

## CHAPTER 1

### CONTEXT AND GENERAL PROBLEMS

#### 1.1 The State of Industry in Thailand

The industrial sector is important for driving Thailand's economy. A lot of income is derived from this sector by exporting many kinds of goods/products. Most goods/products for export, such as auto and electronics parts/components are produced using modern manufacturing. Foreigners are important investors of this sector (especially Japan, USA, China, and Europe). Thailand is still a most interesting place for them because of sufficient fundamental infrastructure (especially in the industrial estate), good support from the government, and easy access to trade with other countries. However, nowadays, the competition from neighbors to attract foreign investors is affecting Thailand's investment situation. Thai industries cannot attract foreign investors by offering only low labor costs and financial advantages anymore. Therefore, Thailand must focus on developing both technology and personnel support to improve international competitiveness to prevent factory relocation.

##### 1.1.1 An Industrial Overview of Thailand

In 2009, January – October, Thailand exported goods/products totaling 124,113.9 million US dollars. The industrial sector portion was 95,127.3 million US dollars or 76.65% (The office of industrial economics, 2009a).

The top ten ranked export goods/products are illustrated in table 1.1. Most of the products were produced by modern manufacturing (Hi-tech industry) such as computer parts and component, car/auto parts and components, electronic circuits, petroleum products, chemical products etc. Also, some agricultural products from Low-tech industry (rice, rubber) were exported, but to a lesser extent.

**Table 1.1** The top ten ranked export goods/products of Thailand

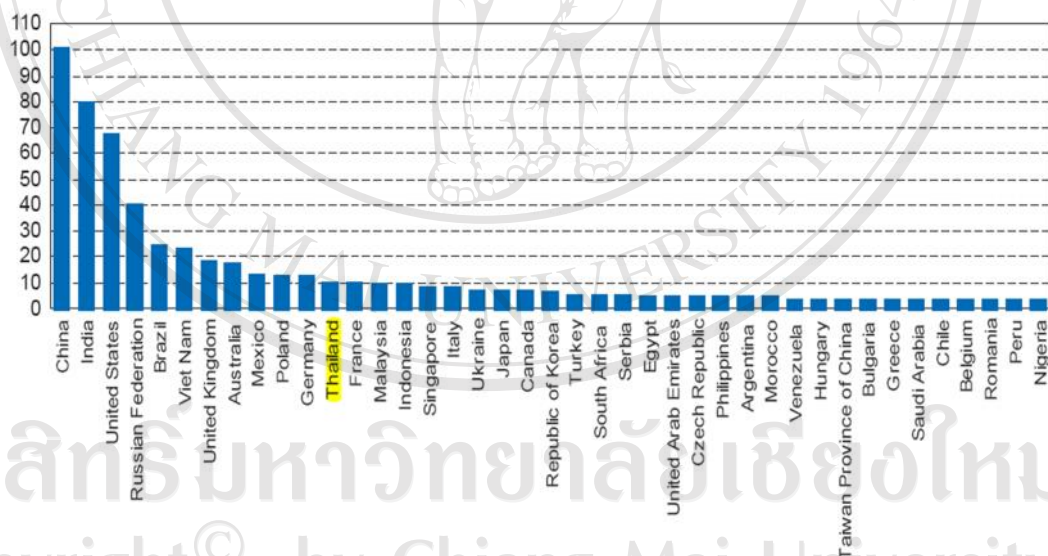
Rank	Products	Values (Million US dollars)
1	Computer, parts and components	12,822.5
2	Car, auto parts and components	8,780.3
3	Jewelry and accessories	8,774.8
4	Electrical circuits	5,213.6
5	Petroleum products	4,381.2
6	Rice	4,179.4
7	Iron, steel and products	4,080.3
8	Plastic	3,649.0
9	Chemical products	3,603.3
10	Rubber products	3,588.5

Source: The office of industrial economics, 2009a

In the industrial sector, especially in modern manufacturing, foreign investors are important to increase the industrial growth rate. The latest number of projects and investments are still high but there have been slight decreases in the last couple of years due to world economic problems. The Thailand Board of Investment (BOI) reported that there were 905 foreign investor projects worth 260,100 million baht (approximately 8,670 million US dollars). The largest investments came from Japan with 222 projects worth 52,825 million baht (approximately 1,760 million US dollars) followed by the United States with 36 projects worth 25,417 million baht (approximately 847 million US dollars) and China with 14 projects worth 6,969 million baht (approximately 232 million US dollars). Investor countries from Europe include Switzerland, Italy, England, German, France and Belgium. This group invested in 76 projects as 8,893 million baht (approximately 296 million US dollars) (The office of industrial economic, 2009a). This shows that Thailand has the potential to attract foreign investors.

A survey by the Japan External Trade Organization (JETRO) about Japanese-affiliated manufacturers operating in six ASEAN countries (Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam) and India revealed that Thailand ranked highest as the most optimal location for establishing a production/sales base in the coming five to ten years; Vietnam, India and China (in that order) were other top locations (JETRO, 2006).

In addition, a survey result by UNCTAD (UNCTAD, 2007) also revealed a similar result. The survey studied the outlook for future trends in Foreign Direct Investment (FDI) by the largest Transnational Corporations (TNCs) for the period 2007 to 2009. It was conducted in March – May, 2007 by polling chief executive officers or investor relations offices using a sample of 1,500 of the 5,000 largest TNCs based on foreign assets. 191 responses were received. The result showed that in Asia, Thailand is ranked 4<sup>th</sup> after China, India and Vietnam and 12<sup>th</sup> in the world.



**Figure 1.1** Most attractive economies for the location of foreign direct investment (FDI), 2007–2009.

Source: UNCTAD, 2007, p.30

There are many reasons why investors are interested in Thailand. In the 1970s - 1980s, Thailand had not only cheap labor, but also the economy was market-oriented and the government encouraged foreign investors. Other competitor countries tried to do the same thing, however, at that time, Thailand still had better infrastructure, more efficient business services, more adapted legal framework and a relatively efficient administration (Oudin, 2007). Now, the situation in all parts of the world has changed; there are many factors that impact on an investors' decision making. Investors look for markets with growth potential, size, easy access and availability of skilled low-cost labor (WAIPA, 2008). At present, Thailand is still attractive to foreign investors (BOI, 2009) because:

1. Thailand is the ASIA gateway; a country central in ASIA, with easy access to trade with other countries including China, India and the countries of the Association of Southeast Asian Nations (ASEAN). The population of this group is 500 million.

2. Thailand is one of 10 ASEAN members, and is one of the founding members. It has been instrumental in the formation and development of the ASEAN Free Trade Area (AFTA). Thailand has good collaboration with ASEAN members and supplies products and services to the ASEAN markets.

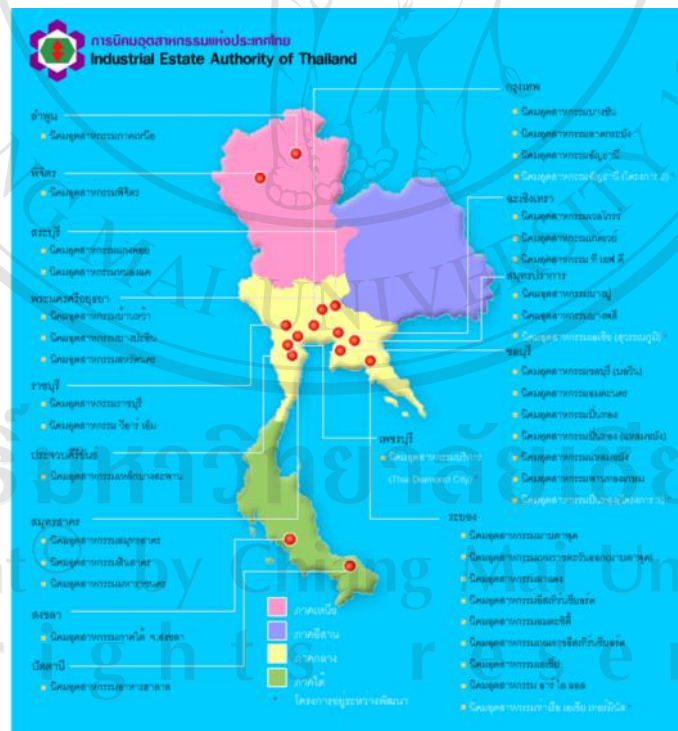
3. Growing economy and sufficient infrastructure; Thailand economy has grown steadily (except the economic crisis in 1997). Abundant natural resources and the availability of land for factories and industries are among the advantages for investors

4. Government support, incentives and the existence of long-established and new industries, also work to attract investment.

Industry in Thailand is distributed around the country. The Industrial Estate Authority of Thailand (IEAT) is a state enterprise which represents all industrial estates in Thailand. IEAT has the responsibility to help investment in construction, public utilities systems, contact with other governments and private organizations, and also environmental management. Investors from foreign countries and even Thai investors prefer to build their factories, especially modern manufacturing, in an

industrial area. There are 39 industrial estates in 14 provinces of Thailand. Most of them are in the middle of Thailand, with a few in the north and south. This is show in figure 1.2.

The type of industrial estate in different areas varies according to the kind of industrial process and products produced. The Eastern region industrial estate focuses on petro-chemical products such as petroleum, plastics and natural gas because of nearby raw material. In the middle area of the country, the estates have many kinds of products and production such as cars, car parts, electronic parts and devices, metallic goods, leather, consumer products etc. due to easy access to raw materials, the workforce and logistics. In the northern region industrial estate (Lumphun), the majority of products are electronic parts, machinery parts, food products, jewelry and others (The Northern Region Industrial Estate office, 2005). The varieties of products and productions in this area require different knowledge, know-how, technology and a specialized workforce.

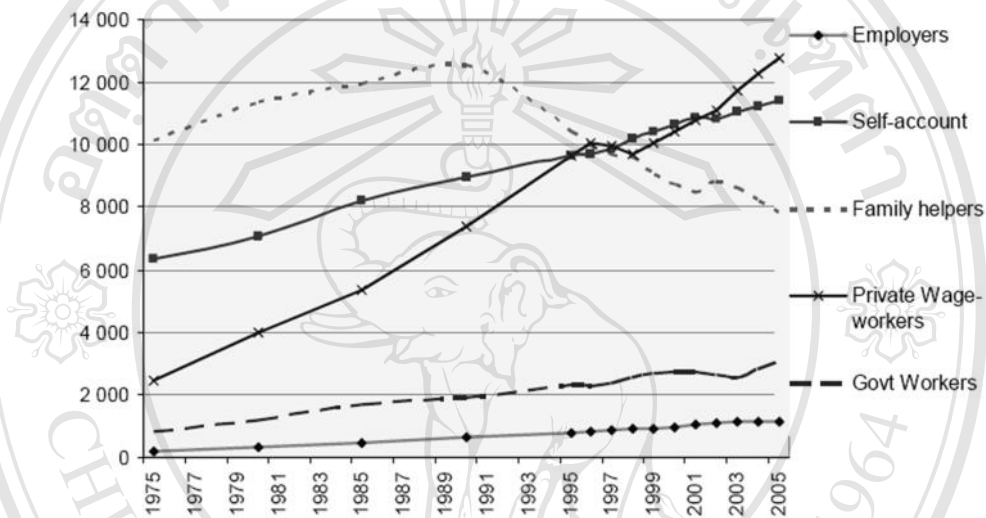


**Figure 1.2** The industrial estate in Thailand  
(In each point represents one or more industrial estate)

Source: <http://www.ieat.go.th/ieat>

### 1.1.2 Thai Industrial Workforce

One consequence of foreign and Thai industrial development is rapid growth of the workforce. Private wage earners have increased from 2.4 million in 1975 to 13 million in 2005 (Oudin, 2007). As a result, the workforce in Thailand plays an important role in driving the economy. Thai workforce trends are illustrated in figure 1.3.



**Figure 1.3** Labour Force by Work status in Thailand, 1975-2005 (in thousands)

Source: Oudin, 2007, p.12

Thai workers in the 1970s to 1980s came from rural areas with less education (primary school). This cohort was worked for low wages and had some assistance such as dormitories and transport. Thai industry, at that time, hired these kinds of workers because most industries did not use high technology in their manufacturing.

When neighboring countries started to compete, the Thai government supported investment in technology to leverage the manufacturing process. New equipment and machines were introduced in various industries. As a result the workforce had to improve their knowledge and skills, especially in modern manufacturing. Only 7% of all jobs occurred in modern manufacturing (Oudin, 2007), and the Thai government is working to improve the situation. The regional industry

development plan project (2009) promoted using knowledge from technologies as an essential component for economic added value (The office of industrial economics, 2009b). In addition, the Ministry of industry found that Thailand had low capability to innovate using technology. Hence, Thailand focused on developing both technology and personnel support to improve international competitiveness.

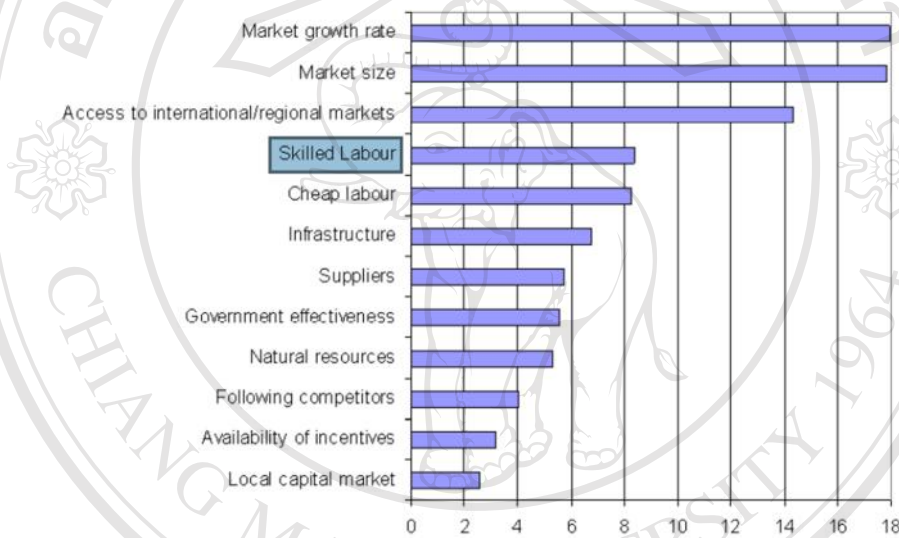
Moreover, presently, the economic, political and social environment is changing very rapidly. Countries can directly contact and connect together easier and this affected competition in the industrial sectors around the world. Many multinational companies have considered relocating their factories to new developing countries. These countries have an available supply of cheap labor (Chakpitak and Tonmukayakul, 2009). The industrial trend in the future will emphasize “Knowledge-Based Industry”. Thus, Thai industry not only focuses on marketing but also emphasizes human resource development to conduct and control new innovation and technology with the goal of increasing productivity and competitiveness (The office of industrial economics, 2009b).

One example is manufacturing companies in the northern industrial estate (Lumphun), which was one focus of this research. In the past (20 years ago), these companies had the advantage of cheap labor costs. Depending on company size they generally hired 100 – 4,000 unskilled labor employees, 1 – 10 engineers, 10 – 100 administrative workers, and paid low wages/salaries. Salaries/wages for these groups increased after working a long time and affected company profits. Because of this they decided to relocate their factories, and if not, they had to increase profits and reduce costs. Consequently, leveraging their human resources became very necessary. To be more competitive the important knowledge and skills that needed to improve were computer applications (IT) and modern management, such as Enterprise Resource Planning (ERP), Supply Chain Management (SCM), Customer Relationship Management (CRM), and Competencies Based Management (CBM) etc.

Hence, to leverage the Thai workforce to be more efficient, the level of workforce basic knowledge is a key issue. Nowadays, the educational level in industry is improving more than in the past. We can see this in modern manufacturing

where new employees with at least upper secondary education (Oudin, 2007) have skills and are more easily trained. The survey (WAIPA, 2008) revealed that skilled labor was considered more essential than cheap labor (see in figure 1.4).

In this situation, educational institutes play an important role in improving the workforce by teaching citizenship, formal rationality and general knowledge. (Jorgensen and Aarkrog, 2008). Vocational and general education (especially secondary school) plays an important role in developing the workforce.



**Figure 1.4** Location criteria in order of importance, 2008-2010

Source: WAIPA, 2008

### 1.1.3 The Educational Context of the Thai Industrial Workforce

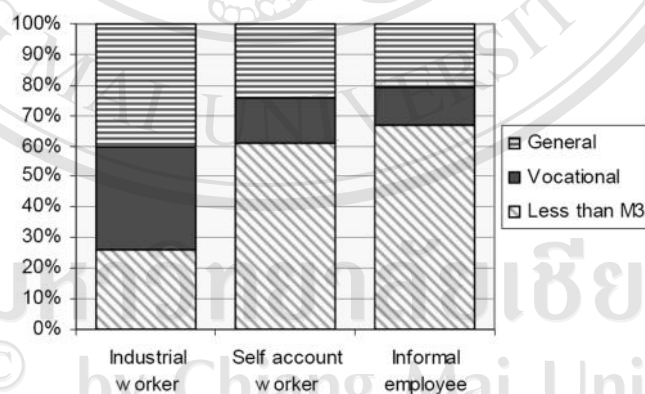
Educational in Thailand can be divided into four levels. They are pre-school, primary school, secondary school, and higher education. In general, Thai people start studying in pre-school around three years old, primary school at six or seven years old and continue for 6 years at this level. Secondary school consists of two parts: students spend three years at lower secondary and three at upper secondary; where they can choose between general or vocational education. Most general students go on to



university, whereas vocational students can further their studies at a higher vocational college (see in figure 1.9).

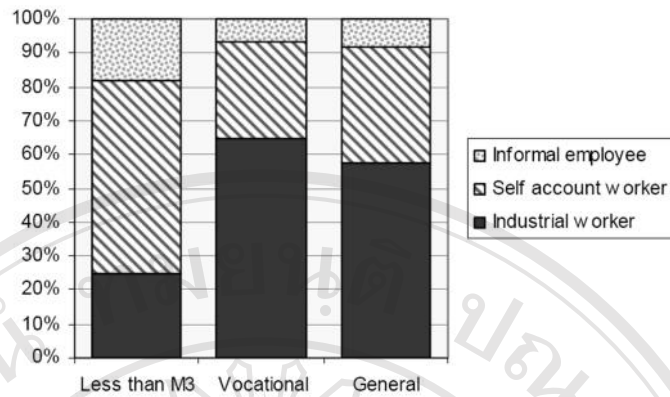
A paper by Oudin (Oudin, 2007) analyzed the effect of education and formation of skills on labor productivity, and hence on the Thai international competitive advantage and on national economic and social development. The data were collected from 3,564 individuals by interviews from 1,543 workers in 84 modern companies, 1,567 self-account (self-employed) or head of family enterprises and 454 employees in these family enterprises.

The result shows that in the three groups of sample workforce (industrial worker, self account worker, and informal employee), more people with vocational training worked as industrial workers compared to self-account workers and informal employees. Similar results occurred with people having general education. In the case of people with less than M3 (grade 8) education the situation was reversed (a small percentage worked in industry and the largest percentage worked as self-account or informal employees). The ratio graph is illustrated in figures 1.5 and 1.6.



**Figure 1.5** Level and stream of education

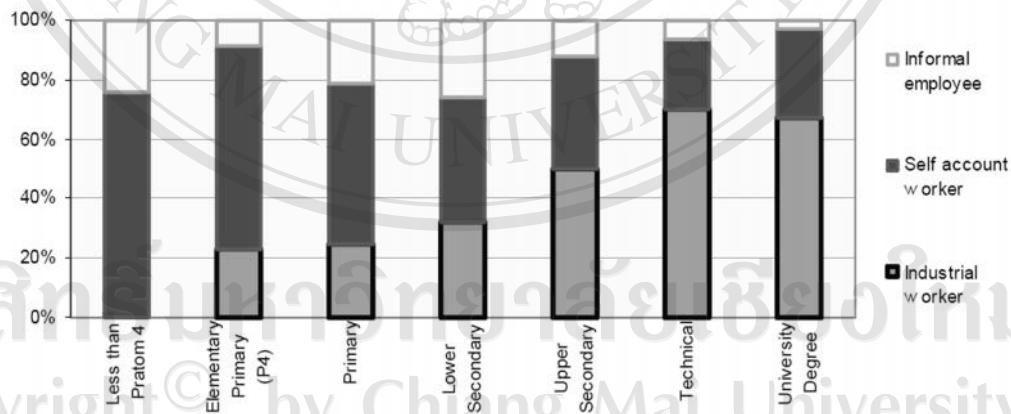
Source: Oudin, 2007, p.36



**Figure 1.6** Level and stream of education distributed by categories of workers

Source: Oudin, 2007, p. 37

This information shows that workers who finished secondary level or equal preferred to work in industrial jobs because of higher wages. As a result, more educated employees' supervisors and mid-level managers also needed to be better educated. Figure 1.7 illustrates that most people who graduated at a higher educational level from both university and Technical (High vocational school / Powoso) preferred to work in the industrial sector.



**Figure 1.7** Distribution of workers at different educational level

Source: Oudin, 2007, p. 32

This situation (workers with higher education) impacted hiring patterns. The graph (figure 1.8) demonstrates the trend.

In the past, it was not necessary to attain a high level of education. Employers hired workers who finished just primary school up to lower secondary school. It was accepted for supervisors to have vocational college or upper secondary school with sufficient experience or upper secondary school with extra experience. Managers needed university level or advanced vocational college with experience. The executive level always came from foreign countries. These positions rotate on a one to four year basis.

The new employee recruitment process involves three main considerations:

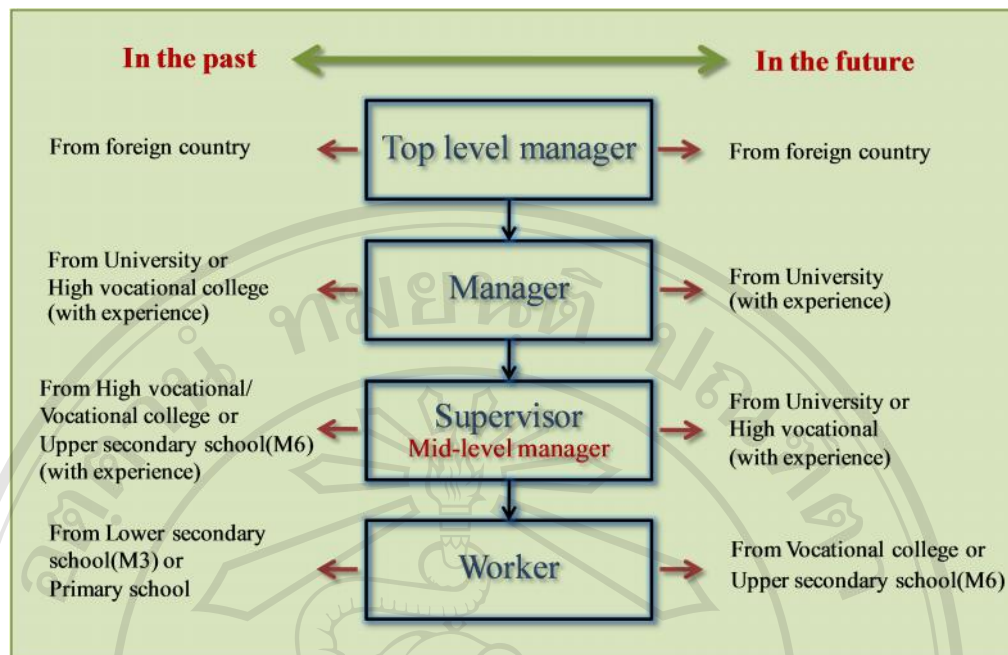
- 1) Candidates are selected by considering their degree and job specifications.
- 2) A paper examination and interview are conducted by Human Resources and/or the relevant department.
- 3) A probation period can involve on the job training or technical training in a foreign country for 3 to 6 months.

After this, permanent employee status can be granted. Promotions depend on time and experience.

Some Japanese companies recruit new employees from vocational college level and send them for study and on the job training in Japan for three to five years.

After completion, they return to Thailand in the position of mid-level manager. They will help to set up the production system, recruit new employees and advise newcomers. They can be promoted to higher positions after sufficient experience and time on the job.

Figure 1.8 illustrates that education requirements at all levels of employment have increased.



**Figure 1.8** The general organization chart of modern manufacturing and the changing employment pattern

Higher educational level requirements and globalization cause factories to relocate to new developing countries with cheaper labor. As a result every organization must speedily develop its human resources in order to survive and grow continually. Some employees can be improved or developed but some take a long time to improve or are unable to develop further. The main reasons for this are educational background and age. A Japanese company in the northern industrial estate Thailand faced this problem. The company realized that employees at manager level who started work with the company twenty years ago needed to improve their knowledge and skill to meet the standard requirements of their consultant company such as modern management, accounting, psychology, etc. The company conducted training courses according to standard requirements for developing managers' abilities. Unfortunately, the training courses were not successful because of many constraints, especially time, background, and lack of interest.

Other companies face this situation. Every organization tries to find an appropriate way to develop their human resources including training, apprenticeship in a foreign country, etc. Some companies encourage employees to study further, but

not many, because they fear employees will resign and move to a new company when they finish their education (Rupavijetra, 2010). Also, employees have time constraints (shift working) and cannot afford the expense of further education. Some companies employ recent graduates with a bachelor's degree that concentrated on the study of contemporary techniques and knowledge. Regrettably, most new graduates lacked work experience and the skill to supervise workers, especially those workers who had industrial experience and now a higher educational level (higher than in the past). Age and experience differences between supervisor and worker can cause difficulties for the supervisor. In this case, the key solution is to train students at the university level who will be mid-level in the future to have enough skills, knowledge and experience to supervise experienced workers. It follows that companies must adjust to a more appropriate recruitment process that uses less time and cost, and is sustainable.

Higher educational institutes, especially universities, are responsible to produce this type of employee. The university must not teach only theory but also encourage the student to have practical experience. However, the balance between theory and practice is very important. The university is not a place that emphasizes technical skill, but cognitive skill. University teaches the student to have in-depth knowledge in their career and the ability to reason and be self-reliant. Technical skills are not part of the university curriculum. This is the challenge of Thailand's educational institutions, i.e. how to balance theory and practice concurrently at the university educational level.

## **1.2 Educational System in Thailand**

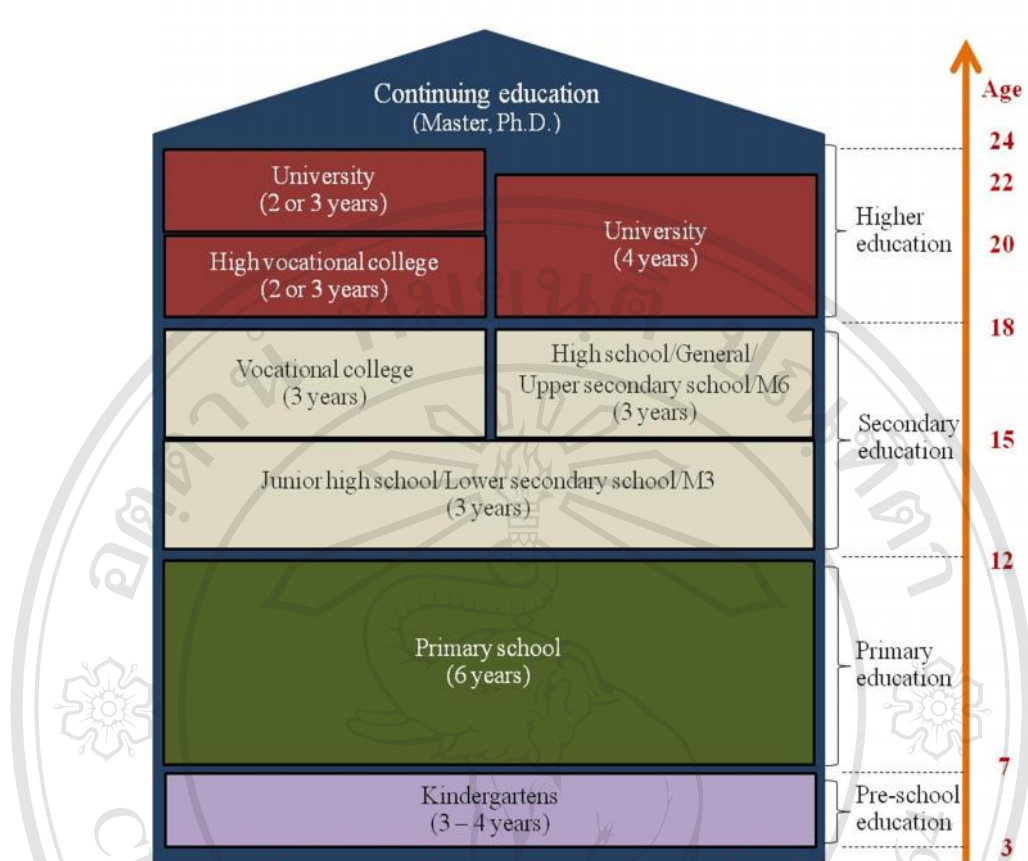
### **1.2.1 History of Thai Education**

Thai education (Tepsumetanon et al., 2004) developed as follows: Lanna and Sukhothai kingdoms (1238 – 1558), Ayutthaya Kingdom (1350 – 1767), Thonburi kingdom (1770 – 1782) until now in Ratanakosin kingdom (1782 – present). In the past, Thailand used temples as educational centers. Monks were the teachers. The subjects for study included Buddhism, reading and writing Thai language,

handicraft, and military strategy. The content changed slightly over time, but not so much until the era King Rama IV of the Ratanakosin kingdom (1851-1868). In the imperialism period, King Rama IV was very interested in new knowledge and technology to help protect Thailand from western countries. He studied and disseminated this new knowledge and technology by himself. Afterwards, in the era of King Rama V (1868-1910), a huge revolution in the Thai educational system occurred. The first “School” was established in 1871 separate from the temple and taught by laypeople (not monks). It had a formal study time, and a variety of subjects such as foreign language so Thai people would be able to work for the government. This revolution established the first “formal education” pattern in Thailand. Subsequently, there was great development in the Thai educational system. Many schools were established and the Ministry of Education was founded in 1892. In 1916, the first university “Chulalongkorn” was set up consisting of four faculties: faculty of Medicine, faculty of Public Administration, faculty of Engineering, and faculty of Arts and Science. This was the starting point of “mass education” that has affected the Thai educational system to date.

Thailand has a “National Education Plan” as a key direction for developing. There have been fourteen plans begun until now. There are some important events that impacted on the Thai educational system as follows. In 1921, the government made a law that all Thai people must study at least three years in primary school (full course was seven years at that time). As a result, the school enrollment rate in Thailand rapidly increased. In 1977, a full course was changed to 6 years and all primary students were required to complete the full program. It was extended to 9 years in 1992 (Michel, 2010). After that, the National education Act of 1999 provided 12 years as basic education for Thai people (Sangnapaboworn, 2003).

At present, Thai educational structure can be separated into 4 major levels; Pre-school, Primary school, Secondary school and Higher education (shown in figure 1.9).



**Figure 1.9** Thai educational structure

The National Education Plan of 1992 (Tepsumetanon et al., 2004) is outlined as follows.

1. Pre-school education; kindergarten or before primary school. Now, parents like to introduce their children to this level when they are 3-4 years old. The teacher prepares children in every area including body, mind, brain, emotion, and so on, so they are ready to proceed to the next level.

2. Primary education; it is compulsory for all Thai people and takes six years to complete. This level emphasizes educating the student to have basic knowledge and abilities to read, write and calculate and also to have good characteristics such as morals and ethics to be a good citizen.

3. Secondary education; this level separates into lower and upper secondary school.

3.1 Lower secondary school or Junior high school or Mathayom 3 (Thai); stresses student development of knowledge, abilities and also morals and ethics continued from primary education. This helps the student to decide whether to follow an academic or career path. Lower secondary level is compulsory for all Thai people and takes 3 years to complete. After finishing this level, students have 2 ways to proceed. First, general education, and second, vocational education.

3.2 Upper secondary school; this level prepares the student for higher education. It also encourages students to gain sufficient knowledge and abilities to work in their career employment or self-employment, and also to develop morals, ethics and social skills. This education level takes 3 years of study. There are two types of educational patterns at this level:

- General education; is normal education that emphasizes theory more than practice (usually classroom study).
- Vocational education; it involves classroom studies and practical technical skills in a workshop environment.

Rupavijetra (Rupavijetra, 2010) used the systematic approach of Hager and Hyland to distinguish general and vocational education as illustrated in table 1.2. The table revealed that most persons who finished general education prefer to work as managers, engineers and professionals, while those with vocational education often work as skilled workers.

4. Higher education; involves a choice of higher vocational college or university studies.

4.1 Higher vocational college; this level encourages students to develop knowledge and career skills for mid-level jobs or self-employment. Most students who finish vocational college will continue this learning pattern. The main institutes in Thailand that follow this format are Rajamangala University of Technology and general private vocational colleges or institutes.



**Table 1.2** A comparison between General and Vocational education

Areas	General education	Vocational education
<i>Institutional setting</i>	Education delivered only in the classroom at school.	Education delivered alternately in the classroom and the workshop (or workplace).
	Long duration of studies.	Short duration of studies.
	Teachers with theoretical and disciplinary skills	Teachers with practical and technical skills.
<i>Didactics</i>	Didactics based on a large array of disciplines arranged in a sequence to facilitate the learning process (curriculum) and on pedagogy that fits this sequence (theoretical approach, reasoning, capacity of understanding, giving meanings, scholarship).	Didactics based on a large array of disciplines arranged in a sequence to facilitate the learning process (curriculum) and an attempt to adapt the curriculum to a pedagogy that alternates between theory and practice.
	Learning by learning.	Learning by doing.
	Input: “intellectual” materials (books, article, lectures).	Input: work equipment, tools and machines.
<i>Output: Nature of expected knowledge and acquired</i>	Ability to learn without tutor; general and “declarative” knowledge: understanding meanings using different systems of symbols and representations.	Ability to do tasks without tutor; specialized and “procedural” knowledge: know-how.
	Motivation for study: upward mobility.	Motivation for study: acquiring skills in preparation for a particular vocation.

**Table 1.2** (continued)

Areas	General education	Vocational education
<i>Sociological characteristics</i>	Origin of students: middle and upper classes.	Origin of students: working classes engaged in small crafts and trades.
	Studies undertaken with a view to getting highly regarded social positions and well-paid jobs ( <b>managers, engineers, professionals</b> ).	Studies undertaken with a view to getting skilled jobs ( <b>skilled workers</b> ).

Source: Rupavijetra, 2010

4.2 University; is the level that emphasizes developing the student's knowledge and abilities at a high level. The student must be able to adapt theory into practice, develop academic and career skills, be more creative, and learn how to teach others. In addition, the student should participate in helping to develop the country economically, socially, politically, and promote the country's role as a member of the world's nations. Most students who follow this learning pattern come from general school. The main institutes that follow this format are universities, both government and private.

After graduation the student can follow a master's and then a Ph.D. program; this educational level focuses on helping the learner to develop more specific knowledge and skills, experiment, and do research related to their field.

### 1.2.2 What are the Educational Problems for the Thai Industrial Workforce?

The industrial sector has an important role to drive the economy in Thailand. Employee knowledge, abilities and skills are very essential in industrial work. The impact of globalization forces Thai industry to develop human resources to be able to

work at the international level. However, there are many problems that occurred with the human resources development in the industrial sector, including:

1) Most new graduates from university were unprepared for work and lacked sufficient experience when they began their first job. This issue will be described in depth in the next section.

2) The regular internship system could not train students to have sufficient work skills. Most Thai universities usually use the internship system that sends students into the workplace within a short period (2-3 months). In practice, students understand and can work on just basic jobs/tasks. They did not have opportunities to gain sufficient experience because companies still saw them as outsiders that would leave soon. As a result students only gained some superficial work experience.

3) Because of the effects of globalization, most organizations must develop themselves to be more competitive. One alternative to increase their competitiveness is to computerize their organizations/processes. In addition, the knowledge of modern management concepts was also necessary to increase their potential. One major problem was that most of their employees still required knowledge and skills to make this happen.

4) The shortage of engineers and computer scientists in manufacturing was an obstacle for industry to develop computerization. This situation occurred within the northern industrial estate (Lumphun). The main reason was that most new graduates (especially engineering graduates from Chiang Mai University) preferred to work in the middle and eastern regions of Thailand because of job opportunities and higher salaries. Also, computer science graduates were not interested to work in manufacturing. Most of them decided to work with business companies and other government organizations.

5) Most companies in industrial estates are foreign investors. This group of companies produces and exports their products to their mother companies and customers in other countries. Thus, essential knowledge and know-how are important for understanding the norms and standards needed to trade with those countries. This also is one constraint of Thai employees. Foreign investors needed personnel who

know how to work with foreigners and understand the norms and standards. Many employees were not prepared for this.

### **In-Depth Detail of New Graduate Students' Problems**

Considering the above problems, new graduate students from university lacking the necessary competencies for work was a big problem both in the short and long term. Hence the educational institutes responsible urgently needed to find a methodology to produce new graduates with higher potential in knowledge, skills, experience, and who could work competently when they start their job.

Competency refers to a group of behaviors that enable a person to perform at a superior level. This group of behaviors consists of motives, traits, skills, knowledge and attitude. Many sectors, including the government sector, private company sector, industrial sector, etc. have preferred to use the competency concept to develop their human resources for several years. The educational sector has also begun to use this concept in developing students. Rouvrais et al. (2006) describes “Nowadays higher educational institutions increasingly focus on competencies, which impacts on educational objectives and subsequently pedagogical and instructional methods.” Even developed countries such as Germany are interested in using competency as a method to develop student potential at higher educational levels (Barth et al., 2007). More about competency will be discussed in chapter 2.

In Thailand, the educational problem is also related to competency. The new graduate often has insufficient competency and does not meet the requirements of the employer. Research by the Office of the Education Council, Ministry of Education, Thailand (Sangnapaboworn, 2003) reported that Thai higher education places “...too much emphasis on memorization and content, which do not relate to the real situation, labor demand and the development policy of the country”, and also found that “students are not sufficiently cultivated with necessary skills for self-learning, critical thinking, problem solving and creative ability”. The main reason is that the teaching pattern in the past emphasized mainly memorization. This teaching method continues to be widely used even though various governments have tried to make changes.

Research by Tangchuang (2006) interviewed employee and executive levels in 73 companies of 5 regions in Thailand and also a group of people in self-employed occupations. The samples included 400 persons at the executive level and 3,500 persons at the employee level. The objective was to study real situations involving workforce potential and employment and use the results to upgrade workforce skills and efficiency. One result of the research showed that new university graduates lacked sufficient work skills. The research explained that the reason why new graduates had low potential to work was because they lacked cognitive skills (knowledge, skill and creativity). They also did not have enough patience, loyalty, and responsibility, but wanted a high salary and comfortable job. As a result they were unable to learn and develop themselves to fit in their job. Consequently, most employers prefer to recruit experienced persons or new graduate from some institute that emphasized a practical approach or persons who lacked advanced degree but had the focus and ability to adapt in their organization. Other research (Janchai et al., 2009) yielded similar results. Human resources managers and assistants from eight companies from the industrial estate (Lumphun province, northern part of Thailand) were interviewed about the new graduate problem, and this revealed that the major problem was the recent graduates' lack of competencies required to work in an industrial environment. The key competencies are patience, enthusiasm and willingness to learn, analytic and synthetic skill. Thus companies prefer employing vocational graduates rather than university graduates. In so doing, they decrease the chances of employment of university students in the long run.

We can see that other than the problem of knowledge and skill, the big problems are the behavior and mental attitude of new graduates. The reasons may come from many causes such as family background, educational background, and life environment which never involved work experience (only classroom study). Therefore they lack job awareness, do not plan for the future, and have trouble adapting when faced with the pressures and problems of real work. Thus classroom study is not enough. They need to have sufficient work experience to conduct and supervise their job. They need practical experience to deal with real work situation. Consequently, students need to change their behavior and mental attitude because the

changing environment has resulted in behavioral competencies becoming crucial as the greatest determinant of an individual's performance (Vathanophas and Thai-ngam, 2007).

Changes in employment requirements and the problems that occurred with the Thai education system are forcing Thailand to develop new ways for teaching and learning in Thai higher education. Nowadays, many parts of the world such as Europe, America, Australia, and Asia emphasize that students must have both theory knowledge and practical experience before they graduate. One of the concepts used widely is "Cooperative Education", where the student works in a company alternating with study in the university (to be explained further in chapter 2). Although work experience is important, theoretical knowledge is also still very essential. Hence, the educational institute that uses cooperative education or other types of experiential learning to enhance student work skills and experience should be careful to design the curriculum to balance between theory and practice.

### **1.3 Research Objectives**

1. Create a cooperative education model to develop the student's behavioral (mastery and mental focus) and work competencies within the context of the international industrial estate in Thailand.
2. Use this cooperative education model to study the competency development of undergraduate students within the specified context.

### **1.4 Research Questions**

1. What are the necessary competencies for undergraduate students relative to the international industrial estate?
2. How to create an appropriate cooperative education model for undergraduate students within that context?
3. How cooperative education helps students to develop their necessary competencies within that context?
4. How to perpetuate the quality of the competency levels attained?

### 1.5 Organization of the Thesis

This study consists of five chapters. The first chapter presents the context and general problems about the industrial situation and educational system in Thailand, research objectives, and research questions. The second chapter describes a literature review on competency, cooperative education, Activation of the Vocational and Personal Development (ADVP), and Learning Organization theories. Initial studies on new graduates' competencies and the theory used for implementing this research (action research and grounded theory) are also presented in this chapter. In chapter three, the initial conceptual framework of the research, research design and process, and data collection and analysis are explained. The results and analysis of this research are presented in the fourth chapter. The fifth chapter presents the refined conceptual framework, discussion and conclusions of the research.