements.” “The curriculum of evaluation is unclear. The main reason is entrepreneurs are not able to carry out the traineeship as determined by the curriculum. In addition, the rotation and training at each function of production may affect the production process.”

Interviewer No.	D/M/Y	Significant points of in-depth interviews
Interviewer No.18	10/03/2017	2. “The manufacturing capacity is inadequate for cooperative and bilateral education systems.” “Government agencies should compile all relevant agencies to be at the center and represent work within the private sector. The cooperation should start with curriculum design and instructor training programs to create opportunities for students to practice in the industry. All private companies must be sincere in promoting the overall development of labor mobility but not for the benefit of self-organization.” “The cooperation between the public and private sectors does not clearly integrated policies and practices. As a result, each party must design and manage its own manufacturing. Therefore, it does not meet the same standards as the objective.” 3. “The policy makers misunderstand the automotive industry.” “There should be a committee to review the curriculum every year in order to focus on the technological changes within automotive industry.” “The policy implementation is unsuccessful because of changing and discontinuing the policy.” “The government and private sector may always change the person in charge. And there is no continuous transfer in the job function.” “The process of drafting the standard of labor professional skills is very slow and unable to catch up the technological automotive industry changes.” 5. “The design of engineering courses in various majors is an academic and theoretical design. Most of the courses do not understand the industry’s needs.” “Cooperative education is only small volume supported by the manufacturing industry.” “The educational institutes should have the same curriculum standards nationwide, especially the practical training standards which are currently adequate.”

Interviewer No.	D/M/Y	Significant points of in-depth interviews
Interviewer No.19	11/03/2017	“In order to develop more specialized skills, the company must consider sending employees to attend training courses that they wish to develop. However, some courses are on the Department of Skill Development’s list while other courses require training from private institutions.” 1. “The overlapping structure of officers in each government sector is the main contribution to the unpredictability of policy distribution.” 2. “The current cooperation cannot solve the problem.” “The automotive industry does not get enough support from the cooperative and bilateral education system.” “There’s no data base center in Thailand.” “The distribution of information to the authorities to share responsibility will help and prepare the relevant plan in order to provide a curriculum and training program for development of the labor force.” 3. “The preparation of the educational curriculum should be defined as a country roadmap in accordance with industrial development by engaging the private sector as much as possible to ensure clarity and reflect technology transfer to meet the needs of the automotive industry.” 4. “Laws and regulations are only provisional. As a result, government agencies have difficulty in coordinating or collaborating with each other.”
Interviewer No.20	11/03/2017	1. “Government agencies are responsible for many agencies, despite the establishment of several committees. But both authority and responsibility are not able to make a concrete decision, because they have to present to agency supervisors for approval.” “Some committees have the same function, even with different names.” 2. “Government and private sectors lack mutual trust and acceptance.”

Interviewer No.	D/M/Y	Significant points of in-depth interviews
		“The government does not provide an overview of labor and students across the country. As a result, data cannot be analyzed for effective labor development.” 3. “Defining government policies does not understand the basics and the real needs of the industry – or there’s no cooperation in technology exchange with foreign investment.” “Teachers lack the experience and opportunity to practice from the tools and equipment of modern technology, including working in manufacturing. As a result, the teachers cannot touch the actual process and approach to find solutions to solve the problems encountered in the production process.” 5. “The curriculum does not match the automotive industry’s requirements.”
Interviewer No.21	08/03/2017	2. “Government communication is not effective.” “Government agencies are not efficient enough to empower to labor force in the automotive industry due to a lack of staff and instructors who have a thorough understanding of the advanced production system and machine tools related to technology. As a result, the company did not send employees to attend training.” “Relevant government agencies are not coordinating to create collaborative efforts to improve the efficiency of manpower preparation. They do not have any compatible data of labor to share with each other.” 3. “The curriculum developers are inexperienced working in the automotive industrial sector. There is a misconception of the automotive industry only to create theoretical courses.” “The inexperienced instructors of the automotive industry have failed to meet the needs of the private sector.”

Interviewer No.	D/M/Y	Significant points of in-depth interviews
		4. “The legal constraints among the ministries are important factors in coordinating government agencies. As a result, the policy is delayed. It cannot support the needs of the rapidly growing private sector.” 5. “The course syllabus is designed to understand only the curriculum design from an academic context and lacks a clear view of the automotive industry. Therefore, it cannot access the industry’s system, knowledge and ability of the students to enter the labor market.”
Interviewer No.22	08/03/2017	1. “The government’s structure, role and responsibility are complicated and overlapped.” 2. “The government’s direction and industrial policy are unclear. Therefore, the private sector’s confidence affects cooperation between one another.” “The automotive industry has a limitation to accept students in the bilateral system to practical training in manufacturing to meet government goals. As a result, education institutes are unable to set standards in teaching and training.” “The government sector has weaknesses in public relations, development information and training for private entrepreneurs.” 3. “The development of personnel instructors to understand modern automotive technology is important in the transferring of knowledge to the students.” “The government does not have the investment incentives to build on the strengths of the automotive innovation. The leader of the country is determining the direction of the policy, depending on the entrepreneur. There are no private promoters who are Thai investors or academics or experts that can operate independently. The leader is mainly dependent on foreign innovation. As a consequence, the country cannot afford to have main products. Additionally, it is impossible to define a unified education curriculum or focus on Thai innovation as well.”

Interviewer No.	D/M/Y	Significant points of in-depth interviews
		4. “Law and regulations are limited and complicated.” 5. “Educational programs are focused on theoretical learning rather than practice. Although some institutions try to improve their learning in practice, they still suffer from a lack of tools, experimental machinery and lack of modern equipment.”
Interviewer No.23	09/03/2017	2. “The cooperation is unable to solve the current problem.” “There’s no data base center in Thailand.” 3. “The leader of this country does not understand the automotive industry’s requirements.” 5. “The curriculum is not consistent in the automotive industry.”
Interviewer No.24	09/03/2017	2. “The cooperation is unable to solve the current problem.” 3. “The policy is discontinued.” “The policy makers do not understand practical working in the automotive industry.” 4. “Law and regulations are limited and complicated.”
Interviewer No.25	16/03/2017	1. “Too many committees.” 2. “The cooperation is unable to solve the current problem” “Government communication is not effective.”
Interviewer No.26	14/03/2017	1. “The government agencies’ structure, roles and responsibilities are complicated, overlapped and lack an integration of working together. They only focus on specific jobs that fall under their own individual job title within the ministry.” 2. “The government lacks a basic database storage center that could participate for sharing the information.” “Educational policy makers do not have a true understanding of the automotive industry because they cannot cooperate with the private sector. Even with the establishment of a working group, it is impossible to find conclusion of each other.”

Interviewer No.	D/M/Y	Significant points of in-depth interviews
		“The private sector has a competitive production and sales policy. It is difficult for private individuals to disclose their strategies to their competitors. It is a problem that the government is unable to obtain the accurate and complete information required by the private sector. Therefore, it has affected planning to guide the development of national education curricula for growth and to meet the needs of the private sector.” 3 “Course developers lack practical knowledge in the industry.” 4. “The government is governed by various regulations. The establishment of a working group from different agencies has resulted in difficulty in implementation, especially proposal of policy process, budget preparation and decision making which cannot be done immediately or a lack of law to support whether the policy is approved to lead to action.” 5. “Educational Program Government agencies are not prepared to accommodate changes in technological advancement. There is still a pragmatic approach to learning and teaching the same as previously.” “The curriculum development remains unclear of its understanding of the motorcycle industry. It does not focus on one of the major subject specific to teaching students. Therefore, most students who have graduated will not be able to work in the automotive industry even though the curriculum is to study to a higher level.”

1. Model, structure, role and responsibility of committees
2. The cooperation between the government and private sector
3. Policy maker, practitioner and implementer
4. Law and regulations
5. Curriculum

2. Focus Group Discussion

Fist Discussion

April 6, 2017

At the Human Resources conference room, Ladgrabang Industrial Estate,
Ladgrabang District, Bangkok

Researchers have focused on a focus group discussion as a guideline for confirming the policy development and public administration in the case of public-private partnerships in labor skills' development. The participants of the focus group discussion included 8 people.

In summary, the comments of participants in focus group discussion are as follows:

1. The consistency issue between knowledge, skills and attitudes of labor entering into the motorcycle industry with industrial requirements. The participants in the focus group discussed that knowledge, skills and attitudes of labors are unable to work immediately in motorcycle manufacturing after graduating one year from the education institutes. Most graduates should be trained in the workplace before they can work in the basic production process. The main factor is that students that have graduated mainly studied theory rather than practical in the educational institution. Therefore, practical learning will help students learn how to apply the specific tools, new machinery and the solve problems while in operation in the workplace as well as rapidly changing industrial high technologies. Moreover, the domestic market has resulted in the motorcycle industry in Thailand continuing to develop and operate in the long term, including government policy which has supported the motorcycle industry. As a result, the cooperation between government and private sector will encourage the accelerated preparation of manpower and labor development efficiency and provide a curriculum plan in accordance with both the current and future technology.

2. The development of labor efficiency issues in the private motorcycle manufacturing industry, in most cases, will have an individual plan to train and develop labor at every level. The objective is to learn about corporate culture and other practices, especially on-the-job training is the way most establishments adopt

newly graduated student training. In addition, as the majority of the motorcycle industry is owned by multinational corporations, the training program will have overseas headquarters training or expatriate training in local manufacturing. The private sector will be conducted. Meanwhile, the current cooperation between the government and the private sector is to coordinate with internship support, cooperative education, field education visits and as a lecturer to the school, as well as participation in skills' competitions. Furthermore, the private sector is seen as part of CSR or, from another perspective, as a channel for recruiting future employees, which reduces training costs.

3. Policy issues in curriculum development and internal government officer development skills in government agencies cannot keep moving in accordance with technological developments in the motorcycle industry, particularly in technology from foreign companies. As a result, the manpower – graduates from educational institutions – is entered into the industrial or labor market and continues to operate according to the manual and instructions. It is not possible to develop new innovations within the industry. Institutional issues in curriculum standards and the emphasis on theoretical content are overwhelmed by the value of graduating degrees in Thai society, rather than responding to the needs of the industry. The government is providing independent and diverse curricula in non-specialized educational settings, resulting in a process of teaching and non-standardized workforce. In addition, government agencies, which are responsible for labor development, continue to delay operation because of too many government procedures. The technical government trainers do not have the required skills for the motorcycle system. This result will not instill confidence in the private sector in order to send their employees to receive the appropriate training.

4. The issue of cooperation between the government and private sectors such as bilateral, multilateral, MOUs for training and development of labor or manage specific courses as well as donating engines and motorcycles for learning was discussed. Even in terms of the national committee, the issue found that the policy process is discontinuity in the operation. The reason of this cooperation issue is caused by the changing policy-making leaders, policy followers and even the private representatives themselves. The lack of mutual trust from the private sector is to

develop cooperation due to business competition, technology and so on. As a result, the cooperation between the government and private sector still remains the same as the previous situation. It cannot move forward to solve the current problems if the government does not change the model for cooperation.

5. The proposed plan is to set up a new institution or organization under the cooperation between the government and the private sectors. It is interesting to conduct a thorough study of the benefits and disadvantages of collaborative and labor-related problems under reciprocal management of each other. Additionally, the countermeasure to support this new partnership model must be considered for continuous and sustainable operation even in terms of political changes.

Second Discussion

April 22, 2017

The Automotive Worker Council, Thailand

1. The consistency issue between knowledge, skills and the attitudes of labor entering to the motorcycle industry with industrial requirement was highlighted. The participants in the focus group discussed that knowledge, skills and attitudes of labor are unable to work immediately in motorcycle manufacturing industry, especially during working in the production process. As a result, the manufacturer needs more time and budget to train and development labor skill to be able to work in motorcycle industry effectively.

2. The development of labor efficiency issue in the private motorcycle manufacturing industry has the individual training program for development labor skills. It is called the *On the Job Training Program*. Most of the private sectors don't wish to join the training program with the development of labor skills. The reason is caused by the unmatched technology in motorcycle industry. The training programs are mainly focused on the after sales service. However, the private sectors often support the experts and also provide training workplaces for schools and government agencies rather than receiving training the government sector. In the future, if the private sectors are actively involved in the curriculum development process, practical leaning and training programs may affect to the preparation of manpower before entering into the motorcycle industry where both efficiency and quantity are adequate for the industry.

3. Policy Issues in curriculum development and internal government officer development skill in government agencies should enhance the private sector to participate during the making of the policy. The main reason is the private sector is particular in its technological knowledge and expertise in production technology. Therefore, curriculum development and labor development skills are very important so the government should listen and benefit from more input from the private sector to work together in making a new policy. In turn, the preparation of manpower will develop the labor skills in accordance with the motorcycle industry requirements.

4. The issue of cooperation between the government and private sectors focuses on the significant obstacles such as a delayed bureaucracy system, complicated procedures, regulations and law-enforcement. Better cooperation aims to provide the countermeasure to conduct and reduce the currently problems. In addition, the cooperation issue is caused by the changing policy-making leaders or government practitioners to operate policy settings. This affects the private sector as it cannot prepare a plan accurately to follow the latest government policy. Therefore, a bureaucratic system should be unlocked to provide new ideas to improve the public-private collaboration.

5. One proposal is to set up a new institution or organization under the cooperation between the government and private sectors. The participants in the focus group agreed with the researcher's proposal. However, the new cooperation must not be complicated. Conversely, it should be attractive to the private sector in order to improve efficiency in the future.

Third Discussion

May 5, 2017

At the Human Resources Conference Room, Ladgrabang Industrial Estate,
Ladgrabang District, Bangkok

Researchers have focused on a focus group discussion as guidelines for confirming policy development and public administration in case of public-private partnerships in labor skills' development. The participants of the focus group discussion included 8 people.

In summary, the comments of participants in focus group discussion are as follows:

1. Policy issues for government-private partnerships from the past to the present cannot express a concrete result. It is evident that the resolutions of several committees, such as the National Labor Development and Training Coordinating Council, established in BE 2552, have not been formulated policies which has been enforced and achieved its goals. The reason may have occurred due to the reason that the government has never surveyed the private sector needed, including the fact that government executives lack follow-up and in-depth coordination with the private sector. Furthermore, the government does not fully understand the technological knowledge from the motorcycle industry. It has tried to make countermeasures for encouraging the projects that government needs to support the private sector. Until now, the private sector has the individual countermeasure to conduct its own projects such as creating a training program for each company or giving the scholarships to employees to train aboard, etc. It demonstrates that the government policy cannot solve the problems of development the labor efficiency in the near future.

2. The policy implementation issues: it has been affected from the beginning of policy making. Therefore, the government cannot achieve its goal or implement it to the public because of its cooperation model. An example of this obstacle cooperation is that the committee doesn't understand the process of developing labor skills in the motorcycle industry field and there's also a lack of a database in labor skills within labor market and industry requirements. All databases are very important for the committee to analyze and provide the result to create a

policy but none were established. Furthermore, most of the committees do not have a job function, KPI or decision making element to evaluate their job. This is reflected in the policy implementation and delayed policy. This is a weak-point of the current cooperation model.

3. Labor efficiency and performance issues: The direct responsibility of the government agency is the Department of Skill Development from the past to the present. There is “backwardness” behind the technology when compared to the private sector. Therefore, it is not able to support the requirement for training and development of the private sector in order to follow up the technological changes. The main issue is not well coordinated between one another. Furthermore, the Department of Skill Development does not encourage the internal government officers to participate with technology owners in order to improve their skills. These results show an inability to transfer knowledge to the trainees effectively and reduce confidence from the private sector regarding the Department of Skill Development.

4. The issue of the preparation of manpower in terms of consideration: The cooperation between the government sector and the Ministry of Education cannot coordinate in-depth with the private sector because of an informal policy with the private sector. And, most importantly, the private sector must have a supportive position to be able to implement the policy. Most are entrepreneurs who make the MOU (joint agreement) with the school. If a school cannot make a joint agreement, it will not be possible to expand the relevant projects such as the policy of pushing bilateral projects in the past. All these factors are a result of the lack of long-term shared planners in the public and private sectors or the inadequate coordination between policy continuity in both sectors. As a result, the preparation of manpower preparation does not meet the private sector requirement.

5. The issue of the proposal of joint investment or public-private partnerships model: The participants of the focus group discussion agreed that it creates mutual benefit between both the public and private sectors. This will cause both parties to make the most of their efforts to maximize mutual benefit. The private sector is more understanding of the current problem than the public sector and will be concerned about the global business changes, especially the direction of technology development to meet the global motorcycle industry. In addition, the private sector

understands the structure of technology systems and how to create a curriculum in order to prepare manpower from the first stage of the education system and develop skills to meet the industry needed. For joint ventures, the approach might be the government sector as the main investor and the private sector is the supporter, such as some budgets and the leader in strengthening the implementation guidelines, which include: Structured learning equipment related technology systems, safety in the working process, solving problems, analyzing and creating new innovations related to the motorcycle industry. In addition, the attendees agreed that: Implementation of this type of cooperation will be a quick response and solving the problem. And it directly affects the development of labor efficient in motorcycle industry. Indirectly, it encourages the workers to have the knowledge in order to create their own innovations in the future. Therefore, the participants agreed with the results of the study, which indicated that traditional public-private partnerships still cannot be effectively implemented. This results in fatigue and does not meet the requirements of the private sector. The final group discussion agreed with the cooperation proposals in new model of public and private partnerships as the researchers explained above for the preparation of manpower and the improvement of labor productivity in the motorcycle industrial sector.

APPENDIX B

IN-DEPTH INTERVIEW QUESTIONS AND QUESTIONNAIRES

1. In-depth Interview Questions

Name

Surname

Position **Company/Authority**

Date

Time

Place

Interview Issues

1. Policy formulation for the development of labor skills begins from the preparation of educational curriculum for the development of knowledge as well as people's ability to prepare before entering motorcycle manufacturing, including the continued development of skills during entry into the industry.

2. Administration of the government and private sectors is significant.

3. Cooperation between the government and private sectors in terms of administration is related to strengthening the development of labor skills.

4. The process of government policy-making contributes to implementation.

5. The role of labor unions is related.

6. Suggestions and recommendations improve the model of efficiency for cooperation between the government and private sectors.

Issue 1: Policy formulation for the development of labor skills begins from the preparation of educational curriculum for the development of knowledge as well as people's ability to prepare before entering motorcycle manufacturing, including the continued development of skills during entry into the industry.

1.1 How do government agencies and organizations develop curricula for pre-employment education and workforce development after entering the industry, from the past and the future?

1.2 Does the private sector have policies and management for developing skills during the transition to industry?

Issue 2: Administration of the government and private sectors

2.1 The management of government agencies is related to the development of labor efficiency and manpower preparation by education management. What are the management procedures? And what is the relationship?

2.2 How is the management of the private sector related to the development of the labor efficiency process? What are the relationships and implications for government agencies?

Issue 3: Cooperation between government and private sectors in terms of administration is related to strengthening the development of labor skills.

3.1 Does the government, government agencies, and the private sector involved in the motorcycle industry in Thailand work together to prepare manpower before entry into the motorcycle industry?

3.2 Does the government, relevant government agencies, and the private sector in the motorcycle manufacturing industry in Thailand work together to improve the efficiency of the workforce for the motorcycle industry? What types? What subjects?

3.3 What kinds of government, relevant government agencies and private sector entities in the motorcycle industry in Thailand face problems of policy cooperation and policy implementation? Why? How can the problem be solved?

3.4 How do government and private sector agencies attach importance to policies and management to prepare manpower for labor productivity improvement?

3.5 How do public-private partnerships for preparing manpower and improving labor productivity affect the industry? How do they differ from past to present?

3.6 What is the efficiency of management and administration between the public and private sectors? How is the pattern of management and co-operation between the two sectors affected?

3.7 What do the relationships between government agencies and the private sector look like?

3.8 What kind of regulations and law enforcement support cooperation between the government and private sectors to develop labor skills in the motorcycle industry? How?

Issue 4: The process of government policy-making contributes to implementation.

4.1 Is there a clear and concrete set of policies and operational plans between the public and private sectors?

4.2 Does the government continue to implement policy? How? If not, why?

4.3 Does the government use the evaluation and results of policies to review the practical link between the public and private sectors? How? Who is the person in charge?

4.4 Can manpower preparation and labor development skill policies be put into practice? What is the problem? How? If there is a problem, why?

4.5 The Skill Standards System of the Department of Skills Development under the Ministry of Labour from the past until now: What are the problems and why?

Issue 5: Role of the Labor Union is related

5.1 What is the current role of labor organizations in improving labor productivity?

5.2 What role should private labor organizations play in the co-development of labor productivity?

Issue 6: Do suggestions and recommendations improve the model of efficiency for cooperation between the government and private sectors?

6.1 Are organizing educational courses in educational institutions and the development of labor skills in the public sector in accordance with the knowledge, skills and labor efficiency of the motorcycle manufacturing industry required in Thailand? Should they be both quantitative and qualitative?

6.2 Has the management of public-private partnerships in manpower preparation and labor productivity development in the motorcycle manufacturing industry from the past until now used the right model? Or should there be new management model change?

6.3 Is the government policy and administration for manpower preparation in the motorcycle manufacturing industry proper? What should the development of proper labor efficiency be?

6.4 Is the private policy and administration for manpower preparation in the motorcycle manufacturing industry proper? What should the development of proper labor efficiency be?

6.5 How should the model of public-private partnerships in preparing people for the industry and the development of labor productivity in the motorcycle industry be appropriated in Thailand? Why?

6.6 Should the Skill Standards System for the Department of Skills Development under the Ministry of Labour be improved? What should they do?

2. Questionnaires

Questionnaire #1

Chief level or upper level of Production and Quality

Explanation

1. A questionnaire for public-private partnerships in manpower preparation and labor development skills is proposed for the following purposes:

1) To assess the consistency of labor skills in accordance with the demands of the motorcycle manufacturing industry

2) To provide information to support the implementation of public-private partnerships in the preparation of manpower and the development of labor productivity in the motorcycle manufacturing industry in Thailand for more effectiveness.

2. The questionnaire is divided into 3 parts:

Part 1. General information about the respondents

Part 2. The ability of labor to manage their government education curriculum

Part 3. Suggestions and recommendations

**Questionnaire: Cooperation between the Public and Private Sectors for
Providing Workforces and the Development of Labor Efficiency
in the Industry Sector**

Part 1 General information about the respondents

Explanation: Please mark ✓ in the appropriate box ☐

1. Sex

☐ Male

☐ Female

2. Age (Years)

☐ 25-30

☐ 31-35

☐ 36-40

☐ 41-45

☐ 46 up

3. Education level

☐ Below Undergraduate

☐ Graduate

☐ Master's Degree

☐ Ph.D. Degree

4. Years of service

☐ Less than 1 year

☐ 1-5 years

☐ 6-10 years

☐ 11-15 years

☐ 16-20 years

☐ 20 years or more

Part 2. The ability of laborers under management from government education curriculum

Explanation: Please consider the government sector's development of the education curriculum. What level of feedback do you have? Mark ✓ in the ☐ the table of each question based on the following criteria.

5 Excellent

4 High

3 Moderate

2 Low

1 Least

[illegible]

[illegible]

No	The laborers' ability under the government conducted the education curriculum	Curriculum									
		Vocational/Diploma					Undergraduate				
		Level of comment					Level of comment				
		5	4	3	2	1	5	4	3	2	1
2.17	Laborers are able to control the automotive electrical system										
2.18	Laborers are able to create a production plan										
2.19	Laborers are able to evaluate and solve complex problems										
2.20	Laborers have knowledge and skills to work in Industry 4.0 or future technology										

Part 3. Suggestions and recommendations

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Questionnaire #2

Human Resources Officer

Explanation

1. A questionnaire for public-private partnerships in manpower preparation and labor development skills is proposed for the following purposes:

1) To assess consistency between the preparation of educational courses in manpower preparation with labor skills in accordance with motorcycle manufacturing industry requirements

2) To identify the effect of training to improve labor skills by government agencies before entering motorcycle manufacturing

3) To provide information to support the implementation of public-private partnerships in manpower preparation and labor productivity development in the motorcycle manufacturing industry in Thailand

2. The questionnaire is divided into 4 parts:

Part 1: General information about the respondents

Part 2: Education curriculum and training courses conducted by the government

Part 3: Participation in activities by public-private partnerships

Part 4: Suggestions and recommendations

**Questionnaire: Cooperation between the Public and Private Sectors for
Providing Workforces and Development of Labor Efficiency
in the Industry Sector**

Part 1. General information about the respondents

Explanation: Please mark ✓ in the appropriate box ☐

1. Sex

☐ Male

☐ Female

2. Age (Years)

☐ 25-30

☐ 31-35

☐ 36-40

☐ 41-45

☐ 46 up

3. Education level

☐ Below Undergraduate

☐ Graduate

☐ Master's Degree

☐ Ph.D. Degree

4. Years of service

☐ Less than 1 year

☐ 1-5 years

☐ 6-10 years

☐ 11-15 years

☐ 16-20 years

☐ 20 years or more

[illegible]

[illegible]

[illegible]

No	Activities by public-private partnerships	Curriculum									
		Vocational/ Diploma					Undergraduate				
		Level of comment					Level of comment				
Cooperation with organization curriculum (cont.)		5	4	3	2	1	5	4	3	2	1
3.13	Joint training programs in the government sector by the Department of Skills Development and others will increase labor skills more than training courses by the government alone.										
3.14	Participation in a skills test under the Department of Skills Development										
3.15	Competition /skills testing will help to improve labor skills based on new technology.										
3.16	Competition /skills testing will promote the transfer of knowledge and technology between the public and private sectors.										
3.17	Competition / skills testing will transfer knowledge and technology between skilled laborers and those who are still studying.										

Part 4. Suggestions and recommendations

4.1 Curriculum, education and training by the government

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4.2 Cooperative activity between the government and private sectors

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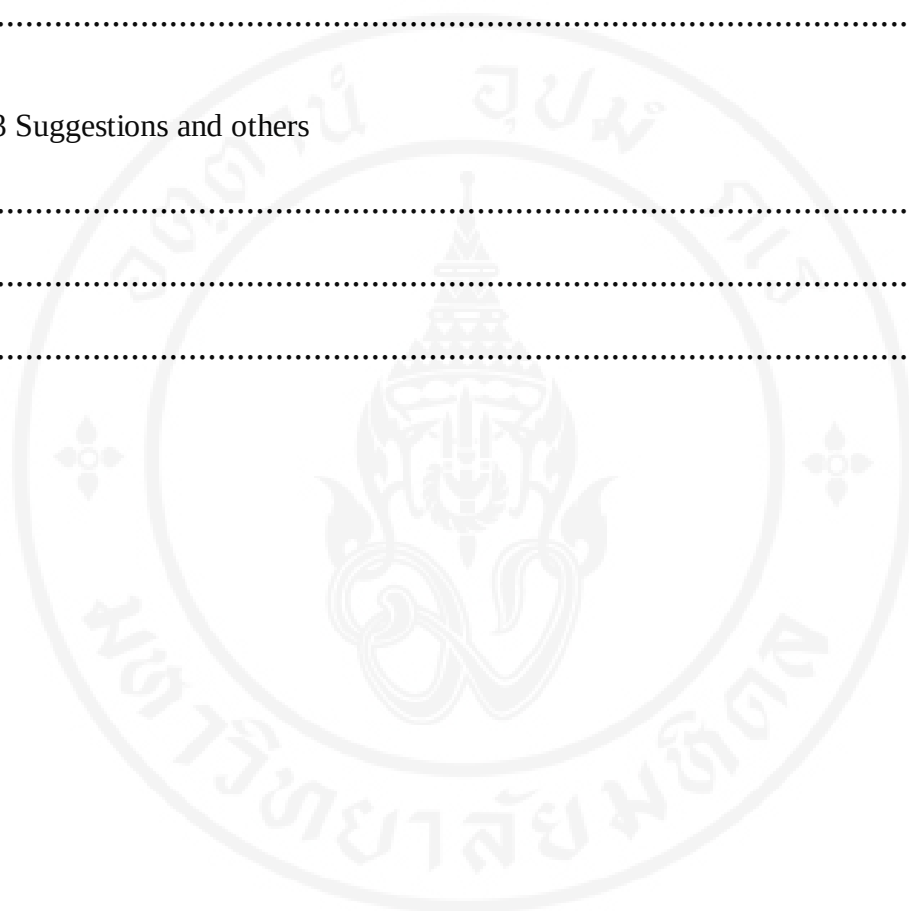
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4.3 Suggestions and others

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Questions for the Focus Group

Discussion #1

Date.....Month.....Year.....

Place.....

The Questions and Issues

As you are a representative of the human resources management for the Federation of Thai Industries and government agencies, can you comment on the following questions?

1. Do the laborers who entered the motorcycle industry have the proper knowledge, skills and attitude in accordance with private sector needs?
2. What is the main point of development for labor productivity in Thailand's motorcycle manufacturing industry?
3. How does the private sector in Thailand develop labor development skills policies?
4. Does the private sector have a policy for labor development in partnership with the public sector? How? What was the result of the cooperation? How will future collaboration improve skilled labor?
5. In the point of view of the private sector, are there solutions to solve the problems of labor efficiency and public-private partnerships? Have opinions varied on the proposal to establish a new institution or organization with cooperation between the public and private sectors?
6. How does the government in Thailand develop curricula for education and labor development?
7. Does the government in Thailand have a policy for labor development in partnership with the private sector? How will future collaboration improve skilled labor?
8. In the point of view of the government, are there solutions to solve the problems of labor efficiency and public-private partnerships? Have opinions varied on the proposal to establish a new institution or organization with cooperation between the public and private sectors?
9. Other suggestions and recommendations

Questions for the Focus Group

Discussion #2

Date.....Month.....Year.....

Place.....

The Questions and Issues

As a representative of the labor union, how would you comment on the following questions?

1. Do the laborers who have entered the motorcycle industry have the proper knowledge, skills and attitude in accordance with private sector needs?
2. What is the main point of development for labor productivity in Thailand's motorcycle manufacturing industry?
3. How does the private sector in Thailand develop labor development skills policies?
4. Does the private sector have a policy for labor development in partnership with the public sector? How? What was the result of the cooperation? How will future collaboration improve skilled labor?
5. In the point of view of the labor union, are there solutions to solve the problems of labor efficiency and public-private partnerships? Have opinions varied on the proposal to establish a new institution or organization with cooperation between the public and private sectors?
6. How does the government in Thailand develop curricula for education and labor development?
7. Does the government in Thailand have a policy for labor development in partnership with the private sector?
8. Other suggestions and recommendations

Questions for the Focus Group

Discussion# 3

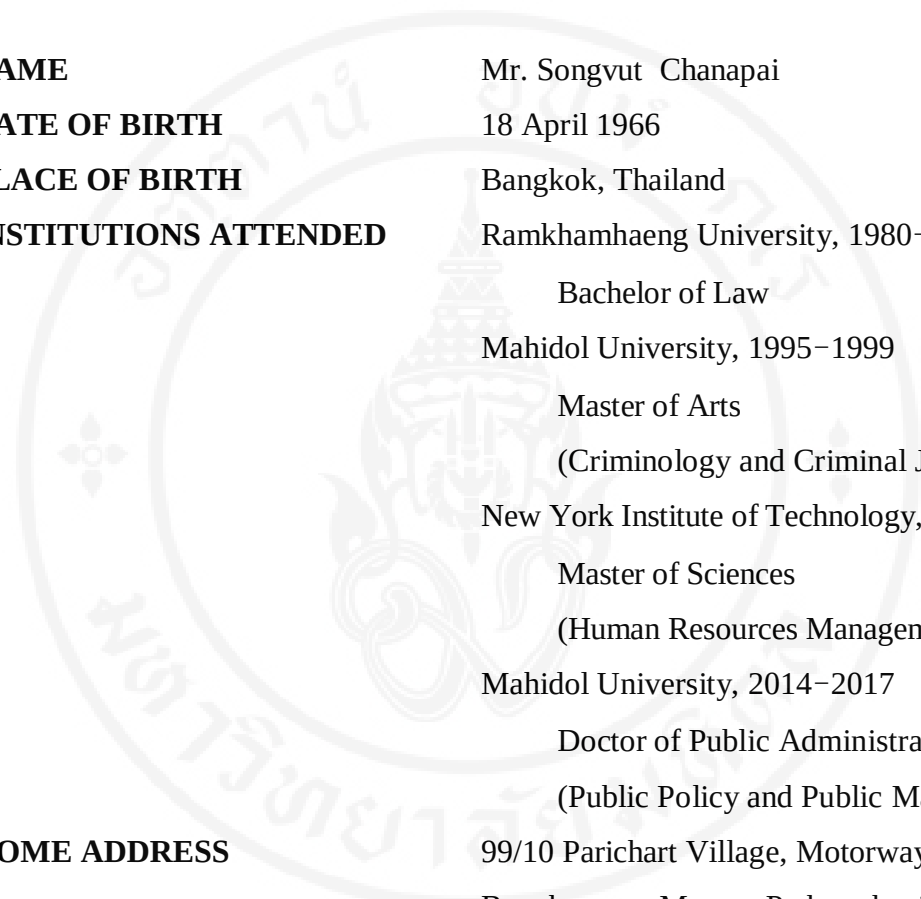
Date.....Month.....Year.....

Place.....

The issues in question

As a representative of human resources management for the Federation of Thai Industries, government agencies and labor union, what comments do you have to the following questions?

1. Have you got any opinions on the proposal to establish a new institution or organization with cooperation between the public and private sectors?
2. Should the appropriate future cooperation model be in accordance with the new paradigm presented in the proposed conclusions?
3. Other suggestions and recommendations

BIOGRAPHY

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