DEVELOPMENT OF AN eLEARNING MODEL IN SMALL AND MEDIUM ENTERPRISES MANAGEMENT SKILLS FOR THE THAI FOOD INDUSTRY

By
PATARAKIT PHISARNCHANANAN

A Dissertation
Submitted in Partial Fulfillment of the Requirement for the
Degree of Doctor of Philosophy in eLearning Methodology
May 2018

Assumption University of Thailand

Graduate School of eLearning

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Submitted to the Graduate Degree Program in eLearning Methodology,
Graduate School of eLearning, Assumption University of Thailand
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy

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Research Project Title: DEVELOPMENT OF AN eLEARNING MODEL IN SMALL AND MEDIUM ENTERPRISES MANAGEMENT SKILLS FOR THE THAI FOOD INDUSTRY

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ABSTRACT

The objectives of this study were (1) to study the management skills of Thai Food Industry SME entrepreneurs in Thailand, (2) to develop an eLearning model in Small and Medium Enterprise (SME) Management Skills for the Thai Food Industry based on the MONARCHIST model, (3) to investigate the effectiveness of the eLearning model, and (4) to assess the satisfactions of the entrepreneurs towards the utilization of the eLearning model.

In this study, a mixed methods design that integrated qualitative (in-depth interviews) and quantitative (sample survey) approaches were employed. The population consisted of SME entrepreneurs in the food industry, including the starchy foods, meat, ice cream and bakery, snack foods, and sauces and condiments sectors from North, Northeast, Middle, East, West, and South Thailand. A sample of 305 manufacturing SME entrepreneurs was drawn from a population of 1,274 by employing a stratified systematic sampling technique. The data collecting instruments were questionnaires and an eLearning model. Descriptive statistics, paired *t*-tests, chi-square tests and correlation measurement were used to measure the importance of user satisfaction with the components of the eLearning model.

Major findings of the study were as follows:

1) Concerning the model requirements, the entrepreneurs' needs were for accurate financial management to enable access to funding sources, personnel management to improve the strength of the business, knowledge management including sales, purchasing, and production management.

2) The demographic profile of SME entrepreneurs, namely, gender, age, education, business sector, and business size did not have a significant impact on satisfaction and learning outcomes with the eLearning experience at the 0.05 significance level.

3) In the learning process of the learners, the post-learning achievement was higher than the pre-learning at the 0.05 significance level. Additionally, the eLearning model met the 80/80 efficiency criterion.

4) Satisfaction with the eLearning model was found to be satisfactory with the average score of the learners towards the eLearning model being high (4.38 out of 5.00).

These results conclude that the eLearning model was effective and practical for implementation.

Keywords: Web-based learning model, Small and Medium Enterprises, Thai food SME cluster, Management Skills, Monarchist model.

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CHAPTER I

INTRODUCTION

1. Background of the Study

It is widely accepted that having a business, at this time and period of rapidly changing technology and economic regression is a challenge, thus the only way to cope is to stay at the cutting edge by continuously improving and developing one's skills. Technology today has become an essential device for businesses that are large or medium scale in nature, especially in the fields of communication, collaboration and marketing.

The financial crisis in Thailand, in 1997 and globally in 2008, caused the country significant financial hardship. Thailand SMEs were very volatile as large fluctuations can be influenced by several factors, including a lack of knowledge, the ability to manage technology marketing, systematic and professional business management, product design, R & D and packaging development, good corporate governance and energy and environmental conservation (Yu, 2016). At the present time, Thailand is a country with the ability to become the top food exporter in Asia, China, which is the world's largest exporter. It is a major producer and exporter of canned fruits such as canned pineapple, canned pineapple juice, processed chicken, canned seafood, and frozen seafood and a leader in the production of spices, chili paste, soy sauce, oysters sauce, among others. Hence, we can see that Thailand has one of the most versatile food industries in the world. This is actually evidenced by the variety of restaurants in every corner of the country. People from all over the world flocks to Thailand to enjoy a taste of the exotic blend of spices and herbs used to make food that is delicious and unique in flavor (Board of Investment [BOI], 2012a).

This being said, it is nonetheless essential that the country pay particular attention to the industry that supports its economy very well. We also need to take advantage of this demand in order to take the coveted title of being the world's largest food supplier for different food classes.

In an era where anything can be changed from manual inputs to the most advanced technology to enhance learning rapidly, employers and employees are taking advantage of the availability of powerful technological tools to help them in their business and this is where eLearning comes in. With the benefits of both saving time and money to acquire the specific knowledge necessary to hone their skills in their related fields further, especially in management, eLearning has become a powerful business tool.

Data from the Office of Small and Medium-sized Enterprise Promotion (OSMEP) (2005), showed that more than 80% of economic growth takes place due to SMEs that have emerged all over Thailand. Moreover, Patcharin (2009) and Sakolnakorn (2010) discussed the situation of SMEs, Negative factors in business operations were identified as 1) the Thai economy, with particular to investment, confidence, and export capability; 2) the political issues of SMEs concerned with prolonged conflict that affects confidence in tourism and the Thai economy, which may cause consumers to save their money rather than spend it; 3) domestic consumer behavior which affects business due to concerns about political issues and the world economy; and 4) domestic competition as big and multi-national enterprises may have more market share, causing SMEs to perform poorly in the market.

2. Statement of the Problem

The emerging use of technology not only in technical industries but also in all business ventures has revolutionized our way of life. From the simplicity of manual

labor to the intricacies of different software and self-help innovations to aid in the work place, eLearning has become vital in allowing employees to learn the skills necessary to operate these technologies.

Education and time management with its accessibility and flexibility in terms of use and schedule. However, the main concern with the use of the method is its acceptance by the intended parties. To date, there are still organizations questioning the effectiveness of this approach in terms of real learning versus finishing a course and getting a certificate.

Levy and Powell, (2003) showcased the SMEs' internet adoption pattern based on the business owner's recognition of the value of the use of the Internet in learning and the possible business growth. Basically, in any kind of business, projected income from investment is always the major driving factor in the decision-making process, thus the question had always been how effective a certain method will be and how productive it will be in the future.

Thai SMEs comprise 80% of Thailand's industrial production and around 70% of Thai employment (Bunyamanee, 2001), thus it is only important to focus on its continuous stability by making sure that proper government assistance, financially or otherwise is provided. With the Thai Food Industry being one of the biggest industries involving Thai SMEs, it is inevitable for this cluster to take part not only in the competitive market but also in the global one through technical means.

Though eLearning is still not widely used in this particular industry, more and more companies and company owners are now taking the risk and investing in their man power's development, thus the need for a study into its real effects and benefits has become apparent.

With the experience in the business of food ingredient for over 30 years, the present researcher has been able to study the people in this food industry sector, such as the makers of Chinese noodles, sausages, bakery, ice cream, and so on. As the result of these observations, the researcher has found a number of problems with Food Industry Sector SMEs, which are as follows.

There is a lack of Business Management for employees, budgeting, processing, and marketing. Production knowledge is not being passed from generation to generation in the proper way, thus questions always arise about the best way to solve a problem in the processing. No good solutions have arisen for the best ways to deal with their budgeting as well as the marketplace. This is a problem hidden inside organizations with no absolute solution to get to the bottom of it.

Technology has been introduced and become involved in our normal life activities. The researcher would like to use this technology to help business owners to learn and teach their employees the proper way by introducing an eLearning program to them. This will not take up too much time or money, which means that the business owners or their employees could willingly gain knowledge and answers within a short-time. Therefore, business will become even easier when eLearning becomes commonly employed.

A needs assessment survey conducted by the researcher based on in-depth interviews with 30 participants (entrepreneurs from food industry SMEs). The results reveal the problems a effecting SME management in this order: 1) money (96.7%) a result of the financial crises and taking out loans, 2) human resource (HR) management (93.3%), 3) overall business management (90.0%), 4) marketing (86.7%), 5) manufacturing (23.3%), and 6) materials (10.0%).

This study was conducted to test whether learning by the teaching of how to manage a company would result in an improvement. The main objective of this research was to develop an eLearning program in SME Management Skills for the Thai Food Industry based on the MONARCHIST model, which was designed according to the capital letters of words related to business management (M=Money, Management, Manpower, Marketing, Manufacture, and Material, O=Obligation and Orientation, N=Networking and Need, A=Application, R=Relationships and Recruitment, C=Control, H=How, I=Investigation, S=Satisfaction, and T=Training and Treats).

3. Research Objectives:

1) To study the management skills of Thai Food Industry SME entrepreneurs in Thailand.

2) To develop an eLearning model in SME Management Skills for the Thai Food Industry.

3) To investigate the effectiveness of the eLearning model.

4) To assess the satisfactions of the Thai Food Industry SME entrepreneurs towards the utilization of the eLearning model.

4. Research Questions

1. How are the management skills in the Thai Food Industry SMEs?

2. How is the eLearning model perceived by the difference in demographic characteristics and socioeconomic status of the Thai Food Industry SME entrepreneurs?

3. How does eLearning contribute to the improvement of the management skills of the entrepreneurs?

4. What is the level of satisfaction with eLearning model among the entrepreneurs?

The common null hypotheses are as follows:

5. Hypotheses

H1: There are no differences between the genders on the satisfaction and learning outcomes with the MONARCHIST model.

H2: There are no differences among age groups on the satisfaction and learning outcomes with the MONARCHIST model.

H3: There are no differences among education levels on the satisfaction and learning outcomes with the MONARCHIST model.

H4: There are no differences among business sectors on the satisfaction and learning outcomes with the MONARCHIST model.

H5: There are no differences among business sizes on the satisfaction and learning outcomes with the MONARCHIST model.

H6: There is no difference between the pre-test and post-test mean scores of entrepreneurs' management skills.

H7: There is no association between education level and the topic of major interest.

H8: There is no association between business sector and the topic of major interest.

H9: There is no relationship between the lesson components and overall satisfaction.

H10: There is no relationship between the lesson content and overall satisfaction.

H11: There is no relationship between the teaching system and overall satisfaction.

H12: There is no relationship between the graphics and design and overall satisfaction.

H13 There is no relationship between the interactive design and overall satisfaction.

H14: There is no relationship between internet technical support and overall satisfaction.

6. The Significance of the Study

Business owners are always skeptical of new technology and innovations, thus it is essential to provide documented proof of the effectiveness of certain claims before they opt to make an investment. With the growing competitiveness in different business genres around the world, the researcher thinks that it is essential to review the use of eLearning in different business industries in Thailand, but most particularly in the Food Industry. With this in mind, this research will aid in establishing the benefits of eLearning in the Thai Food Industry Cluster SMEs and this will also serve as a basis for future researchers who wish to determine the reach and effectiveness of certain models in eLearning in different industries and in the development of management skills in general.

7. The Scope of the Research

7.1 The type of Study

The term research and development (R&D) is used in this study, and both qualitative and quantitative research approaches are applied for developing the eLearning model.

7.2 Population and Samples

The research was restricted to Thai Food Industry SMEs across the country from 5 business sectors: starchy foods, meat, ice cream and bakery, snack foods, and sauces and condiments. The samples were drawn from a population of 1,274 SMEs obtained from the Department of Industrial Works (2015).

7.3 Research Instruments

The research instruments used in this study were a questionnaire and an eLearning web-based model. The questionnaire comprised two main parts concerning the needs of 30 Thai Food Industry SME businesses for an eLearning web-based model.

1) The measured opinion of the lessons consisting of Lesson Component, Lesson Content, System of Teaching, Graphics and Design Components, the Interactive Design, and the Technical Aspects of the Internet.

2)The satisfaction evaluation of the eLearning model in Management Skills for the Thai Food Industry Cluster SMEs.

The eLearning web-based program as a learning media and research instrument was based on the MONARCHIST model and consisted of nine chapters, including business management content, exercises, and exams.

7.4 Data Collection

Data collection and analysis using qualitative data can be used as a guideline for the development of quantitative tools to study research problems. In-depth interviews are a useful qualitative data collection technique that can be used for needs assessment of business owners to manage their business. The researcher employed a web survey to validate the model's efficiency, which conducted by carrying out a trial

run with SME entrepreneurs. The tryouts consisted of individual testing, small group testing, and field testing.

7.5 Data Analysis

The researcher analyzed the results of the tryouts to determine the efficiency of the model based on the 80/80 efficiency criterion (Brahmawong, 2013). Descriptive statistics, (frequency, percentage, mean, and standard deviation [SD]) were used to describe the basic features of the data in this study. Additionally, various statistical techniques such as the paired *t*-test, multivariate analysis of variance (MANOVA), the Chi-squared test, and a correlation analysis, were used to test the hypotheses in different forms.

8. Definition of Terms

eLearning: The method of learning using a computer or the Internet as a means of acquiring information, performing educational tasks, and training in cases of skill acquisition.

eLearning Model: The techniques and approaches that are used by the participants in this study during their eLearning course.

Small and Medium Sized Enterprises: Business establishments with a certain number of employees and assets as classified by the Ministry of Industry (2016) in Thailand.

Management Skills: The skills used in running the food industry of Thailand. The skills particularly used in this study are Production, Communication, and Marketing.

Thailand Food Industry Cluster: The industry focused on food processing and production limited to the country of Thailand.

The MONARCHIST model: The basis of the eLearning model in SME management skills for the Thai food industry. The MONARCHIST model was

designed according to the capital letters of words related to business management (M=Money, Management, Manpower, Marketing, Manufacture, and Material, O=Obligation and Orientation, N=Networking and Need, A=Application, R=Relationships and Recruitment, C=Control, H=How, I=Investigation, S=Satisfaction and T=Training and Treats).

9. Research Conceptual Framework

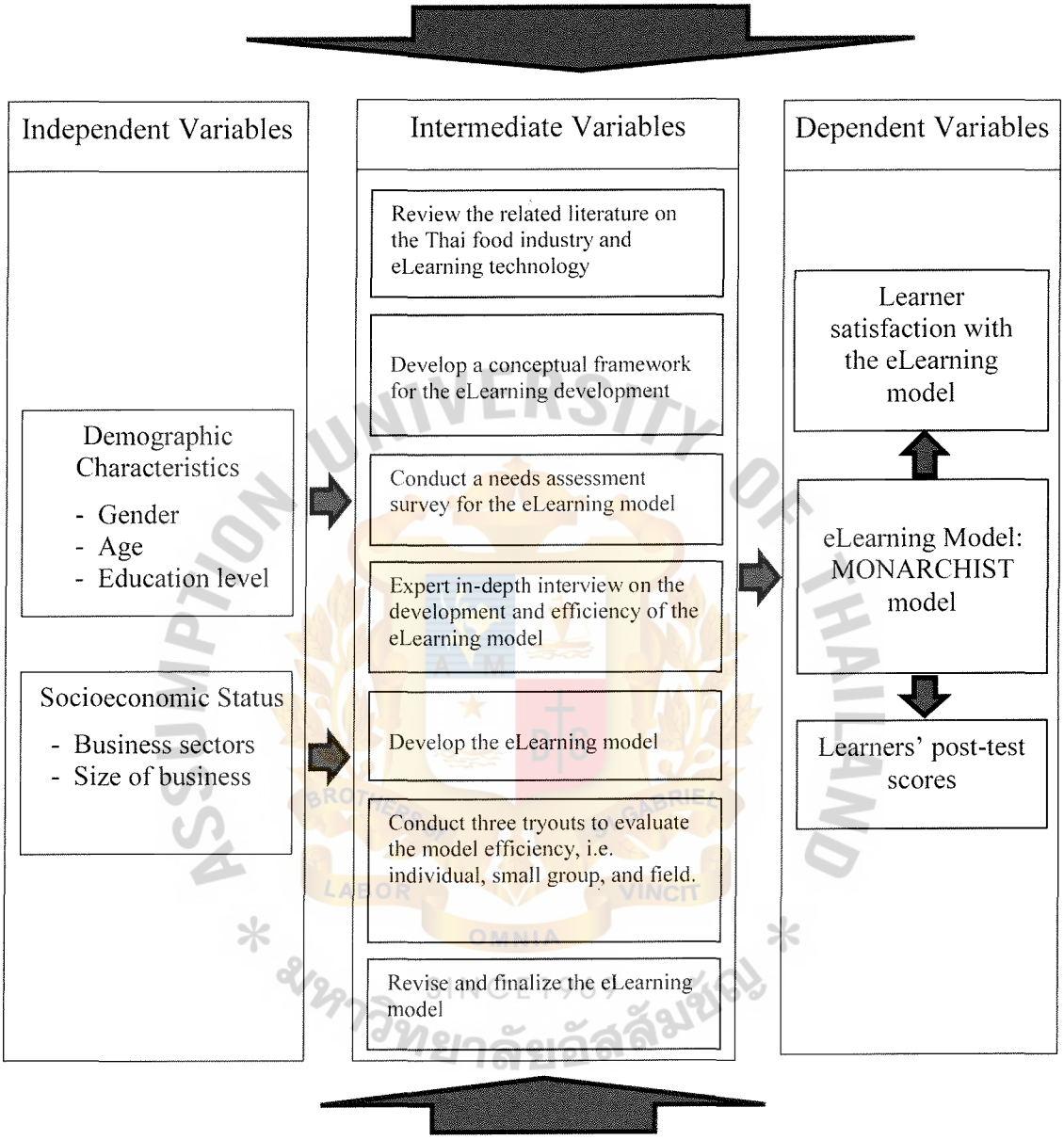
To create the conceptual framework described here, the researcher began by studying the concepts, principles, and theories related to business management for the Thai food industry SMEs and eLearning model development. The knowledge gained from this review of related works was used as guidelines to design and develop the MONARCHIST model. After that, the context of the study, including 5W-1H (Who, What, Where, When, Why, and How) was defined in order to specify the scope of the research.

Thai Food Industry SME entrepreneurs were used as the sample of the study and the experiment was started in the second semester of 2017. A sample of 305 entrepreneurs was drawn from the population of 1,274 in six major regions of Thailand (North, Northeast, Middle, East, West, and South) by employing a stratified systematic sampling technique.

The MONARCHIST model teaches the principles of how to manage an SME in the Thai Food Industry by enhancing management skills in six sectors of management (6M) with a business plan for the Thai Food Industry SME employees to learn.

Concepts Principles and Theories

Thai food industry, Method of eLearning, eLearning technology, Systematization of the potential origins of the problems



Population: Thai Food Industry SMEs, starchy foods, meat, ice cream and bakery, snack foods, sauces and condiments
Teaching method and questionnaires: www.monarchistmodel.net
Year of study: 2017.

Figure 1: Research Conceptual Framework

CHAPTER II

REVIEW OF THE RELATED LITERATURE

1. Introduction to the Thai Food Industry

Thailand has become one of the world's largest and very advanced producers and exporters of processed food products. The combination of the rich agricultural roots and resources together with investment in international quality standards, technology, and R&D for food safety has led Thailand to become the sole net food exporter in Asia and is placed as one of the top five net food exporters in the world (Berendes, 2012).

Exportation by the food industry in Thailand draws about $10 billion each year and contributes up to 28.3% to Thailand's gross domestic product (GDP). Currently, Thailand is the world's largest producer and exporter of processed foods such as canned pineapple, pineapple juice and concentrates, processed chicken, canned and frozen seafood, rice, and frozen and processed shrimp (the South East Asia and Latin American Trade Center, 2014).

Thailand also offers a very competitive workforce in the food industry, which has provided work opportunities for around 600,000 people (Thai National Food Institute [TNFI], 2017).

The food processing industry is vital to the country' s economy as it hires the largest number of workers and has the highest investment value and highest added value (TNFI, 2018).

1.1 SMEs in Thailand

SMEs have had a significant impact on industrial sectors in Thailand since the late 1990's, both entrepreneurially and financially. In 2010, a report conducted by the OSMEP showed that SMEs constituted almost 40% of Thai GDP by value

(Saigosoom, 2013). Positive contributions to the labor market are also important since SMEs generally share more than two-thirds of the total employment in Thailand (Boldbaatar, 2005; Poonpatpibul & Limthammahisorn, 2005). In 2010, almost 80 % of employment in Thailand was provided by SMEs. (Boldbaatar, 2005; OSMEP, 2017).

As proposed by the Ministry of Industry (2016), the official definition of an SME in Thailand uses both the number of employees and the value of total fixed assets (excluding land) as the main considerations. The criteria for these two factors differ among the four business sectors (manufacturing, service, wholesale, and retail) as shown in Table 1.

Table 1: Definition of SMEs in Thailand by Sector, Employees, and Fixed Assets (Excluding Land).

SMEs by sector	Employees		Fixed assets (Excluding land)	
	Small	Medium	Small	Medium
Manufacturing sector	<50	51-200	<50 M Baht	50<M Baht <200
Service sector	<50	51-200	<50 M Baht	50<M Baht <200
Wholesale sector	<25	26-50	<50 M Baht	50<M Baht <100
Retail sector	<15	16-30	<30 M Baht	50<M Baht <60

Source: Adapted from the Ministry of Industry (2016)

SMEs in the manufacturing sector, which is the sector that all Thai food companies belong to possess the highest level of capital investment, and consistently act as the main driver for exports in Thailand (Dhanani & Scholtees, 2002). It should be noted that if the whole manufacturing sector is taken into consideration, more than 90% of the total firms are SMEs (OSMEP, 2006). There are five main industries in the manufacturing sector, namely food and beverages, garments (excluding cloth-related products), clothes, wooden products, and miscellaneous.

From another OSMEP (2011) reported, food and beverages businesses was comprise the largest sector in Thailand, accounting for 52.32%, followed by miscellaneous (23.21%), clothing (10.97%), wooden products (8.44%), and garments (5.06%). This is one of the main reasons why the food industry was chosen as the focus of this study (Saigosoom, 2013).

In 2014, there were 2,736,744 SMEs in Thailand, representing 99.73% of the total registered enterprises. Small-sized enterprises were up to 99.26% of the country's total number of enterprises, while medium-sized enterprises accounted for just 0.47%. Regarding the classification of enterprises by sector, the highest number of SMEs was 1,159,715 enterprises from the wholesale, retail, and automobile repair sectors, equivalent to 99.58% of all of the enterprises in these sectors. Second, there were 1,036,598 SMEs in the service sector, constituting 99.28% of all of the enterprises in this sector. Third, the number of SMEs in the manufacturing sector was 495,077 or 98.57% of all of the firms in the manufacturing sector. Finally, in the agricultural sector, there were 32,081 SMEs or 99.26% of all the companies in the agricultural sector. The number of people employed by enterprises of all sizes totaled 13,078,147 and of this number, SMEs employed 10,501,166 people, or 80.30% of overall employment.

For the employment classification by sector, the service sector had the highest number of employees totaling 4,701,144 or 80.53% for the whole country. Depending on the size of the business, SMEs in the manufacturing sector accounted for 23.09% of total employment while the service sector had the highest employment share of 44.77% of total employment. The proportions of the wholesale and retail sectors add up to 31.57% (OSMEP, 2015).

1.2 The Thai Food Industry Cluster

Since the 1970s, the Thai food industry has moved away from being a traditional producer and exporter of specialty foods, specializing in processed foods for the housing and export markets. Rapid growth has been seen in the food sector with 9,000 food plants present in the country. The government recognizes the potential of the food sector to include the food industry in the group, which is a growth driver of the economy (Intarakumnerd & Leclerk, 2015).

The Food and Agriculture Industry in Thailand not only generates several billion baht a year in economic value, but also is an important part of the Thai way of life which still focuses on agriculture. However, even though Thailand is a major exporter of agricultural and food products due to several factors, one of which is that the exportation of raw materials has more value than processed products, thus reducing the competitiveness of the country (National Science and Technology Development Agency, 2018). The Cluster Development Program is another tool that the Minister of Industry uses to help the industry to develop strength and sustainability. The Food Processing Industry in Bangkok and its vicinity (the Thai Food Industry Cluster) is a group that has been developed and supported, and are a good example of a successful group. The Thai government is aware of the importance of integration in the country's economic development. A group is a concentration of connected food businesses and related businesses working in the same geographic area to increase the investment potential of the country and expand its economic and social development in a region to increase the level of support and cooperation in all aspects of business and strengthen the value chain of the industry.

At the local level, the Cabinet proposed that the Special Economic-Development Zone or the Group's policies became effective on September 16, 2015.

In the initial stage, focus on the development of a policies cluster by the government was aimed at scaling the progress of the groups by targeting two types of development: Super Clusters and other targeted clusters.

1) Super Clusters contains advanced technology-based business segments with which the industry is taking a big investment in the future. Petrochemicals, the Chemicals Group Digital Cluster, the World Food Center, and the World Health Organization are prime examples.

2) Other target clusters include agricultural products, high-tech textiles, and apparel groups (Boi.go.th, 2018).

3) Food Industry SMEs in Thailand

The Food industry refers to the industry that produces products from the agricultural sector, especially livestock and fisheries used as the main raw material. The technology of food processing and food preservation requires machinery used in the food processing and packaging to produce large quantities of food products. Quality, safety, ease of consumption, and extending the shelf life of livestock and fishery products are also of importance (Judkhong, 2018).

In the food processing industry, there are about 8,500 food processing factories classified as small (91%), medium (6%), and large (3%). Food production has a labor force of 870,000 people divided into 11.2% manufacturing and, 60.27% skilled labor force. The cost of production is 84.3% of the total costs and the cost of the labor force is 5%. The domestic market is makes up 88.54% and the export value is 58.73%. Thailand is ranked 12th in the world (Ngammongkolrat, 2013).

1.3 The Future of the Thai Food Industry

According to World Bank report, the world food industry in 2016 would be valued 3,172,463.63 million US dollars, Thailand is still ranked as 14th food exporter

of the world, (World Bank, 2017). Due to the increase in sugar and livestock, the Consumer Price Index (CPI) of the food industry was forecasted to decrease by 2.42% in 2015, excluding sugar, to 0.71. The slowdown in the domestic economy was caused by bad economic sentiment among consumers. The recovery of the global economy is still unclear, although the growth of China's economy (Thailand's main trading partner) is in decline and illegal labor in the fisheries industry that violates the EU's illegal, unreported, and unregulated fishing (IUU) rules (European Commission, 2015). Hence, in 2017, the food industry was projected to grow slightly by around 0 to 5% and exports to decline are projected to decline by -3 to 0%. Furthermore, product prices increased from the termination of Generalized System of Preferences (GSP) benefits.

In 2014, the Thai food industry continued to suffer a recession (-22.96%) compared to the same period in the previous year, especially due to frozen shrimp, boiled chicken, and rice. These products were affected by the global warming crisis and natural catastrophes, but most importantly, the continued recession of the global economy (Office of Industrial Economics, 2015):

To create opportunity and stability for Thai entrepreneurs in all food industry, the Thailand BOI has recently announced six strategies to promote business as follows (Manawapat, 2015).

1) Promote investment by supporting research and innovation. Fair competition and sustainable growth as well as value creation in agriculture, industry and services. SMEs enhance the competitiveness of the country.

2) Promote energy savings or use renewable energy that is environmentally friendly to drive balanced and sustainable growth.

3) Promote networking by strengthening the group to strengthen investment in line with regional potential.

4) Promoting investment in the southern border provinces by supporting efforts to increase the peace of the area to help develop the domestic economy.

5) Prepare to enter the ASEAN Economic Community (AEC) by creating an economic link with neighboring countries.

6) Enhance the role of Thailand in the global economy by enhancing the competitiveness of Thai businesses by promoting foreign investment.

1.4 Government Support to Thai Food Industry SMEs

The Thai government has officially recognized that (SMEs) have a major role in developing the nation's economy and has made a conscious effort to develop them throughout Thailand (Sirisambahand, 1994).

In 2000, the OSMEP was set up under the Promotion for SMEs Restructuring Act, which coordinated among government agencies to develop SME businesses in a good way to stimulate the economy after the financial crisis in 1997.

The following were the main responsibilities of the office:

1) Create a master plan for SMEs promotion and promotion policy.

2) Come up with an action plan for the promotion of regional/ sectorial SMEs as well as micro and community enterprises.

3) Create an SME information center and become the central organization for the conduct of research and studies on SME related issues, including an early warning system.

4) Develop information systems and networks to support the operations of SMEs.

5) Administer the Venture Capital (VC) Fund for SMEs.

The First SMEs Promotion Plan (2002-2006) was formulated to develop more entrepreneurs and enable SMEs to reach international standards. The plan specifically sought to enhance the efficiency and capacity of SME operators as well as other sectors to create a business environment where SMEs could thrive, to improve market efficiency and competitiveness, and to promote grassroots businesses so that they could play a more prominent role in income distribution and bring prosperity to the provinces (Punyasavatsut, 2008). In this regard, the food industry was among the SME target group to be promoted (Seville & Kusol, 2000).

The Thai government recognizes the importance of food innovation. According to the National News Bureau of Thailand, the Finance Ministry proposed setting up a THB 10 billion (USD 283.8 million) fund to support the Food Innopolis Project at the Thailand Science Park. The aim of this project was to position Thailand as a food innovation hub in the global food industry. According to the Ministry of Science and Technology, the expected availability of resources for the Food Innopolis include 3,000 researchers and 10,000 students in Food Science and Technology, 9,000 food factories, 150 food research laboratories, 20 pilot plants, and 70 universities (BOI, 2016).

Currently, Thailand ranks 13th among the world's largest Halal producers. Halal food exports are now valued at about THB 200 billion (USD 5.7 billion) (NFI, 2017). Furthermore, Thailand is well established as a Halal Centre of Excellence in science and testing with the Halal Standard Institute of Thailand at the Halal Science Centre (2017). For the accounting year of 2016, the Department of Industrial Promotion pinpointed the government's plan to allocate THB 403.8 million (USD 11.5 million) to various organizations in Thailand to carry out projects to develop and enhance even further the potential of Thailand's Halal business.

The government set up a five-year plan (2016-2020) for the Halal business which has a high potential for growth and it is hoped that Thailand will become one of the top five countries in the world to export Halal products and services. The Halal industry, including Halal certification for Thai products and services, has been developed as well as strengthened by more R&D. In addition, products have been developed to a higher standard in the world market and exported under the brand name "Thailand Diamond Halal" (BOI, 2016). However, Thai food based on quality and safety has a clear image, and the popularity of Thai food has grown in Asia. Halal food is offered by Thailand as the fifth largest producer in the world and the number one Halal exporter in ASEAN, where Thai investors are closer to neighboring countries with Muslim populations. As a result, Thai SMEs in the ready-to-eat sector have more opportunities in terms of trade and investment (BOI, 2012b).

In addition, the Thai government has adopted a new model for industrial development to enhance the competitiveness of Thai businesses and to compete in the 21st century. The plan covers five major industries, namely food, agriculture, and biotechnology, and aims to integrate related businesses in the supply chain, food production from upstream agricultural activities, packaging processing, storage, and marketing. This is called "Thailand 4.0", for which the main concept is the transition from "Mass Products" to "Innovative Products" using innovative technology and new methods and a change from "production" to "services" using digital resources as part of the change (Parinyasiri, 2017). Moreover, the government's first SME promotion policy is focused on three main issues: investment promotion, financial assistance, and technical and management consultancy (OSMEP, 2015).

Another role in assisting SMEs in financing, business planning, and business advice is the SME Business Promotion Act, a measure of technical and advisory

services. Managing the New Entrepreneurship Program (NEC) under the Ministry of Industry in 2002 is another project aimed at encouraging people to build their own businesses. With SME consulting and training to solve problems and develop business under the NEC as well as fund accessing advice, the plan led to a gross increase of 226,757 new entrepreneurs, or on average 44,550 per year during the plan (Punyasavatsut, 2008).

In line with the current SME policy, there is a vision to help SMEs grow steadily and sustainably in terms of knowledge and skills. The first plan is to achieve the third economic goal by increasing the share of SMEs in GDP to 42%. SMEs have a substantial proportion of the total exports, which increases by an average of 3% per year. The total factor of SMEs including minimum labor productivity of 5% per year growth. The second plan is aimed at some sectors such as automotive and electronics, software, logistics, health care, tourism, related industries, health, food, and rubber products. Those factors involved in the production of SMEs include: a) product quality improvement, b) regional and local business incubator establishment, c) exhibition, d) improvement of distribution channels or distribution, and f) establishment of industry and networking (Punyasavatsut, 2008).

1.5 The AEC and Its Effect on Thai Food Industry SMEs

The launch of the AEC in 2015 helped boost Thai food exports. According to the National Food Institute on the export of Thai food in 2012 the total amount of exported products came to 1 trillion baht, up from 965 billion baht in 2011, of which 10 ASEAN members were exporters of food products. As the largest exporter accounting for 20.6% of all products followed by Japan 14.6% and the United States 12.8%, Thailand is expected to absorb up to 30% of its exports by combining the AEC market with a reduction in tariffs on trade between ASEAN countries. This is in

line with the growing number of new project, as the Thai food industry is expected to see a greater flow of goods and services under the AEC (BOI, 2012a).

1.6 Thai Food Industry in AEC

Globalization, the free trade agreement and the establishment of the AEC in 2015 stimulated the internal relationship among ASEAN nations, resulting in the creation of commercial advantage that includes investment and the free movement of production factors and labor. On the other hand, the SMEs have been exposed to competitors that are even more aggressive and the overflow of products onto the market (Kawai & Naknoi, 2015).

Nevertheless, the opening of the AEC is an opportunity for Thai food industry operators. It will expand the market and investment into ASEAN countries, thus ensuring the overall economic growth of Thailand since the population in each country has high purchasing power.

The AEC is an important factor in promoting the Thai food industry to increase its export value. As this is also the case in the food industry, especially in the food sector, the Thai Food Industry SMEs need to adapt accordingly. The development of food product standards is internationally accepted by using value-added technology in the production process, as well as the study of market demand in each country.

Entry into the AEC has introduced standardization within ASEAN for ASEAN Good Agricultural Practices and ASEAN Good Agricultural Practices (GAP) standard used as for production, harvesting, and handling produce after harvesting. In addition, Thai Food Industry has been working to improve the quality of fresh fruit and vegetables produced for the ASEAN market to ensure safety in consumption. The ASEAN GAP standard consists of four constructs:

1) Food safety involves the prevention of contamination in fresh fruit and vegetables.

2) Environmental management deals with hazards that negatively affect the environment.

3) Welfare and Health and Safety avoid hazards to protect the health of the workers.

4) Produce quality is a quality management plan for harvesting and post-harvest management.

Asia is moving toward becoming the center for Halal food. The world's population of 2 billion Muslims with a Halal value of more than 70 trillion baht is an attractive market for food manufacturers both in Thailand and in other ASEAN members such as Malaysia, Singapore, and Indonesia. It is an economic group with more than 400 million Muslims or almost a quarter of the world Muslim population. ASEAN is the focus of competition for Halal food production, but from the opinions of academics and those involved in the Halal food industry in Thailand, ASEAN will have the characteristics of being a competitor and a parallel partner. Due to the size of the Halal food market in the large member nations and the source of skilled labor and raw materials for Halal food production, it is believed that the ASEAN member nations will become more cooperative in developing Halal food products as well as the greater free movement of imports (Ministry of Industry, 2016).

2. An Introduction to eLearning

eLearning is an alternative to face-to-face training that can be done at a convenient time and place for learners and employers, while instructors can be experts located around the world. This is more convenient than traditional training for

which the instructors and learners must live in close proximity in the training room, but the cost of providing such training is often prohibited because the students need to spend time away from their workplaces and often includes travel and accommodation costs (Cousins, 2008).

The Higher Education Funding Council (England) (2005) defined eLearning as flexible learning through the use of information and communication technology (ICT) as tools for delivering information to support students and improve learning management between individuals and groups. As well as the new technologies, new facilities are also available to take advantage of distance learning (Thompson, 1967). The tendency to integrate online features with campus classroom-based learning is increasing as a result of familiarity with online education as well as the continued use of the Internet in everyday life through online interaction.

Bended learning is a highly developed learning paradigm since higher education students are more connected to online communication and have a greater understanding of computer. In addition, eLearning, also refers to Internet access for teaching and communicating with teachers and fellow learning colleagues with telecommunication technology and skills using computer hardware and software. Moreover, Garrison and Anderson (2003) mentioned that eLearning is a complete technical system for social and decision-making management with curricula designed not just for a computer system but so for learners to study anywhere, even in the kitchen (Zucker, Kozma, & Dede, 2003). They considered that eLearning offers university-level courses combined with extracurricular ones as well and includes structured formal programs. Moreover, access to an eLearning system means learning, teaching, and communicating online through computer-based applications (Haythornthwaite & Andrews, 2007).

Saekow and Samson (2011) concluded that the key elements for any business are the ability to exist and make a profit in today's competitive market by having access to the skills to execute a business strategy. eLearning for business comprises six components:

1) Business readiness in a highly competitive environment and being mindful of the environmental issues within an organization, it refers to the link between the organization's business priorities and the learning organization's efforts, which will affect survival and growth for profitability.

2) Technology availability focuses on technical infrastructure. Educational content is prepared in such a way as to be interactive and reusable.

3) Training process readiness means the preparation of the training, which is the ability of organizations to organize, analyze, design, develop, and evaluate rigorous training programs.

4) Cultural readiness specifies that recognizing the use of eLearning is a cultural parameter of an organization.

5) HR readiness means the availability and installation of human assistance systems, some parameters are set, such openness to the perception and prerequisites of human learning to succeed in a new environment.

6) Financial readiness means that effective eLearning is required to allocate budget and to investment in operations.

2.1 The Historical Development of eLearning

At the present time, eLearning may not be much different from previous distance learning approaches. The source of eLearning is the ability to trace back to the original format of the course and being interactive, it can even provide access to higher learning in remote and rural areas (Banas & Emory, 1998). Distance education

programs have evolved in the form of increased communication over the years following the rise of computer technology (Huynh, Umesh & Valacich, 2003).

Based on the economy, the demand for knowledge and new approaches to education has grown steadily over the year with innovative ways of providing education and has led to dramatic changes in learning technology and organizations. Moreover, people want to attain further knowledge and skills, albeit in a time efficient way, and the progress of computer technology and networking for eLearning is continuously improving the experience with a variety of ways in a more personalized, flexible, portable, and on-demand manner. Dramatic changes in demand and learning technology has led to the development of modern learning tools via the Internet, now referred to as eLearning. At times, these changes have resulted in strategic decisions regarding the adoption of the technique. eLearning on corporate self-identity, government organizations, and institutions must keep pace with the eLearning phenomenon (Zhang, Zhao, Zhou, & Nunamarket, 2004). Moreover, education is more likely to be adapted to integrated learning services incorporating computer-aided learning in the classroom (Kumar & Bhatele, 2012).

Cousins (2008) referred to the typical design of an eLearning lesson as to deliver information or to help learners perform specific tasks. eLearning content is used to communicate data from the data provider to the data recipient. These are called advertising programs, including published content, presentations, biographies, and/or facts. The product content based on those data does not entail any specific skills to learn whereas programs designed to create specific skills are classified as content execution programs.

Computer based learning (CBL) refers to the use of computers in education is a major component even when referring to their use in the classroom. It also includes

learning in a structured manner where computers are used for teaching. Since it often uses computer games and web browsing, this concept is viewed as different from using a computer in a learning style but at least having experience of it as a peripheral component.

Computer-based training (CBT) services are performed on-site. By using special training programs on computers that are about their profession, they have been found to be especially effective for training computer users. CBT can be used in conjunction with an application, so students can use it as they learn. In the past, the growth of CBT has hindered personnel to create programs and hardware resources, but due to the increase in personal computer power, and especially the increasing ubiquity of computers equipped with CD-ROMs, CBT is a good choice for organizations and individuals. There are many PC applications that come with. CBT to provide information often referred to as a tutorial.

Web-based training (WBT) is similar to CBT but it is managed through the Internet using a web browser. There is often interaction in WBT via forum chat rooms, instant messaging, video conferencing, etc. Web-based training is often used for self-learning, although some allow online testing and evaluation at certain times. Over time, many content providers have seen a great deal of interest in online training for educators (Patil, 2009).

Computer-supported collaborative learning (CSCL) is the most promising innovations for improving instructional, engaging, or targeted instructions with ICT and learner support or collaborative learning. Overall, the difference between traditional learning and collaborative learning is that the instructor will provide knowledge and skills to the learner (Ryan, 2012).

eLearning systems use communication technology that is categorized into two types: asynchronous or synchronous.

Asynchronous eLearning is via technology-based events such as blogs and discussion boards. Participants may engage in the exchange of ideas or information without relying on the participation of other participants.

Synchronous eLearning provides an overview of participants attending virtual classroom learning, or even in a standard classroom enabled by technology. A basic learning style and activities are needed in an environment where learners carry out a variety of activities, such as frequent conversations in the form of virtual classrooms and/or conferences (Karahoca, Sahin, Karahoca, & Gungor, 2012).

2.2 eLearning Methods

eLearning NC (2018) mentioned online delivery and the communication via the Internet from which students can access and log in from anywhere around the world to access classroom content and interact with others. By using a classroom management system such as a blackboard, Moodle (n.d.), Vista (2018), or web browser, each institution can use its own unique system. This can be a combination of providing video and audio as well as a whiteboard screen to present the lesson, along with the presentation of course content and quizzes.

2.3 Delivery Methods (WorldWideLearn, n.d.com)

eLearning is accessed through the WORLD WIDE WEB and/or CD-ROMs, and sometimes (distance learning and traditional media. The most common methods used in eLearning are reported in Table 2.

Table 2: Delivery methods for eLearning

Print	• e-text
	• textbooks
	• e-magazine
Video	• streaming video
	• video tape
	• satellite transmission
	• cable
Audio	• streaming audio
	• audio tape
Review and Exams	• electronic
	• interactive
	• paper
Communication	Asynchronous eLearning
	• email
	• list servos
	• threaded discussion, weblogs
	• forums
	Synchronous eLearning
	• chat
	• videoconferencing
	• teleconferencing

Source: (WorldWideLearn, n.d.com)

2.4 The Advantages and Disadvantages of eLearning

eLearning has been used everywhere and across all types of areas. Businesses – private or public sector, non-profit organizations, NGOs (non-governmental organizations), and educational institutions alike employ the use of the system for teaching learners. eLearning is deployed with the objective of enhancing the students' knowledge while saving time and money. It has also helped to reach geographically dispersed groups to provide "anywhere-anytime" learning, consistency, compliance with regulations, and improved productivity. Businesses used eLearning to introduce their organizations, products, and services in addition to remedial training to provide

certification to their staff. It is also used to promote products and services, to support organizational initiatives, and to keep up to date with the latest software (Clarey, 2008.).

Moreover, eLearning also aids in promoting and developing human capacity. The creation of eLearning materials online enables students and participants to choose to study anything, anytime, anywhere. Undergraduate students are satisfied with the convenience, independence, and flexibility of the method. An eLearning system reduces the time to learn by more than 50% and the use of traditional training and teaching by around 30-60%. However, the use of eLearning was challenging during the initial period of its introduction. During the first few years, limited internet access caused a major roadblock to the success of this strategy. However, over the years with the Internet expanding its reach to almost everyone, the demand for eLearning has steadily grown at a steady pace by more than double each year and teaching via the Internet has become more accepted and appreciated.

The important thing about using instructional technology in the classroom is that both instructors and students need to accept this new concept and have some foundation in the knowledge of using the prerequisite technology, especially the Internet. Instructors need to have some knowledge of instructional design as it relates to the use of multi-media to make their lessons interesting, and they should be able to motivate the student to study. Learners should be able to study and understand the lesson by themselves step by step, with pictures and animation designed to enhance their understanding. They should know how to use the prerequisite technology and a network with high-quality hardware to facilitate connectivity in order to exchange ideas and accumulate more knowledge from group discussions. Most of all, a proper Learning Management System (LMS) used in educational institutions should be

established for both instructors and learners with facilities for tracking management and video-conferencing via the Internet (Ghirardini, 2011).

However, there is a disadvantage of eLearning, which is that the information available in the cyberspace has no limit. Since learners use the Internet as their source of knowledge for learning, there is always the chance of obtaining inaccurate facts or malicious information, which will in turn affect the overall learning process. Another factor that should always be considered as a disadvantage of eLearning is that although its use is cost effective, the development of the software, techniques, and approaches before it actually comes to use can be very costly.

However, the most controversial aspect of eLearning is for those who are seeking professional degrees. Some online learning institutions may not meet the academic standards set forth by private accreditation organizations. Accreditation standards are used to confirm a learning institution's academic quality. This does not mean that an online institution that is not accredited has poor academic quality, but it can cause problems when a learner seeks to transfer credits from an online institution to a traditional educational facility. Another drawback of eLearning is that it can be difficult for individuals who are not primarily self-motivated. While self-directed learning has been appropriately praised for its versatility, it can be a trap for those who need the external motivation that physical classrooms and instructors can provide (Arkorful, 2014).

2.5 eLearning Technology

According to Kapp (2003), eLearning software can be used either alone or in combination. There are five aspects as follow:

1) Programming language

2) Programming style

3) The program management system to learn.

4) Content management system (CMS) in the program.

5) Learning the CMS in the program.

In terms of programming language, the most commonly used one for online learning is HTML (Hyper Text Markup Language), which can be learned from a simple online tutorial. However, the use of straight HTML does not have a high degree of interactivity or interaction, so to increase this between students and the software, most HTML programming requires Java, JavaScript, PEARL, or CGI scripting. This is flexible and free, but the difficulty is the process in keeping the site up and running. The programming language is mostly focused on packages like Dreamweaver, which contains additional macromedia components. The drawback of these packages is to be able to monitor the performance of many learners. Most of them have no features that allow for real-time interaction: no chat rooms, threaded conversations, and limited time is used for voice communication of both parties but not used to store long-term data.

LMSs are designed to track the performance of many learners, just like the performance in the classroom, and offers the ability to monitor and store user performances for evaluation. It can track the number of viewers to certain areas of the site and is able to track the time they spend in certain areas. These systems allow students to enroll and once registered, the system automatically sends alerts to students for online classes. The LMS allows students to monitor themselves by showing their assignment scores in a virtual drop box, chat with other students, and join in specific groups in which only the group members can attend.

CMS refers to the tracking and cataloging of graphics, sound files, video files, and text files. It is compulsory to manage learners in terms of online trends. CMS is a

way to describe the content of the course, such as teacher contact, teaching schedule, etc. Content management is often not an important element for individual instructors or single people. However, it is difficult for many teachers to create content management courses.

A CMS is a source defining content, keywords, and extensive search capabilities. In order for the people involved with the course to be taught, developers can easily find what they want. For instance, you could type the keyword "business person" and get a list of all the artwork and video clips associated with the business person.

CMS gives plenty of room for educators who are willing to develop content that can be used the next time to save time. CMS can find new images to replace the original images of the developer.

A learning CMS (LCMS) is just a combination of several types of eLearning software. Most LCMSs provide task-based operations to assist users with the ability to write content and large data sources, and it can help the concerned person when needed. It can also be used to store and retrieve content.

It is very cost effective if used properly, but it is unfortunately often the case that the organization brought these systems into use without clearly understanding how to use them and there are no plans for increasing system performance. It is imperative that effective LCMS training and instruction be used.

2.6 Related Studies in the Use of eLearning in Thailand

In Thailand, eLearning is used for education, especially in higher education. Most universities use eLearning as a supplement to classroom instruction rather than as a primary teaching tool. Universities are given the opportunity to learn in a face-to-face and/or online format. This means that one-to-one lessons remain the basis of instructional delivery. While eLearning is used as an alternative for students rather

than increase classroom instruction, it requires a cultural change in the change management process to manage it thoroughly and strategically in order to ensure its success (Deerajviset & Harbon, 2014).

In the context of Thailand, Suanpang and Petocz (2006) carried out a study to check the efficiency and effectiveness of online learning systems for universities. Their findings showed that students' academic performance in online learning environments was better than in traditional classrooms. Bhatiasevi (2011) found that in four universities in Thailand, there was a level of satisfaction in eLearning, with online paths being higher than their counterparts in traditional classes. The intention of Thai students was to overcome the problem of using the eLearning system to obtain better scores, and they also showed more satisfaction with the eLearning content. However, the study found that teachers and students face many challenges when using eLearning.

Siritongthaworn, Krairit, Dimmitt, and Paul (2006) found that all of the instructors they interviewed lacked the confidence to use eLearning as they had little or no experience teaching online. From a student perspective, they found that communication on the network was slow and lacked decent software, and there were bad access points due to the challenge of engaging in eLearning. The results of this research were supported by Saekow and Samson (2011) who found that Thai teachers did not use eLearning as students perceived that the infrastructure had ICT problems.

Teo, Luan, Thammetar, and Chattiwat (2011) assessed the acceptance of eLearning by university students in Thailand. They concluded that the acceptance of eLearning was significant in relation to cognitive ability and was significantly positive for age. This shows that students are more likely to accept and participate in eLearning when users see themselves as technically capable, which is consistent with

Teo (2009). He found that when the perception of the user was good, the ability to use technology has a great influence along with positive thinking on the spirit of technology.

2.7 Studies Related to the Use of eLearning in the Food Industry

The development of eLearning concepts for SMEs in the agricultural and food sector of vocational business has shown that critical components such as workplace environment, target group, content, and design should be part of the basic approach to generate eLearning concepts that meet the target group. In addition, using eLearning is an important goal to provide insights into the businesses who want to take advantage of the Internet by giving their employees the opportunity to benefit from learning by attending the course at any time. The content of the present study was focused on the topic of quality management and supporting processes for SMEs and food industry personnel. The target group, workplace environment, content and design are the important factors to increase the competitiveness of the sector (Hansen & Schiefe, 2003), as is laid out in Table 3.

Table 3: Systematization of the Potential Origins of the Problems

Target group	The target audience has different elements.			
Workplace environment	Supervisors are not interested in supporting their employees.	The spread / operations is/are hindered by corporate culture.		
Content	The content is inappropriate for the learners.	The content does not match the working conditions.	The content is buggy and outdated.	
Design	The learning structure is not consistent with the learners.	The program does not reflect the needs of the learners.	The technical importance of the design is over content.	Bringing in an old style to use in modern technology.
	Target group	**Workplace environment**	**Content**	**Design**

Moreover, the article by Oosterveer (2008) reviewed several options to improve Thai SMEs' environmental performance using eLearning. These strategies were compared with existing practices in northern Thailand, in which a comparison of the specific attention was paid to the role of the national government, market actors, and local communities in implementing the strategies identified in the literature. There were four case studies in the province of Chiang Mai in northern Thailand as empirical evidence.

CHAPTER III

RESEARCH METHODOLOGY

Here, the different methods and procedures used to conduct the research study and reach its conclusion are presented. This includes the research design, the research instruments development, the sample and sampling method, the eLearning development process, data collection, and the statistical tools used the stated hypotheses for the research.

1. Research Design

A mixed method design that integrate qualitative and quantitative approaches was utilized in this study. In order to achieve the objectives of the research, a mixed approach can be used to provide more detailed and comprehensive information and can help answer some of the research questions. The four major types of mixed methods design are triangulation, embedded, explanatory, and exploratory. The research applied a sequential exploratory design, with qualitative data collection and analysis as a guideline for the development of quantitative tools to study the research problems. The process of the qualitative and quantitative approaches is described briefly in the following sections.

1.1 The Qualitative Approach

The qualitative approach was used to explain the characteristics with a view to understanding the topic from the perspectives of the population. Qualitative methods were also used to characterize problems and/or research topics from the population's perspective. In addition, qualitative research was particularly effective in obtaining specific information about the specific behavioral demographics. The three most common qualitative methods were participatory observation, in-depth interviews and

focus groups. However, each method is different depending on the type of information received.

In the present study, in-depth interviews were used for the needs assessment of business owners to manage their businesses. The questions explored the problems from different aspects of the entrepreneurs' business management and the key issues as recommended by the respondents were collated for developing the eLearning model in SME management skills.

1.2 The Quantitative Approach

A quantitative research study was conducted during which data were collected before and after the intervention (the online eLearning course). The same sample of participants was used to measure their knowledge and understanding in business management both pre- and post-intervention. The eLearning course contained various management skill lessons for the Thai Food Industry SME cluster.

Figure 2 shows the four main aspects of the quantitative research methodology comprising the sample size and sampling technique, research instruments, method of data collection, and analysis to answer the specific research questions.

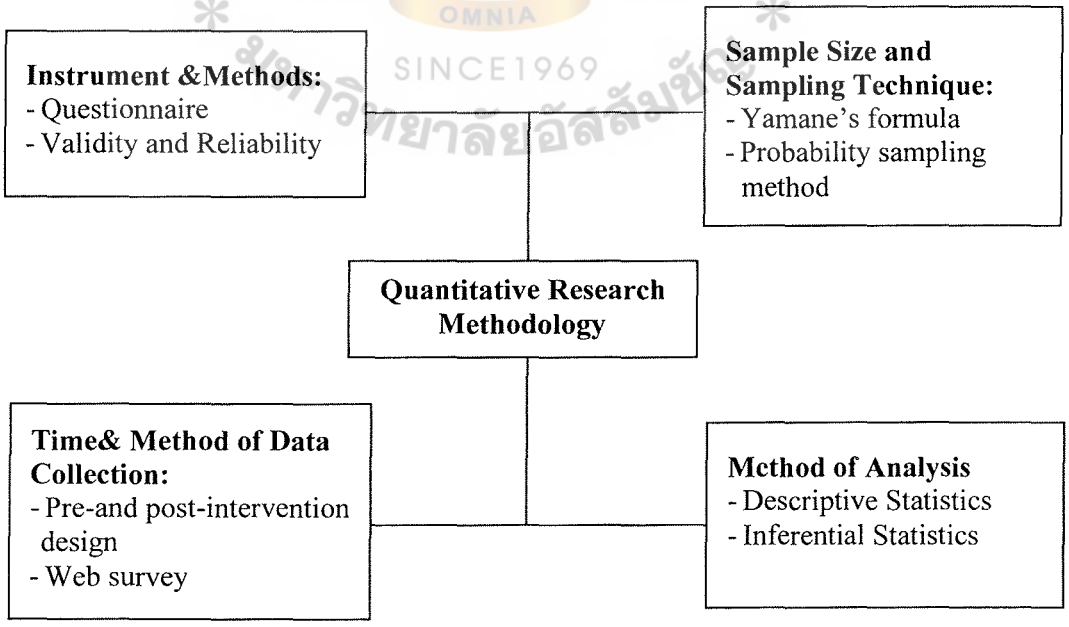


Figure 2: The Four Main Aspects of the Quantitative Research Methodology

2. The Development of the Research Instrument

The research instruments used in this study were a questionnaire and an eLearning model. For developing the structure and content of the model, three experts from different areas, namely education, management, and information technology (IT) and multimedia covering all aspects of the MONARCHIST model: business management, online learning, and web-based education were interviewed.

The main issues covered by the interviews were as follows:

1) Overview of the lessons: Do the lessons have a clear introduction, relieve confusion, and have a clear purpose?

2) Lessons: Are they consistent with the purpose of learning? Is the relationship between them continuous? Is the sequence of learning complete and appropriate? Do they use correct and clear language?

3) The system of teaching: Does the systematic design give the learner the opportunity to control the learning sequence and return to it appropriately?

4) Graphics and design: Do theses help to communicate with the user properly and in an interesting way with clear illustrations that convey meaning and content?

5) Technical: Can the Monarchist model be applied to any computer with minimal qualifications required by the developer without the problems of visual and audio rendering?

2.1 Questionnaire Measurement

The questionnaire comprised three main parts as follows:

1) The needs of the 30 business owners for the eLearning web-based model.

2) The measures of the participants' opinion of the lessons were on Lesson Content, Lessons, Design and Graphic Components, Interactive Design, and Internet Technical Aspects.

3) An evaluation of the satisfaction of the business owners with the eLearning model in management skills for the Thai Food SME cluster.

The questions for the needs assessment survey were open-ended, which allowed the interviewees to give free-form answers in whatever way they wished and to elaborate on them. Consequently, the key issues recommended by the respondents were listed for developing the eLearning model in Food Industry SME management skills. After completing the eLearning model, a five-point Likert scale was used to measure and evaluate the learners' opinions on it. Based on an interval scale of the average score, the interpretation of the results was as follows: 1.00–1.80, very dissatisfied; 1.81–2.60, dissatisfied; 2.61–3.40, neutral; 3.41–4.20, satisfied; and 4.21–5.0, very satisfied.

2.2 Validity and Reliability Testing

The eLearning model as a learning medium and the research instrument consisted of the nine chapters, including business management content, practice, and an exam. To determine the content validity of the three parts of the questionnaire, a panel of three experts was used. The item-objective congruence method (IOC) was used to assess which items were valid (Rovinelli & Hambleton, 1977). Experts were asked to rate items on a scale of -1 (disagree) to 1 (agree) without knowing the constructs they were assigned to. After the calculations, the IOC scores from the experts were set to equal 1.00 for all of the items, as is standard practice.

Moreover, the reliability testing of the questionnaire was performed to measure the internal consistency in parts 2 and 3 of the questionnaire using Cronbach's alpha (Bland & Altman, 1997). A pilot study was conducted on a sample of 30, the results of which showed the Cronbach's alpha values obtained for both parts of the questionnaire were higher than 0.7 (Table 4), which indicated a high degree of internal consistency. Thus, the questionnaire used for collecting data from the respondents in this research was reliable.

Table 4: Reliability Measurement of the Items in Parts 2 and 3 of the Questionnaire

Questionnaire	No. of items	Cronbach's alpha
Part 2: The measure opinion of the lessons	20	0.871
Part 3: The satisfaction evaluation of the eLearning model	14	0.862

3. Sample Size and Sampling Method

In order to make an inference on the results from the sample to the population, an appropriate sample size and the probability of sampling were required. The eLearning model along with the questionnaire, practice, and exam was provided to collect the data at different levels of business executives working Food Industry from North, Northeast, Middle, East, West, and South Thailand. According to the Department of Industrial Works (2015), the total size of this population was 1,274 members (Table 5).

Table 5: The Total Size of the Population

Sector	Number of companies*
Starchy foods	235
Meat	266
Ice cream & Bakery	470
Snack foods	117
Sauces & Condiments	186
Total	**1,274**

**Source:* Department of Industrial Works (2015)

The Sample Size of this study was calculated based on Yamane's (1976) formula:

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

$$= \frac{1,274}{1 + (1,274)(0.05)^2} = \frac{1,274}{4.185} \approx 305,$$

where n = sample size,

N = the size of population, and

e = tolerable error (5%).

Therefore, the minimum sample size for this study was 305 enterprises. The probability sampling (stratified systematic sampling) was used for sample selection as follows:

Step 1: Classify the enterprises into 5 business sectors: starchy foods, meat, ice cream and bakery, snack foods, and sauces and condiments.

Step 2: Carry out PPS (probability proportionate to size) systematic sampling within each stratum.

Step 3: Collect data from one entrepreneur for each enterprise.

As presented in Table 6, the sample allocated to each stratum was proportional to the number of units in the frame for the stratum.

Table 6: Number Selected for a Proportional Stratified Random Sample

Sector	Number of companies	Sample Size
Starchy foods	235	57
Meat	266	63
Ice cream and Bakery	470	113
Snack foods	117	28
Sauces and Condiments	186	44
Total	**1,274**	**305**

4. The Data Analysis

The efficiency testing of the model was conducted by using the questionnaire to collect data for testing eLearning. The tryouts consisted of a single subject (n = 3), a small group (n = 30), and a field tryout (n = 305). The researcher analyzed the results of the tryouts to determine the efficiency of the model based on the 80/80 efficiency criterion.

The descriptive statistics included frequency, percentage, mean, and SD, which were used to describe the basic features of the data in this study, i.e. the participants' profile, opinions, and satisfaction with the eLearning model. In addition, the null hypotheses were tested by using inference statistics, the information for which is provided in Table 7.

Table 7: The Null Hypotheses of the Test

No.	Description
H1:	There are no differences between the genders on the satisfaction and learning outcomes with the MONARCHIST model.
H2:	There are no differences among age groups on the satisfaction and learning outcomes with the MONARCHIST model.
H3:	There are no differences among education levels on the satisfaction and learning outcomes with the MONARCHIST model.
H4:	There are no differences among business sectors on the satisfaction and learning outcomes with the MONARCHIST model.
H5:	There are no differences among business sizes on the satisfaction and learning outcomes with the MONARCHIST model.
H6:	There is no difference between the management skills pre-test and post-test mean scores of the entrepreneurs.
H7:	There is no association between education level and the topic of major interest.
H8:	There is no association between business sector and the topic of major interest.

Table 7: The Null Hypotheses of the Test (Cont.)

No.	Description
H9:	There is no relationship between lesson components and overall satisfaction.
H10:	There is no relationship between lesson content and overall satisfaction.
H11:	There is no relationship between the system of teaching and overall satisfaction.
H12:	There is no relationship between the graphics and design and overall satisfaction.
H13:	There is no relationship between the interactive design and overall satisfaction.
H14:	There is no relationship between internet technical support and overall satisfaction.

5. Statistical Techniques

Various statistical techniques were used to test the hypotheses: the paired *t*-test, MANOVA, the Chi-squared test, and a correlation analysis. In this study, the researcher set the significance level for hypothesis testing at $\alpha = 0.05$. If the *p*-value was less than (or equal to) α, the null hypothesis was rejected in favor of the alternative hypothesis, else it was not rejected.

CHAPTER IV

DEVELOPMENT OF MONARCHIST MODEL

In this chapter, the MONARCHIST model is developed for business owners and the employees in the Thai Food Industry those who are interested in management. The MONARCHIST model introduces the principles of how to manage an SME in the Thai Food Industry. The procedure for model development as well as for model design and approach are described as follow.

1. The Procedure for Developing the MONARCHIST eLearning Model

Both qualitative and quantitative methods play important roles in the eLearning model development for the Thai Food Industry SME entrepreneurs in Thailand. The eLearning model development process was achieved in seven steps as follows:

Step 1: Related literature on the Thai food industry, business management, and eLearning technology was reviewed in order to define the guiding concept of the research questions.

Step 2: The conceptual framework for the development of the eLearning model was developed. The framework was designed to be a useful tool in all aspects of model planning and development.

***Step 3*:** The needs of the business owners to manage their businesses were studied by conducting in-depth interviews. Some of key factors affecting the Thai Food Industry entrepreneurs were listed to develop the model.

***Step 4*:** Three experts with different areas, namely, education, management, and IT and multimedia were interviewed, covering all aspects of the MONARCHIST model: business management, online learning, and web-based education to develop the structure and content of the model.

Step 5: The MONARCHIST model was formulated according to the conceptual framework of Botha (1989). The researcher designed the lessons and arranged content related to the needs of business owners to manage their businesses, selected an LMS, and prepared resources including the practice and an exam.

Step 6: The efficiency testing of the MONARCHIST model was conducted by carrying out a trial run with the SME entrepreneurs. These tryouts consisted of individuals (1:3), a small group (1:30), and field testing (1:305). The efficiency of the model was tested according to the 80/80 criteria (E1/E2) (Brahmawong, 2013).

Step 7: After testing the efficiency (tryout) for each group, the model was validated and improved according to the results.

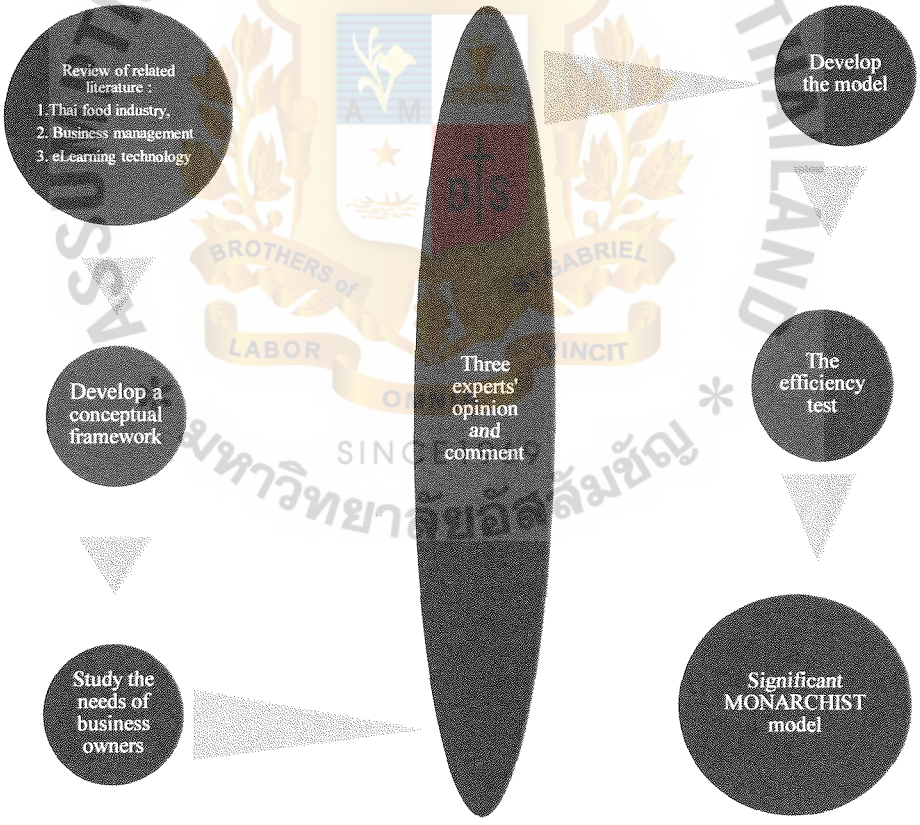


Figure 3: The Steps in Developing the MONARCHIST Model

2. The MONARCHIST Model Design and Approach

Documentation of the perceptions of and satisfaction of the Thai Food Industry SME entrepreneurs toward the utilization of eLearning model is provided in this study. The MONARCHIST model was created using the LMS of the Office of the Basic Education Commission, (OBEC), which was adapted from Moodle (n.d.) for use in schools by the Office of Technology for Teaching and Learning (n.d.). OBECLMS is an open source program developed from OBECLMS 2.3 - 2.7 (OBEC, n.d.). The eLearning system is the management system for teaching through the Internet or sometimes called the real classroom at a convenient time.

The MONARCHIST model comprises the lesson content, nine lessons, the LMS, and a centralized LMS, in which each component was designed to be interconnected systematically and to work together harmoniously. First, the lesson content, which is considered as the most important. Second, nine lessons, which including exercises and exams. Third, the LMS. Fourth, a centralized LMS, defining the sequence of the lesson content, and to send lessons through the computer network to students.

The first page of the website http://www.monarchistmodel.net and a sample page of the introduction to MONARCHIST model is presented in Figure 4, while each lesson is shown in Figures 6-14.

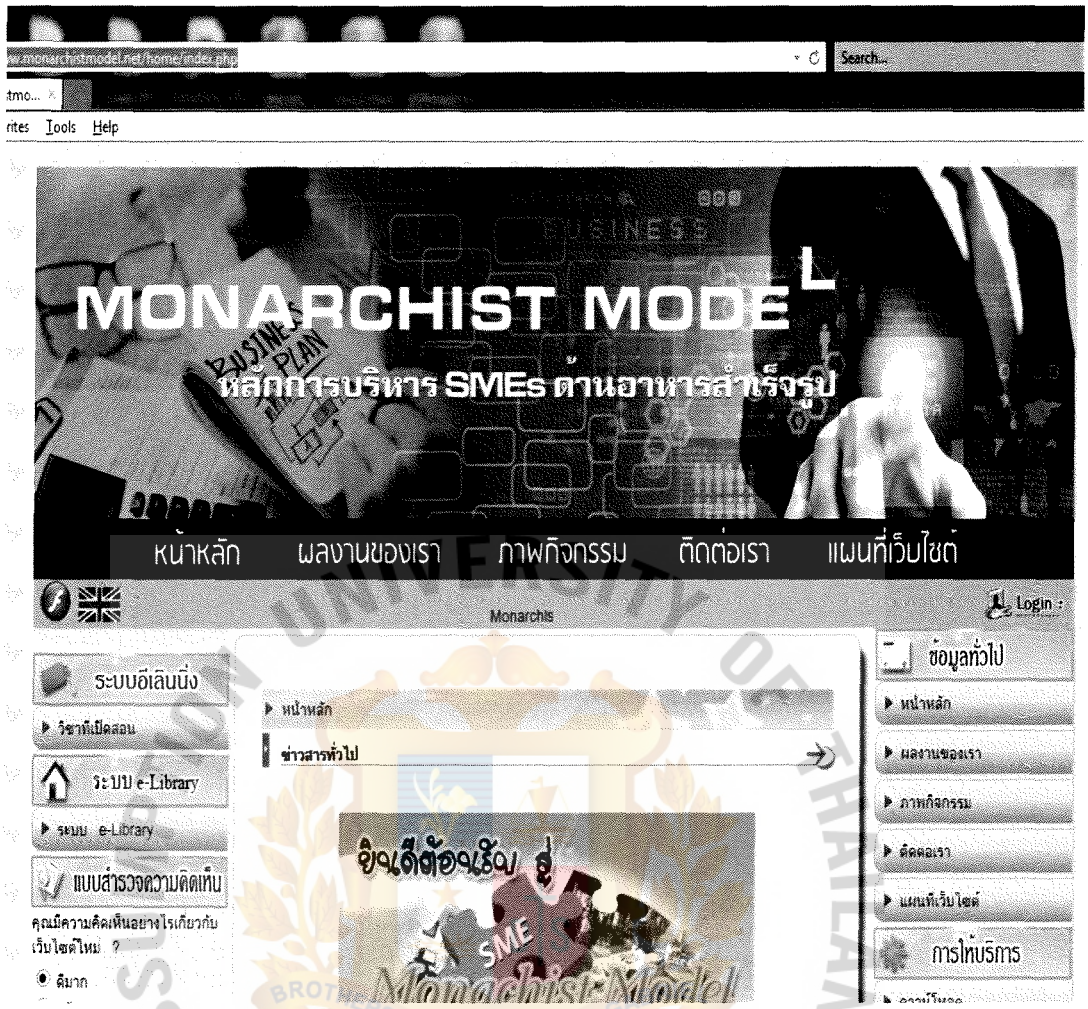


Figure 4: The MONARCHIST Web Page

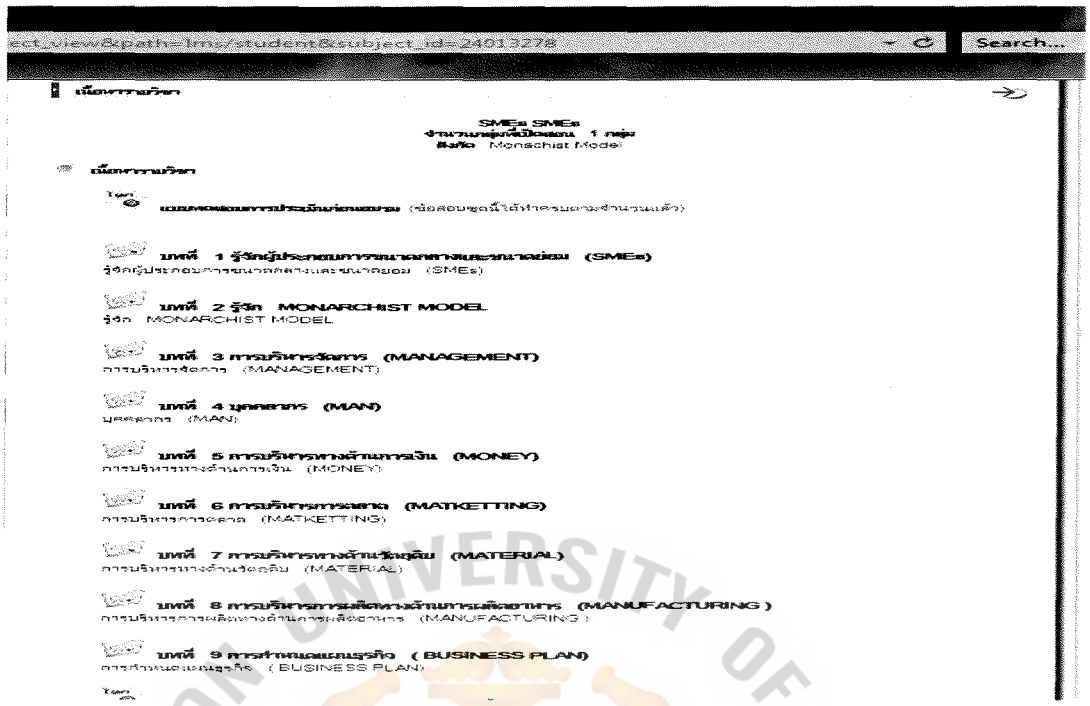


Figure 5: The Lesson Content

Lesson 1: Introduction to SMEs in Thailand

Lesson 2: An overview of the MONARCHIST Model

Lesson 3: Management

Lesson 4: Manpower

Lesson 5: Money

Lesson 6: Marketing

Lesson 7: Materials

Lesson 8: Manufacturing

Lesson 9: Business Plan

As mentioned above, the MONARCHIST model was designed with 9 lessons according to the needs of the learners and experts' recommendations as follows:

Lesson 1: Introduction to SMEs in Thailand

- Small and Medium Enterprises (SMEs)
- SME Classification
- The importance of SME to the economy
- Issues and limitations of SMEs in general
- SME situation in Thailand
- New steps to entrepreneurship SMEs in Thailand

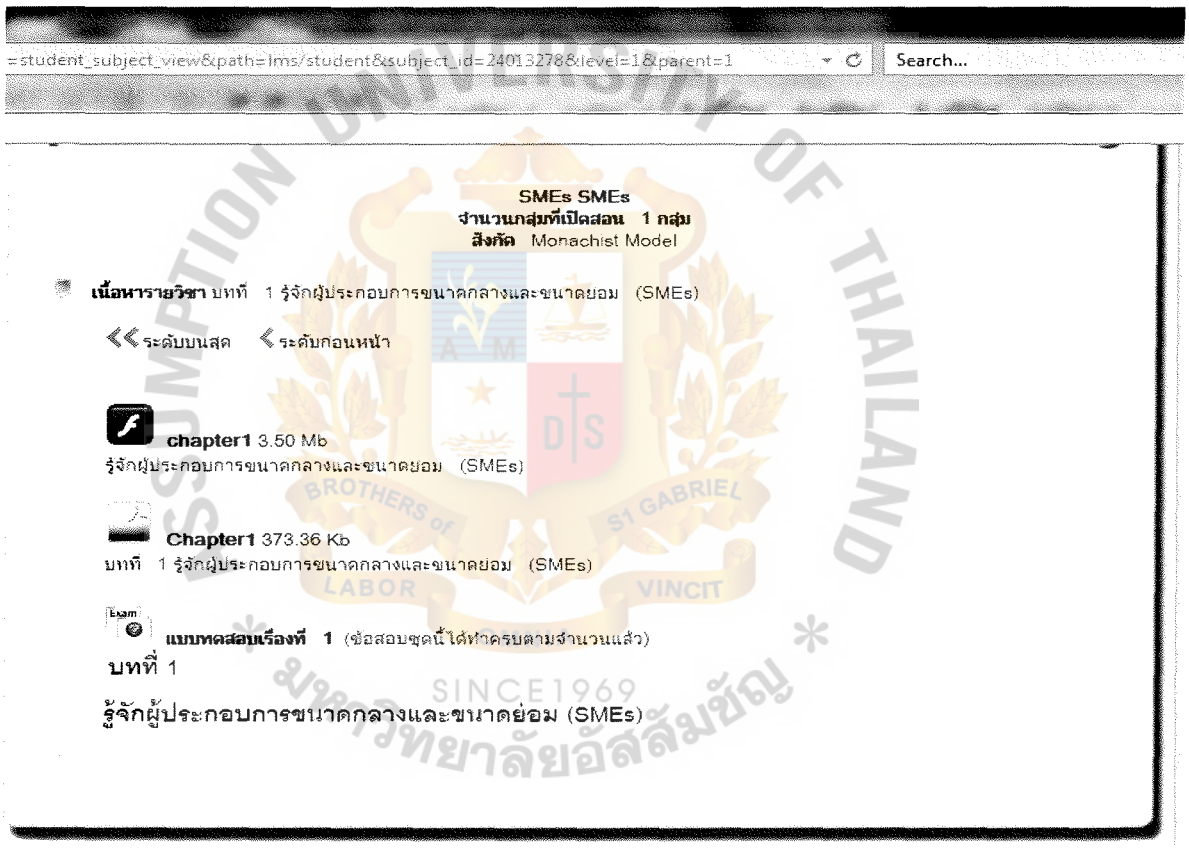


Figure 6: Lesson 1: Introduction to SMEs in Thailand

Lesson 2: An Overview of the MONARCHIST Model

- Management
- Manpower
- Money
- Marketing
- Material
- Manufacturing

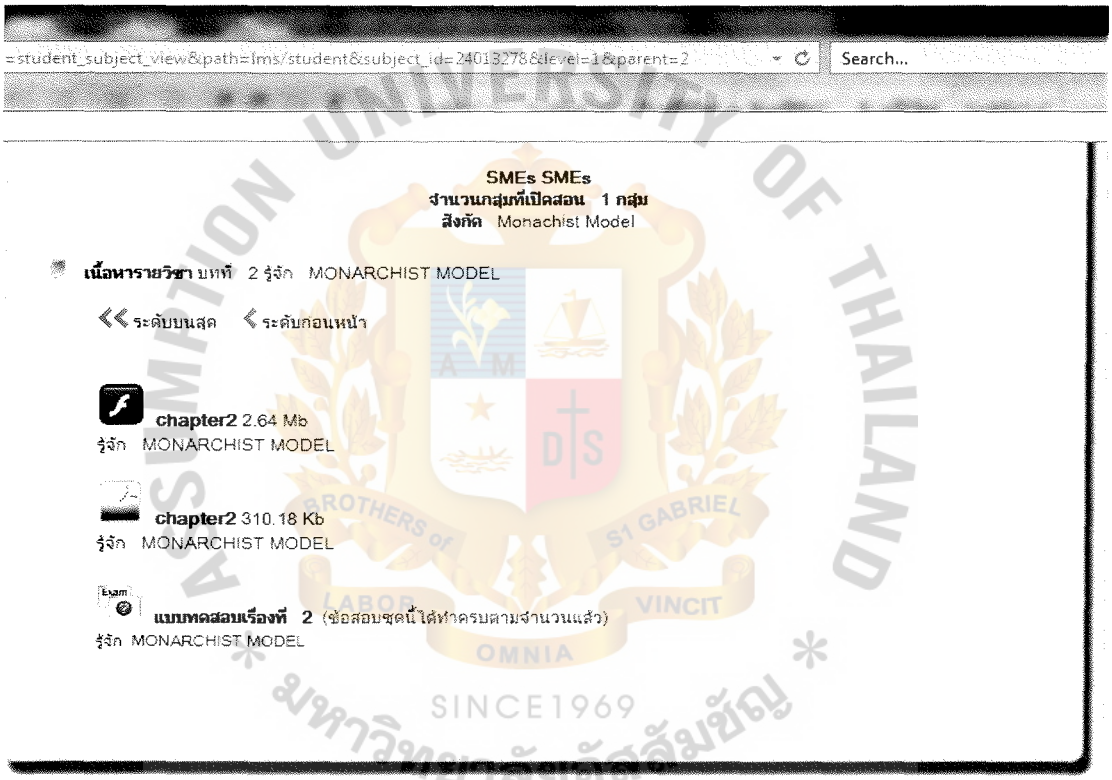


Figure 7: Lesson 2: An Overview of the MONARCHIST Model

Lesson 3: Management

- Business management based on the MONARCHIST model

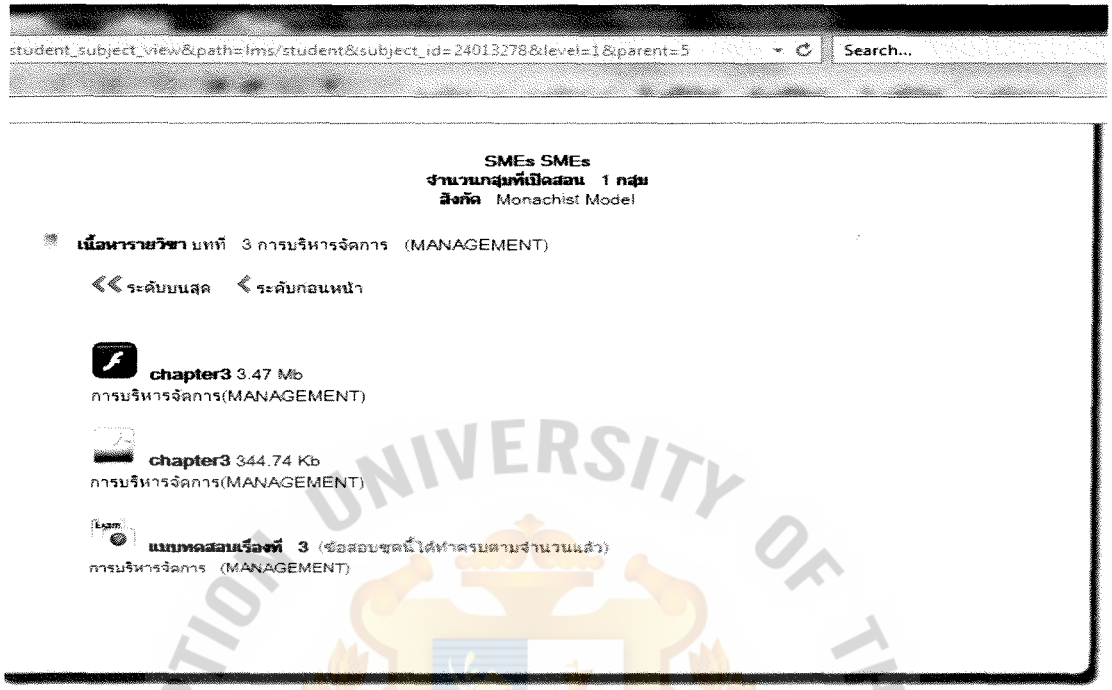


Figure 8: Lesson 3: Management

M = MANAGEMENT (5W-1H)

O = OPPORTUNITY, ORGANIZATION, OBJECTIVES

N = NEEDS, NETWORKING

A = ACKNOWLEDGEMENT

R = RISK, RELATIONSHIPS

C = COOPERATION (SWOT), COMMON, CUSTOMER, COMPETITION

H = HUMAN (BEING)

I = IDEA, INNOVATION, INVESTIGATION

S = STRATEGY, SYSTEM

T = TARGET, TIME MANAGEMENT, THREAT, TRAINING

Lesson 4: Manpower

- HR management based on the MONARCHIST model

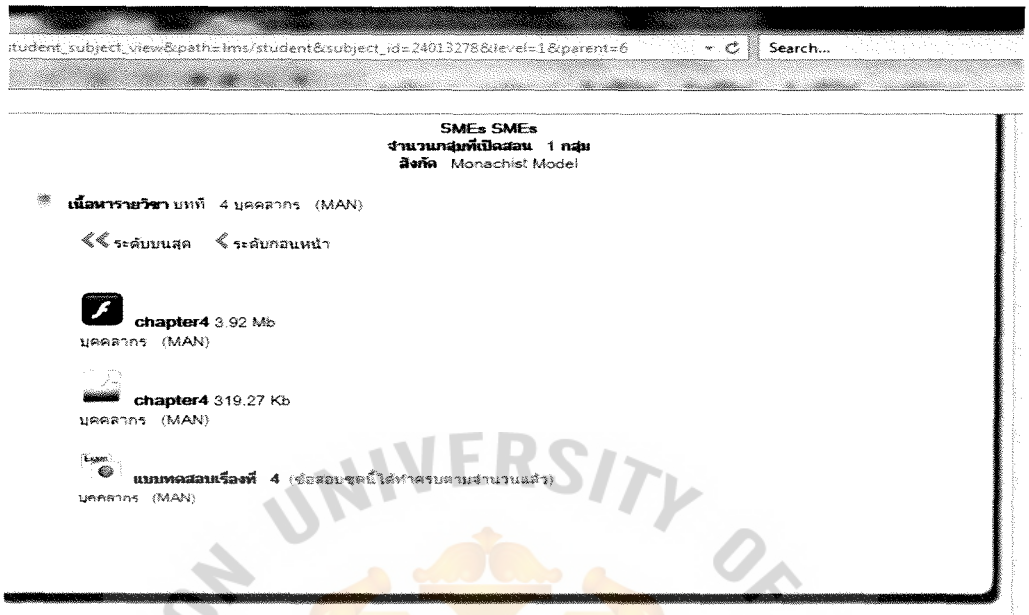


Figure 9: Lesson 4: Man

M = MANPOWER (Merit system)

O = OBLIGATION, ORIENTATION

N = NETWORKING, NEED (PERSONNEL PLANNING)

A = APPLICATION

R = RELATIONSHIPS, RECRUITMENT

C = CONTROL

H = HOW

I = INVESTIGATION

S = SATISFACTION

T = TRAINING, TREATS

Lesson 5: Money

- The MONARCHIST model for money management

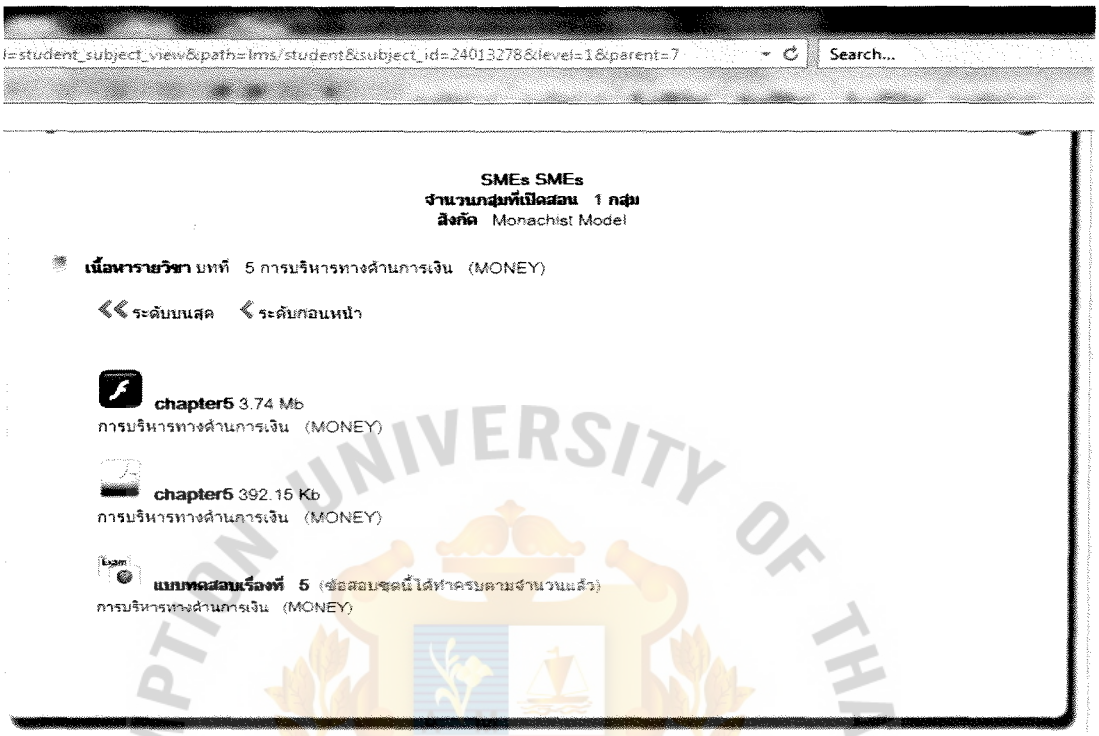


Figure 10: Lesson 5: Money

M = MONEY

O = OBLIGATIONS (FINANCIAL)

N = NETWORKING

A = ACCOUNTING

R = RISK

C = CONTROL

H = HOW

I = INTEREST, INVESTIGATESTION

S = STRENGTH, SAVING, SOLVING

T = TRAINING

Lesson 6: Marketing

- Marketing management based on the MONARCHIST model

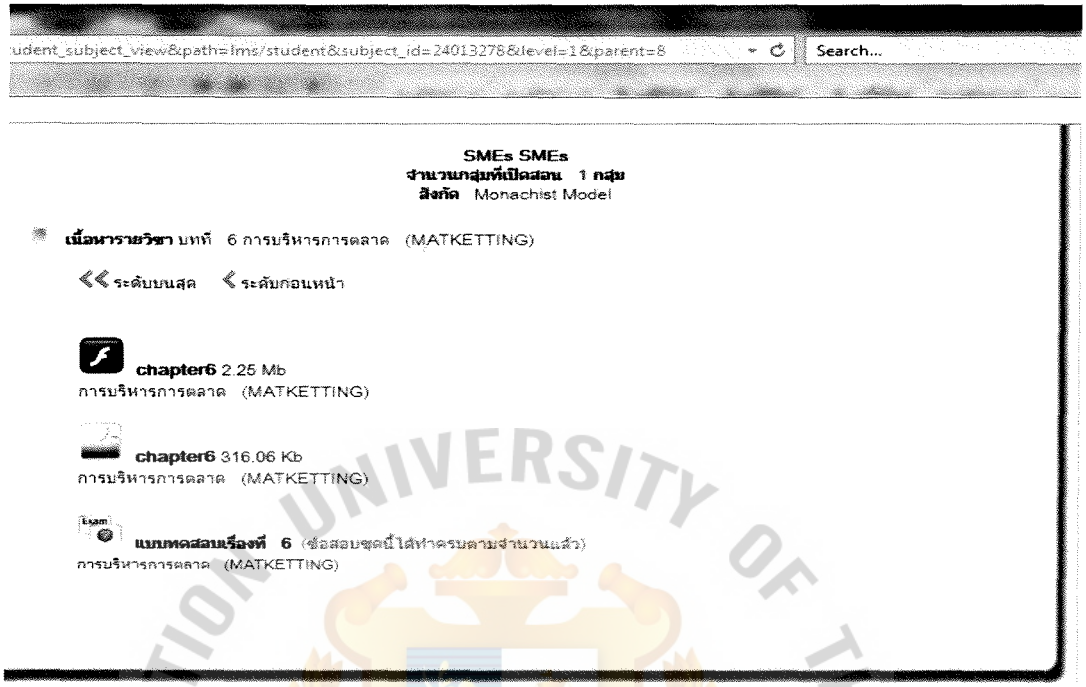


Figure 11: Lesson 6: Marketing

M = MARKETING

O = OBLIGATIONS (TARGET)

N = NETWORKING

A = ADVERTISING, APPROVAL

R = RECORDS, RELATIONSHIPS, RISK

C = CUSTOMER, COMPETITOR

H = HOW, HONESTY

I = INTERNET

S = SOLVING

T = TRAINING

Lesson 7: Material

- Material management based on the MONARCHIST model

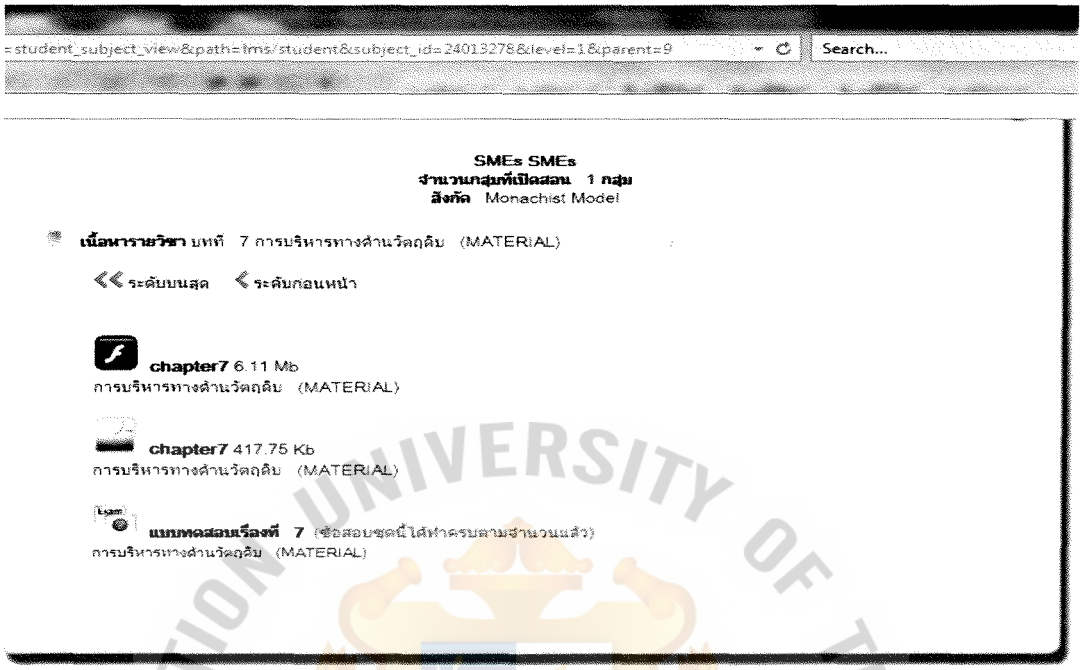


Figure 12: Lesson 7: Material

M = MATERIAL

O = OBLIGATION

N = NEEDS, NETWORKING

A = ASCRIPTION, ASSUMPTION

R = RECORD, RISK

C = COMMUNICATION, CORRUPTION

H = HOLD TOGETHER

I = INSPECTION

S = SUPPLY, SPECIFICATIONS, STOCK, STANDARD

T = TRAINING

Lesson 8: Manufacturing

- Manufacturing (production) management based on the MONARCHIST model

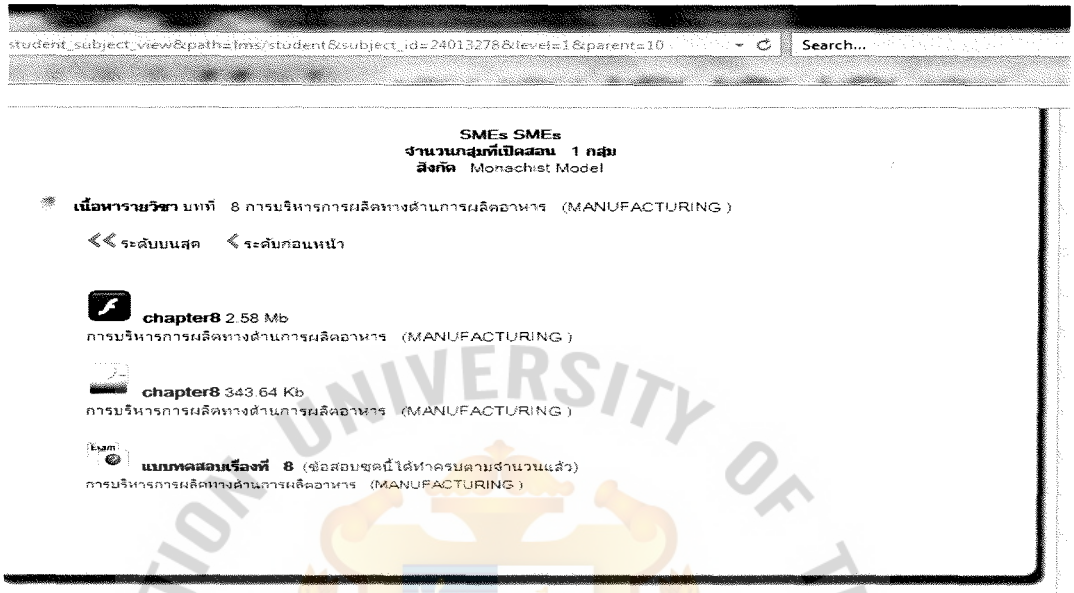


Figure 13: Lesson 8: Manufacturing

M = MANUFACTURING

O = OBLIGATIONS (FINISHED GOODS)

N = NATURAL

A = AWARENESS

R = RISK, RESULTS

C = COMMUNICATION

H = HEALTH

I = INNOVATION

S = STANDARDS (GMP, HACCP, or ISO), STRENGTH, SUPPORT, STOCK

T = TRAINING

Lesson 9: Business Plan

- Choosing a good business opportunity
- Data gathering
- Marketing analysis and business analysis
- Defining the business model
- Start business planning

Figure 14: Lesson 9: The Business Plan

The model components in each lesson module were divided into learning content, exercises, and exams. Figures 15 to 20 show the sample pages of exercises, and exams.

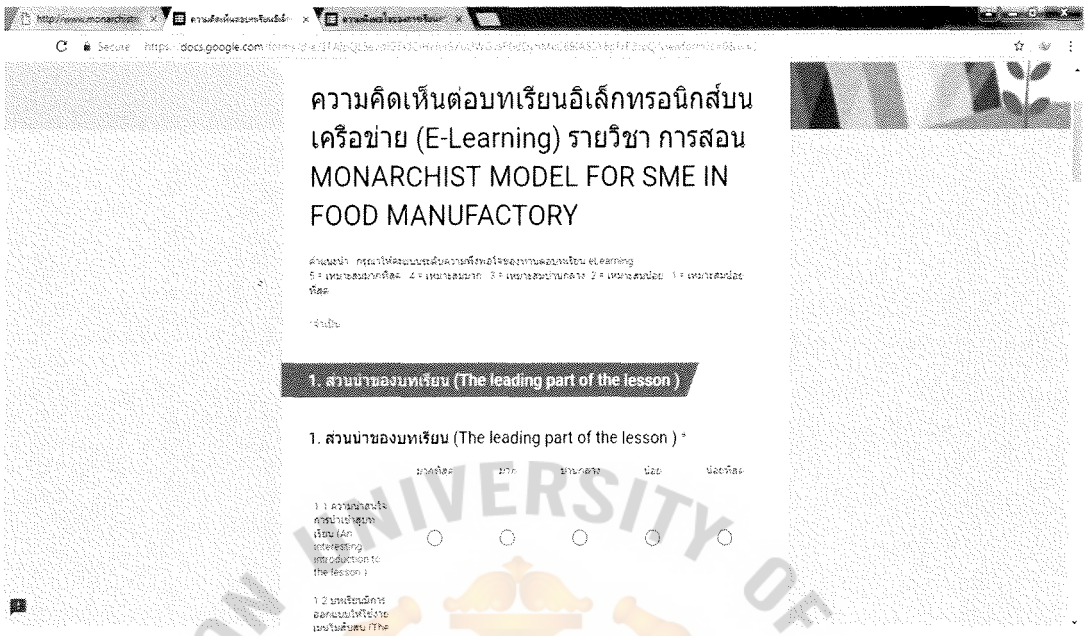


Figure 15: The Exercise on the MONARCHIST Model for SME in Food Factory

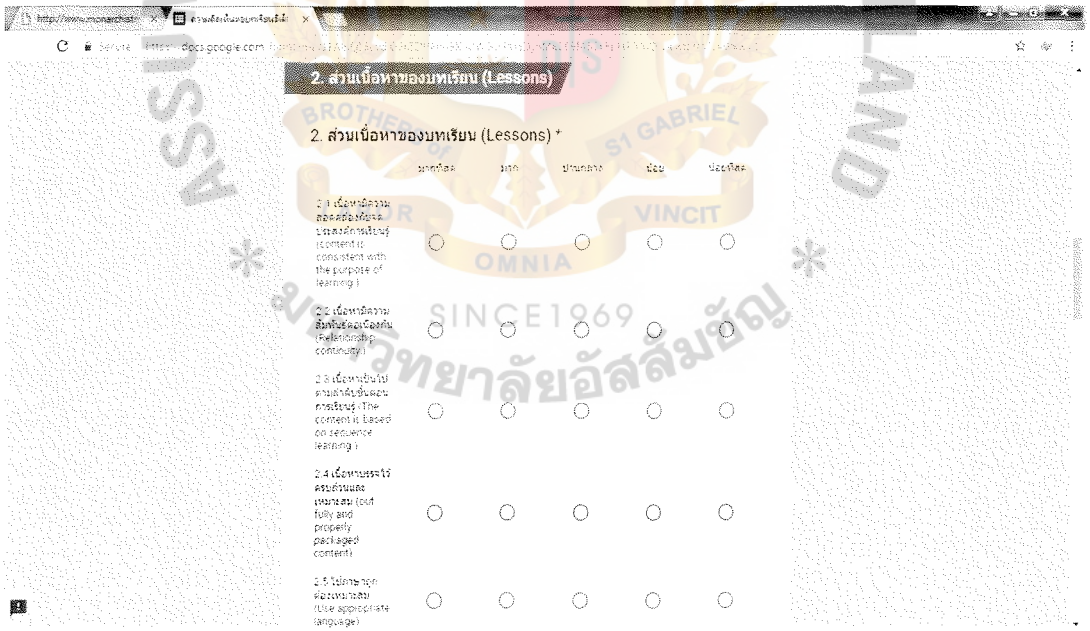


Figure 16: Exercise (Lesson)

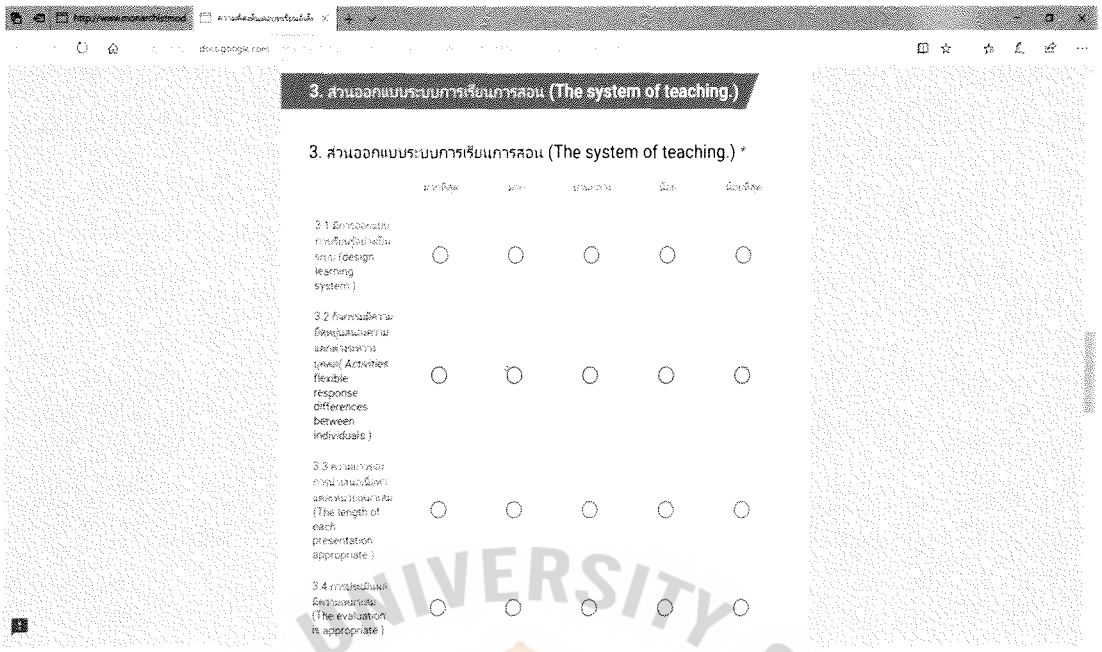


Figure 17: Exercise (The System of Teaching)

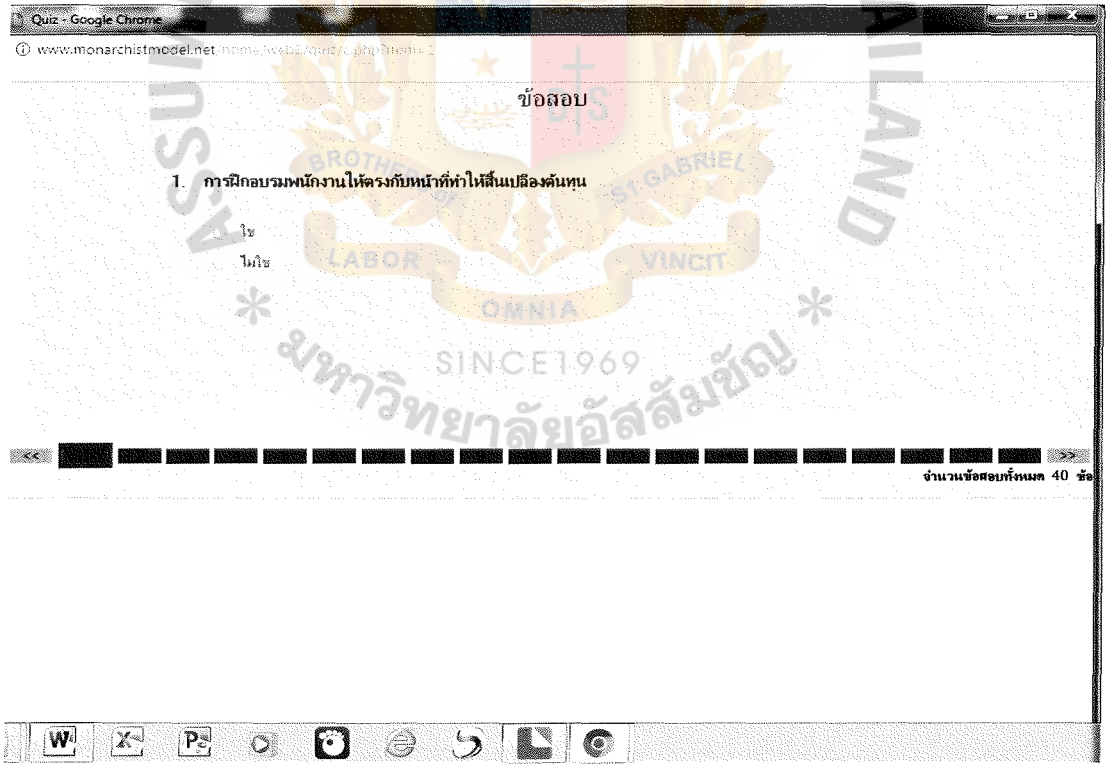


Figure 18: Exam Test of the Pre-Post Test 1

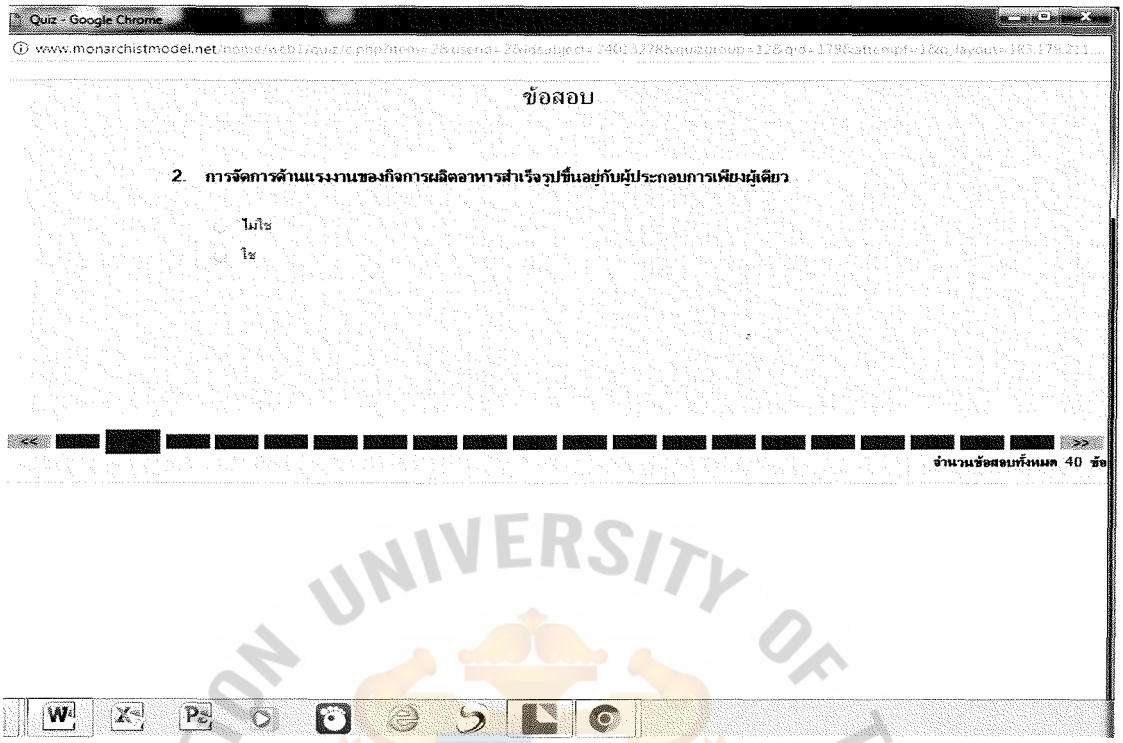


Figure 19: Exam Test of the Pre-Post Test 2

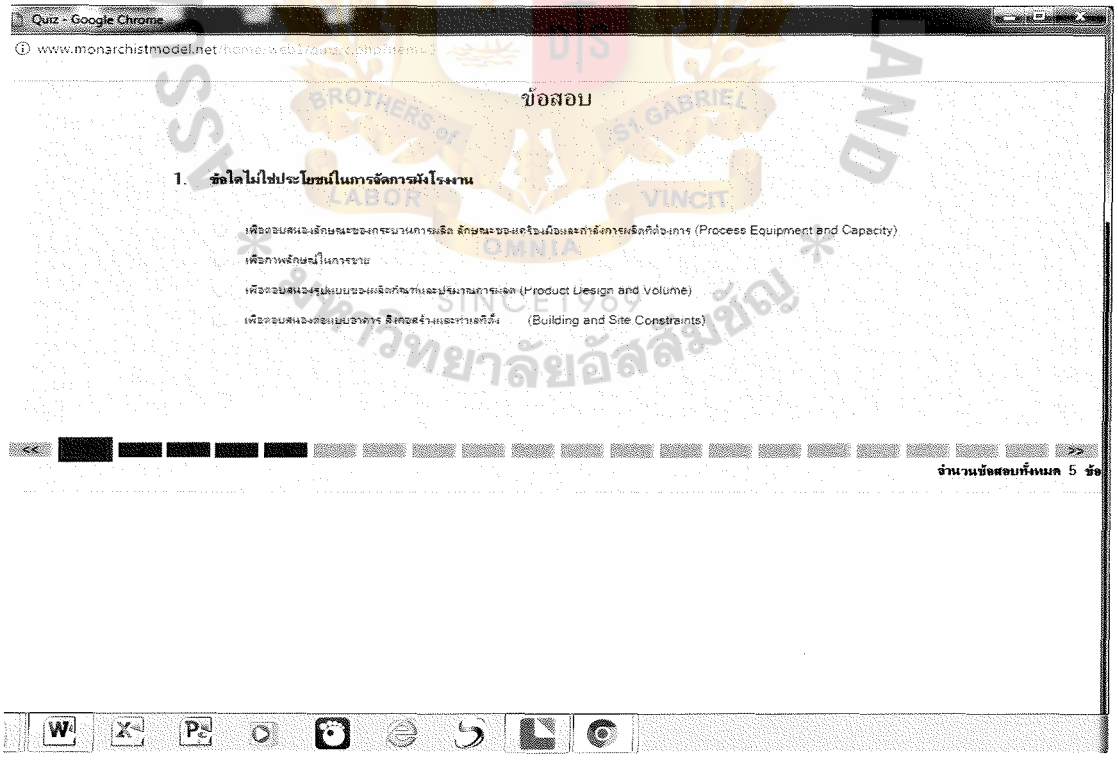


Figure 20: Exam Test of the Lesson: Manufacturing

CHAPTER V

DATA ANALYSIS

In this chapter, the results based on the previously discussed methods are presented. In addition, it contains a discussion on the in-depth interview results, focusing on topics including the problems of business management skills and guidelines for developing the eLearning model based on the recommendations for the model development from the SME entrepreneurs and experts. Consequently, the content of each eLearning module was designed. In addition, the results of the data analysis based on the research objectives are discussed, which includes the general descriptive statistics, efficiency testing, and the inferential statistics for hypotheses testing.

1. The Needs Assessment Interviews

From the in-depth interviews with 30 participants (Thai Food industry SME entrepreneurs), the problems which affected SME management were identified, from highest to the lowest, as follows:

1) Money (96.7%): Lack of cash flow and inaccessibility to financial resources, lack of security to guarantee financial loans, no clarity to show revenue, and no proper accounting system to assess the state of the business.

2) HR (93.3%): Little employee loyalty to the organization, work skills, and responsibility in their work.

3) Management (90.0%): No management system. Most SMEs under family management and do not have access to new learning resources. With regard to the original production methods, they tend to stay within their current market. Boredom with the family business resulting in a lack of enthusiasm.

4) Marketing (86.7%): A lack of marketing leading to a lack of expansion, a lack of marketers willing to devote time and effort to the organization, and an inability to keep records on the repaying of debts by customers who are unwilling or unable to pay. Sales staffs take into account their personal interests rather than the organization, and the income and opportunity of business rather than attention to their duties, except when the income source is good.

5) Manufacturing (23.3%): A lack of effective supervisors with the ability to control labor to follow good manufacturing processes. Employees lack the ability to develop new products.

6) Materials (10.0%): A lack of knowledgeable buyers, a lack of ability to control suppliers of raw materials, and a lack of academic staff and funding.

Based on the aforementioned factors, the learners' needs were to carry out accurate financial management and to access funding sources. Personnel management for the strength of the business and the knowledge management including sales, purchasing, and production management were also required to improve the way to run a business that needs to grow.

2. The Results of Model Efficiency Study

The researcher conducted trials comparing the percentage of formative assessment scores with the summative assessment scores based on the 80/80 (E1/E2) efficiency criterion. The E1/E2 formula was as follows (Brahmawong, Netprasoet, & Sinsakun, 1977, p.51):

$$E_1 = \frac{\left(\frac{\sum X}{N}\right)}{A} \times 100$$

E_1 = Efficiency of the process

$\sum X$ = Total score of all learners obtained from the exercises

N = Number of all the learners

A = Total score of the exercises in the lessons

$$E_2 = \frac{\left(\frac{\sum F}{N}\right)}{B} \times 100$$

E_2 = Efficiency of the learning outcome

$\sum F$ = Total score of all learners obtained from the post-test after learning through the model

N = Number of all the learners

B = Total score of the exercises in the post-test

There were three tryouts to evaluate the lessons: individual, small group, and field tryouts. The results of each tryout reported in Table 8.

Table 8: The Results of the Three Trials

Content	Trials		
	Individual Testing (1:3)	Small Group Testing (1:30)	Field Testing (1:305)
Lesson 1	60.00/66.67	68.00/77.50	82.39/84.67
Lesson 2	60.00/75.00	69.00/74.17	83.16/86.73
Lesson 3	53.33/66.67	72.00/70.00	80.58/84.85
Lesson 4	53.33/66.67	73.33/70.83	82.65/86.64
Lesson 5	66.67/66.67	70.67/72.50	75.16/85.86
Lesson 6	60.00/66.67	70.00/70.00	89.16/81.10
Lesson 7	66.67/60.00	69.33/69.33	84.58/78.29
Lesson 8	60.00/60.00	74.00/74.67	83.48/ 79.25
Lesson 9	66.67/53.33	67.33/72.08	87.10/80.96

The analysis of the trials indicated that the efficiency of the process and product for the individual and small groups tests were below the standardized criteria of 80/80. This indicated that the instructional package was not appropriate to the participants' learning abilities. According to the feedback given by the participants, it was found that they required some rearrangement of the content categories for each lessons in order for them to have a better understanding, and so the lessons were revised. Consequently, the efficiency of the process and product with the small group improved but did not yet meet the standard 80/80 criterion. The researcher added explanations, examples, and improved the questions at the end of the lessons, as mentioned by the learners. After the revision, the field trial was conducted. The efficiency of the process and product met the standard criterion of 80/80, and was thus proven to be efficient.

3. Descriptive Statistics in Data Analysis

3.1 Demographic Profile

The demographic information of 305 participants were collected and analyzed, as summarized in Table 9. The majority of the samples were male (56.8%). Most of

the participants were over 55 years old (23.8%), followed by 35-40 years old, 41-45 years old, 51-55 years old, 46-50 years old and under 35 years old (19.5, 17.6, 16.4, 12.9 and 9.8%, respectively).

Most of them held a bachelor's degree and higher (46.2%), followed by secondary school (23.3%), vocational education (18.8%), and undergraduate secondary school (11.7%). About one-third of the respondents had an ice cream and bakery business (37.0%) followed by meat (20.7%), starchy foods (18.7%), sauces and condiments (14.4%), and snack foods (9.2%). In terms of business size, 36.7% of the SMEs had 5-10 workers, followed by 1-4 workers (27.9%), 11-20 workers (13.4%), more than 51 workers (11.8%), and 21-50 workers (10.2%).

Table 9: The Demographic Profile of the Participants

Demographic Characteristics	Information	Number (n=305)	Percentage
Gender	Male	173	56.8
	Female	132	43.2
Age	Under 35 years old	30	9.8
	35-40 years old	59	19.5
	41-45 years old	54	17.6
	46-50 years old	39	12.9
	51-55 years old	50	16.4
	Over 55 years old	73	23.8
Education Levels	Undergrad secondary school	36	11.7
	Secondary school	71	23.3
	Vocational education	57	18.8
	Bachelor's degree and higher	141	46.2
Business Sectors	Starchy foods	57	18.7
	Meat	63	20.7
	Ice cream and bakery	113	37.0
	Snack foods	28	9.2
	Sauces and condiments	44	14.4
Business Size	Not more than 5	85	27.9
	5-10	112	36.7
	11-20	41	13.4
	21-50	31	10.2
	More than 51	36	11.8

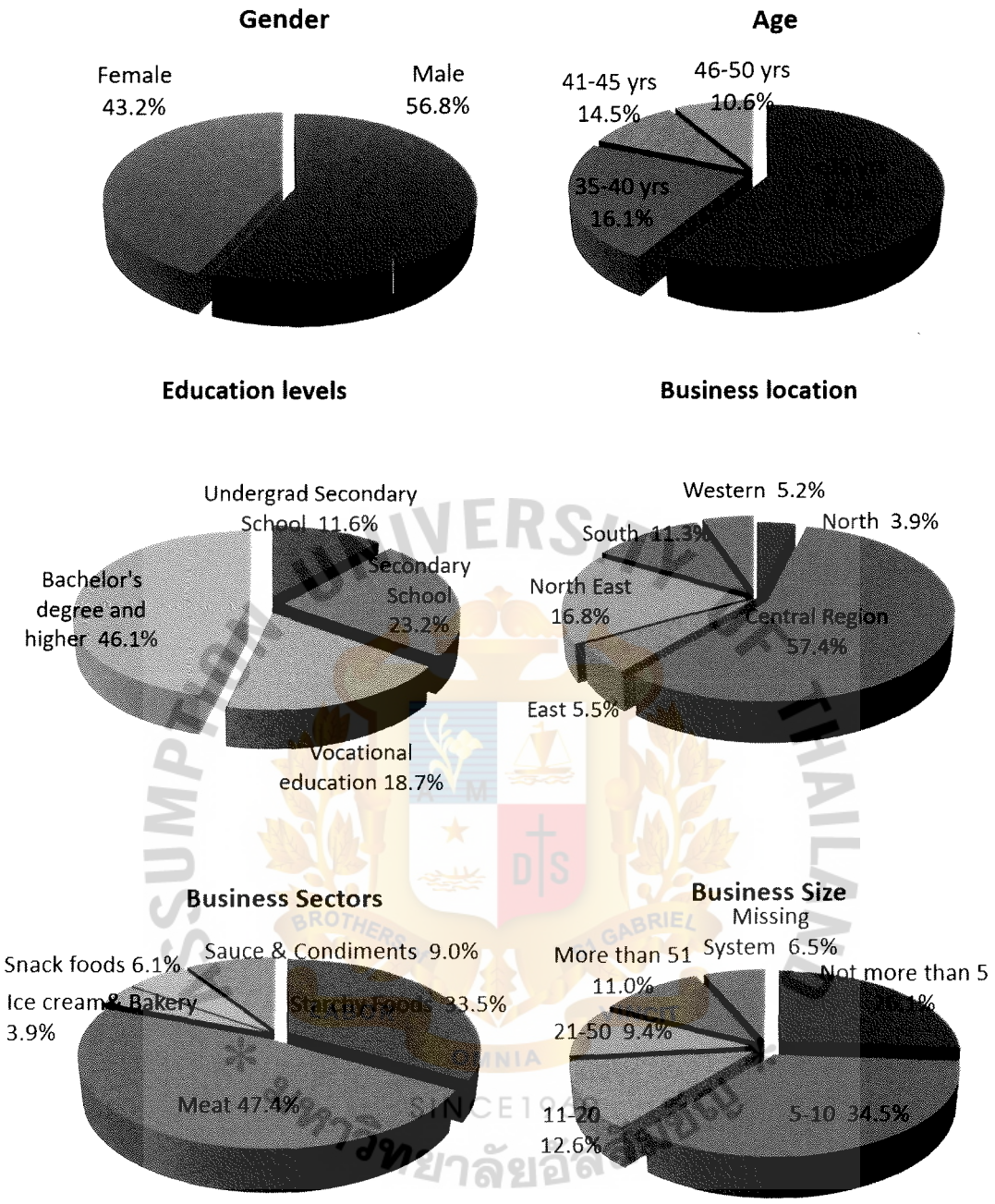


Figure 21: The Demographic Profile of the Respondents

3.2 Learners' Opinion and Attitude on the eLearning Model for the Food Industry SMEs

The opinion and attitude survey of SME entrepreneurs toward the MONARCHIST model learning experience consisted of the recognition of eLearning and applications for management. In order to evaluate the survey results, a five-point

Likert scale was used to measure 20 items on six aspects of model perception: lesson components, lesson content, system of teaching, graphics and design, interactive design, and internet technical support. These results were interpreted using the following scale: 1.00 to 1.80 = Strongly Disagree; 1.81 to 2.60 = Disagree; 2.61 to 3.40 = Neutral; 3.41 to 4.20 = Agree; and 4.21 to 5.00 = Strongly Agree.

Table 10: Descriptive Statistics for the Learners' Opinion on the MONARCHIST Model

Item	Mean	SD	Interpretation
1. Lesson Component			
1.1 The lesson is appropriate for the purpose	4.34	0.682	Strongly Agree
1.2 Design lessons to be easy to use and clear	4.30	0.709	Strongly Agree
1.3 Clear objectives	4.36	0.681	Strongly Agree
1.4 The lesson is interesting	4.46	0.680	Strongly Agree
2. Lesson Content			
2.1 Content structure is clear	4.36	0.692	Strongly Agree
2.2 Content relationship continuity	4.26	0.732	Strongly Agree
2.3 Content and exercises are appropriate	4.25	0.745	Strongly Agree
2.4 The content is correct and appropriate for the purpose	4.35	0.720	Strongly Agree
2.5 Use appropriate language	4.49	0.662	Strongly Agree
3. System of Teaching			
3.1 Design appropriate lessons, easy tousle and appropriate format	4.46	0.656	Strongly Agree
3.2 Learners can easily control their own learning	4.32	0.765	Strongly Agree
3.3 Feedback is positive for the learner	4.15	0.784	Agree
3.4 Clear program manuals	4.42	0.701	Strongly Agree

Table 10: Descriptive Statistics for the Learners' Opinion on the MONARCHIST Model (Cont.)

Item	Mean	SD	Interpretation
4. Graphics and Design			
4.1 Design the appropriate, beautiful and attractive	4.51	0.642	Strongly Agree
4.2 The graphics reflect the appropriate content	4.36	0.732	Strongly Agree
4.3 Color and font size are clear, beautiful and appropriate	4.35	0.752	Strongly Agree
4.4 Icons and images are appropriate and easy to use	4.45	0.698	Strongly Agree
5. The Interaction Design			
5.1 Compatible with different computer models	4.58	0.611	Strongly Agree
6. The Technical Aspects of the Internet			
6.1 Connecting and accessing the internet	4.41	0.685	Strongly Agree
6.2 The images used for the study are appropriate	4.35	0.699	Strongly Agree

The results of the assessment are presented in Table 10. The participants strongly agreed with all of the items (scores ranged from 4.25 to 4.58), except for item 3.3, for which participants agree with "Feedback is positive for the learner" with a mean score of 4.15. When considering the separate indices of the learners' satisfaction: lesson components, lesson content, system of teaching, graphics and design, the interactive design, and the technical aspects of the Internet, all of these indicated that the participants were very satisfied, with scores ranging from 4.34 to 4.58. The highest scoring index was interactive design (mean = 4.58, SD = 0.611), while the lesson content and system of teaching indices had the lowest mean scores of 4.34. In addition, the overall satisfaction score toward the MONARCHIST model was very satisfied (4.38 out of 5.00).

Table 11: Descriptive Statistics for the Learners' Satisfaction with the MONARCHIST Model Classified by the eLearning Index

Indices	Mean	SD	Interpretation
Lesson Component	4.37	0.487	Very Satisfied
Lesson Content	4.34	0.499	Very Satisfied
System of Teaching	4.34	0.509	Very Satisfied
Graphics and Design	4.42	0.518	Very Satisfied
The Interactive Design	4.58	0.611	Very Satisfied
The Technical Aspects of the Internet	4.38	0.617	Very Satisfied
Overall Satisfaction	**4.38**	**0.421**	**Very Satisfied**

4. Hypothesis Testing with Inferential Statistics

This section contains the results of statistical analyses using MANOVA, the Chi-squared test, a correlation analysis, and the paired *t*-test. The analyses were applied to the research hypotheses, the results and the discussion of which are as follows.

4.1 The Influence of Respondents' Demographic Profile on Satisfaction and Learning Outcomes (Hypotheses 1 to 5).

The demographic profile of SME entrepreneurs: gender, age, education, business sector, and business size was selected to determine whether any of the factors had an influence on satisfaction and learning outcomes with the eLearning experience or not. MANOVA was applied to compare the scores of learners' satisfaction and learning outcome among the factors in their demographic profiles.

Table 12 reports that each *p*-value was greater than 0.05, indicating that there was weak evidence against the null hypothesis, and so null hypotheses 1 to 5 were not rejected. Thus, it can be concluded that the demographic profile of the SME entrepreneurs in terms of gender, age, education, business sector, and business size did not have a significant impact on the satisfaction and learning outcomes with the eLearning experience.

Table 12: MANOVA using Wilk's Lambda to Compare the Mean Scores for Satisfaction and Learning Outcomes among Gender, Age, and Business Size

Demographic Profile	Satisfaction		Learning Outcome		*p*-value
	Mean	SD	Mean	SD	
Gender					
Male	4.37	0.412	31.52	7.905	0.696
Female	4.39	0.434	30.80	9.039	
Age					
Under 35	4.49	0.330	32.64	7.314	
35-40	4.37	0.490	31.08	8.713	
41-45	4.44	0.394	32.00	7.520	0.907
46-50	4.35	0.435	30.88	8.414	
51-55	4.38	0.415	31.10	9.095	
Over 55	4.36	0.402	30.33	8.999	
Education Levels					
Undergrad secondary school	4.36	0.403	31.56	6.425	
Secondary school	4.39	0.408	31.19	8.256	0.419
Vocational education	4.28	0.441	32.43	8.087	
Bachelor's degree and higher	4.41	0.421	30.62	9.070	
Business Sectors					
Starchy foods	4.40	0.372	31.90	7.446	
Meat	4.37	0.445	30.82	8.890	0.689
Ice cream and bakery	4.35	0.514	32.83	2.725	
Snack foods	4.22	0.425	29.68	10.750	
Sauces and condiments	4.42	0.422	31.04	9.195	
Business Size					
Not more than 5	4.34	0.393	32.11	6.456	
6-10	4.38	0.420	31.09	9.290	0.334
11-20	4.37	0.459	30.54	9.646	
21-50	4.56	0.382	32.07	6.622	
More than 51	4.32	0.480	29.71	9.738	

*$p < 0.05$

4.2 Knowledge and Skill Improvement with the MONARCHIST Model (Hypothesis 6).

Pre-testing and Post-testing were carried out to measure the entrepreneurs' improvement in knowledge and/or skill due to the eLearning course. From a total of 40 possible points, the overall mean pre-testing score was 18.86 points compared with the mean post-testing score of 31.21 points, showing a difference of 12.35 points between the pre-testing and post-testing scores. In addition, a paired sample *t*-test

was applied to test the significance of this finding, the results of which showed that the learners' Post-Learning achievement mean scores (Post-testing) were significantly higher than their Pre-Learning (Pre-testing) counterparts at the 0.05 level (Table 13).

Table 13: A Paired Sample *t*-test Compares the Pre-Testing and Post-Testing

Variable	Pre-test Mean (SD)	Post-test Mean (SD)	*t*-value	*p*-value
Knowledge and understanding of entrepreneurs in the management skills. (MONARCHIST model)	18.86 (5.419)	31.21 (8.408)	-23.431	0.000*

$P<0.05$

4.3 The Association between the Topic of Major Interest and Education Levels (Hypothesis 7) and Business Sector (Hypothesis 8).

In response to hypothesis 7, a Chi-squared test was used in test the association between the two categorical variables, namely, the topic of major interest and education level for the sample of entrepreneurs. Table 14 reports the frequency count, percentage, and the *p*-value for the Chi-squared test.

Table 14: Frequency and Chi-Squared Test of Independence between the Topic of Major Interest and Education Levels

Topic of Major Interest	Education Levels								χ^2 (*p*-value)
	Undergrad Secondary School		Secondary School		Vocational Education		Bachelor's Degree and Higher		
	N	%	N	%	N	%	N	%	
Lesson 1	5	13.9	19	26.4	15	25.9	43	30.1	32.965 (0.005)
Lesson 2	6	16.7	8	11.1	9	15.5	24	16.8	
Lesson 3	6	16.7	11	15.3	10	17.2	18	12.6	
Lesson 4	10	27.8	14	19.4	13	22.4	34	23.8	
Lesson 5	9	25.0	18	25.0	11	19.0	9	6.3	
Lesson 6	0	0.0	2	2.8	0	0.0	15	10.5	
Total	36	100.0	72	100.0	58	100.0	143	100.0	

$P<0.05$

Analysis of Table14 revealed that the association between the topic of major interest and education levels of respondents was high. This implied that there was significant association between both variables. The calculated χ^2 value was 32.965, it produced a *p*-value = 0.005, less than the significance level (0.05). Therefore, the null hypothesis (H0) "There was no association between education levels and the topic of major interest", was rejected.

In addition, a factor of business sectors was examined to find out its influence on the topic of major interest. From the Table15 it can be seen that the χ^2 value was 17.342, more than cut of value 0.05 at the 95 % confidence level. Therefore, null hypothesis was accepted and can be concluded that there was no association between business sectors and the topic of major interest.

Table 15: Frequency and Chi-Squared Test of Independence between the Topic of Major Interest and Business Sector

Lesson Interesting	Business Sectors						χ^2 (*p*-value)
	Starchy Foods		Meat		Others		
	N	%	N	%	N	%	
Lesson 1	30	28.8	36	24.5	17	28.8	17.342 (0.067)
Lesson 2	19	18.3	14	9.5	14	23.7	
Lesson 3	12	11.5	25	17.0	8	13.6	
Lesson 4	19	18.3	36	24.5	16	27.1	
Lesson 5	18	17.3	27	18.4	2	3.4	
Lesson 6	6	5.8	9	6.1	2	3.4	
Total	104	100.0	147	100.0	59	100.0	

**P<0.05*

4.4 The Learners' Satisfaction with the Web-based Training Experience (Hypotheses 9 to 15)

According to Table 16, the overall learners' satisfaction score toward the eLearning model was high (4.38 out of 5.00). Pearson's correlation coefficient was applied to measure the relationship between overall satisfaction and the eLearning

aspects (lesson components, lesson content, system of teaching, graphics and design, interactive design, and internet technical support).

Table 16: Pearson's Correlation between the eLearning Aspect Variables

Variables	Pearson's Correlation						
	1	2	3	4	5	6	7
1. Lesson component	1						
2. Lesson content	0.636*	1					
3. System of teaching	0.615*	0.624*	1				
4. Graphics and design	0.652*	0.636*	0.646*	1			
5. Interaction design	0.355*	0.375*	0.428*	0.239*	1		
6. Internet technical support	0.505*	0.514*	0.640*	0.564*	0.327*	1	
7. Overall satisfaction	0.829*	0.854*	0.853*	0.842*	0.476*	0.733*	1

* *Correlation is significant at the 0.05 level (2-tailed).*

The results show that all six specified aspects were significantly related to the overall satisfaction, and thus null hypotheses 9 to 14 were rejected. When investigating the correlation between overall satisfaction and eLearning aspect: lesson content (r = 0.854), system of teaching (r = 0.853), graphics and design (r = 0.842), lesson components (r = 0.829), and internet technical support (r = 0.733), each displayed especially high levels of importance except for interactive design, which a had moderate level of importance.

CHAPTER VI

RESULTS: THE eLEARNING OF MANAGEMENT SKILLS FOR THAI FOOD INDUSTRY SMES

Executive Summary

The main purpose of the study was to develop a web-based learning model in Small and Medium Enterprises (SMEs) management skills for Thai Food Clusters called based on the MONARCHIST model. The model was constructed based on the needs of learners and experts' recommendations by using the LMS to facilitate an online course. The model consisted of the nine chapters, including business management content, exercises, and exams. The efficiency of the eLearning model developed was analyzed as well as the satisfaction of the Thai Food Industry SME entrepreneurs toward the LMS. The details of the model construction can be concluded as shown in Figure 22.

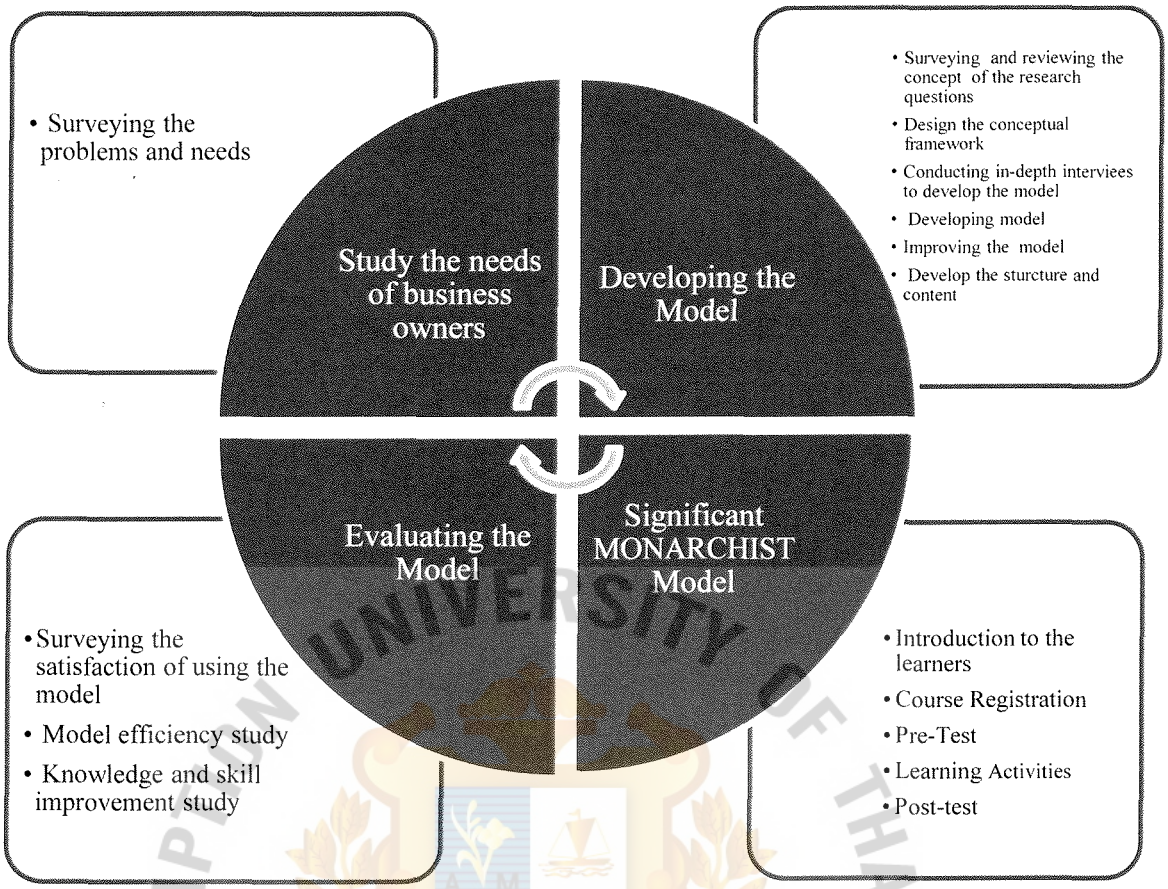


Figure 22: The MONARCHIST Model for Thai Food Cluster

In this study, a mixed method design that integrated qualitative (In-Depth Interviews) and quantitative (Sample Survey) approaches was utilized. The data were collected from SME entrepreneurs, working in five sectors of the food production area. A sample of 305 entrepreneurs was drawn from a population of 1,274 by employing a stratified systematic sampling technique.

The population was SME entrepreneurs in the food industry from the starchy foods, meat, ice cream and bakery, snack foods, and sauces and condiments sectors, covering the North, Northeast, Middle, East, West, and South of Thailand.

Descriptive statistics, paired *t*-test, and correlation were used to measure the importance of the satisfaction components.

The research findings were that the MONARCHIST model met the 80/80 efficiency criterion. Additionally, participants showed a significant improvement in their knowledge in business management after course completion ($p<0.05$). Furthermore, the satisfaction score of the learners toward the MONARCHIST model was high (4.38 out of 5.00). These results indicate that the MONARCHIST model is effective and practical for implementation.

1. Introduction

Based on the researcher's experience of over 30 years as well as the needs to survey of SME entrepreneurs from the Thai food industry, it was found that those who reviewed and answered the questionnaires were interested in discovering more about filling the gap in management knowledge. The researcher developed the MONARCHIST model from the basic concepts of 5M-Management and Ishikawa's 5W1H method (doing what, where, when, who, why, and how). Moreover, it was found that the problem of working in almost all SMEs is a one-man operation that must perform all of the functions in the MONARCHIST model in the Figure 23.

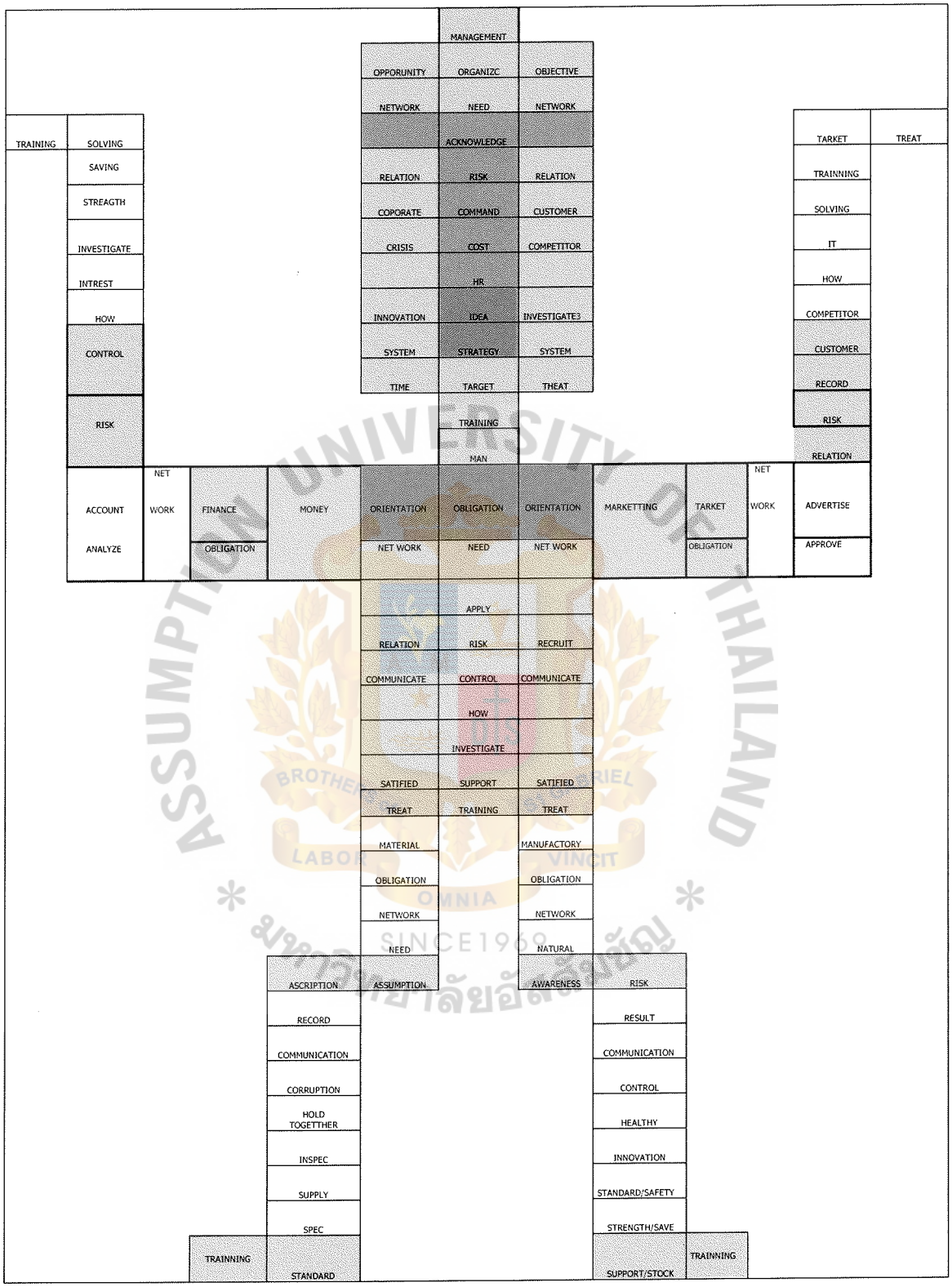


Figure 23: The Functions in the MONARCHIST Model

The MONARCHIST model has been created conceptually from the use of management principles based on the work of a sole owner who must be cognizant with all aspects of business and be able to understand the management of his/her business by using this model. Therefore, employing this idea to develop the model was the basis of this research. This model was applied via online lessons (eLearning) for SME entrepreneurs to better their management knowledge, and statistically testing their responses to the eLearning model showed them to be positive overall.

1.1 The Objective of the Model

The purpose of the MONARCHIST model was to gather key principles used in business management and use them as a guideline for a business management eLearning model.

1.2 Expected Outcome of the eLearning Model

With the characteristics of the web-based eLearning model in SME management skills, the students can learn the lessons at any place and any time, which gives them the opportunity to gain knowledge and skills in business management. To increase learning efficiency, the researcher recommends that students find the best environment conducive to learning for them to maximize the benefits of the eLearning experience. As a starting point, effective practice with eLearning can be based on the same criteria as effective learning practice in generally. The approach should engage the learners in the learning process, encourage independent learning skills, develop their skills and knowledge, and stimulate further learning. In the broadest sense, effective eLearning should make use of the right resources, the right mode (or blend of modes) in delivery, the right context, the right learners, and the right level of support. Designing the learning activities should always coincide with the intended learning outcomes.

2. Details of MONARCHIST Model

2.1 Component of Model

The components of MONARCHIST model which developed an eLearning model in SMEs Management Skills for Thai Food Industry. The model was constructed based on the personal information of learners and experts' comments.

This thesis provides documentation of the perceptions and satisfactions of the Thai Food Industry SME entrepreneurs toward the utilization of the developed eLearning model based on the MONARCHIST model and created by using OBECLMS 2.3-2.7 (OBEC, n.d.). An eLearning system is the management system of teaching through the Internet or sometimes called the real classroom at a convenient time. The MONARCHIST model comprised four major components, namely lesson content, nine lessons, an LMS, a centralized LMS in which each component was designed to be interconnected systematically and work together harmoniously. First, the lesson content is considered as the most important. Second, there are nine lessons, including exercises and exams. Third, the LMS. Fourth, a centralized LMS defining the lesson content sequence, sending lessons through the computer network to the students to evaluate the success of the control lesson, and support all of the services provided to the learner.

The components of the MONARCHIST model are presented in Figure 24.

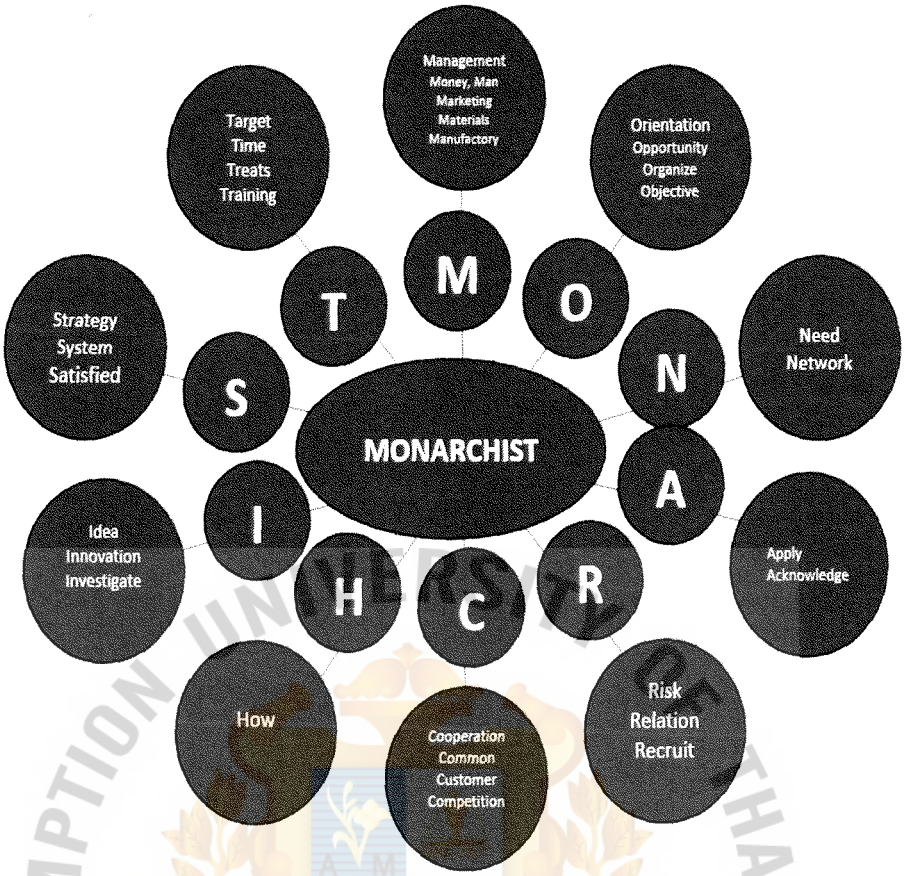


Figure 24: The Components of the MONARCHIST Model

Table 17: The Lessons, Topics, and Content of the MONARCHIST Model

Lesson	Topics	Materials/ Support	Topics	Contents and learning objectives
1	Introduction to SMEs in Thailand	MS Word	Introduction to MONARCHIST model	To introduce about the MONARCHIST model
2	Overview of MONARCHIST model	MS Word	SMEs and MONARCHIST model	To provide background of Thailand Food Industrials SMEs.
3	Management	MS Word	Management	To explain how to management SMEs business.
4	Man	MS Word	Man	To explain human resource in the organization include the problems and the guideline for the results.
5	Money	MS Word	Money	To explain the income and outcome on running SMEs business.

Table 17: The Lessons, Topics, and Content of the MONARCHIST Model (Cont.)

Lesson	Topics	Materials/ Support	Topics	Contents and learning objectives
6	Marketing	MS Word	Marketing	To explain the target of marketing include the ways to solve the problems in marketing sections.
7	Materials	MS Word	Materials	To explain how to prepare the materials on business and manufacturing.
8	Manufacturing	MS Word	Manufacturing	To explain the general process in manufacturing.
9	Business Plan	MS Word	Business Plan	To explain the business plan and guide the way of running business.

2.2 The Logical Steps of the MONARCHIST Model

The details of the eLearning model in management skills for the Thai food SME cluster are described in Table 18.

Table 18: The Steps in Developing the MONARCHIST Model for the Thai Food Industry

Step	Sample size	Parameters	Description
1. Review of related literature of the Thai food industry	≈70 Articles	Concepts, principles, and theories	The contents of the Thai food industry, Method of eLearning, eLearning technology, Systematization of potential origins of problems.
2. Develop a conceptual framework for an eLearning model development	3 Variables (Independent, Intermediate, Dependent)	Conceptual framework for an eLearning model development	- 5 Independent Variables - 7 Intermediate Variables - 2 Dependent Variables

Table 18: The Steps in Developing the MONARCHIST Model for the Thai Food Industry (Cont.)

Step	Sample size	Parameters	Description
3. Study the needs of business owners to manage their business	30 Business owners	The needs of business owners to manage their business	- Financial management for small businesses - Information management to access funding sources. - Personnel management for the strength of the business - Knowledge management including sales, purchasing - Production management to run a business that needs growth.
4. Interview experts	3 Experts	Experts opinion	Consults expert in field of management, education, and IT.
5. Develop the model entitled "MONARCHIST"	4 Components	Each component was designed to be interconnected systematically and the system's components work together harmoniously	Four major model components - The content of the lesson - The lesson - LMS - A centralized LMS
6. Test the efficiency of MONARCHIST model	- Individual (3) - Small group (30) - Field (305)	The model met the 80/80 efficiency criterion.	The efficiency of the process and product met the standard criterion of 80/80 and was thus proven efficient.
7. Revise and finalize the MONARCHIST model			The model was implemented and reviewed for sustainable model

2.3 The MONARCHIST Model System

The system of the MONARCHIST model focuses on the lesson content, which comes from the utilization of the MONARCHIST model. It is a model for SMEs to learn and research from the lessons and test the knowledge obtained afterward. The lessons are for business management in terms of finance, personnel, production, raw materials, and marketing. The students can study and test themselves at anytime and anywhere by using a variety of tools accessed to the Internet: computers, notebooks, tablets, cell phones, etc. (see Figure 25).

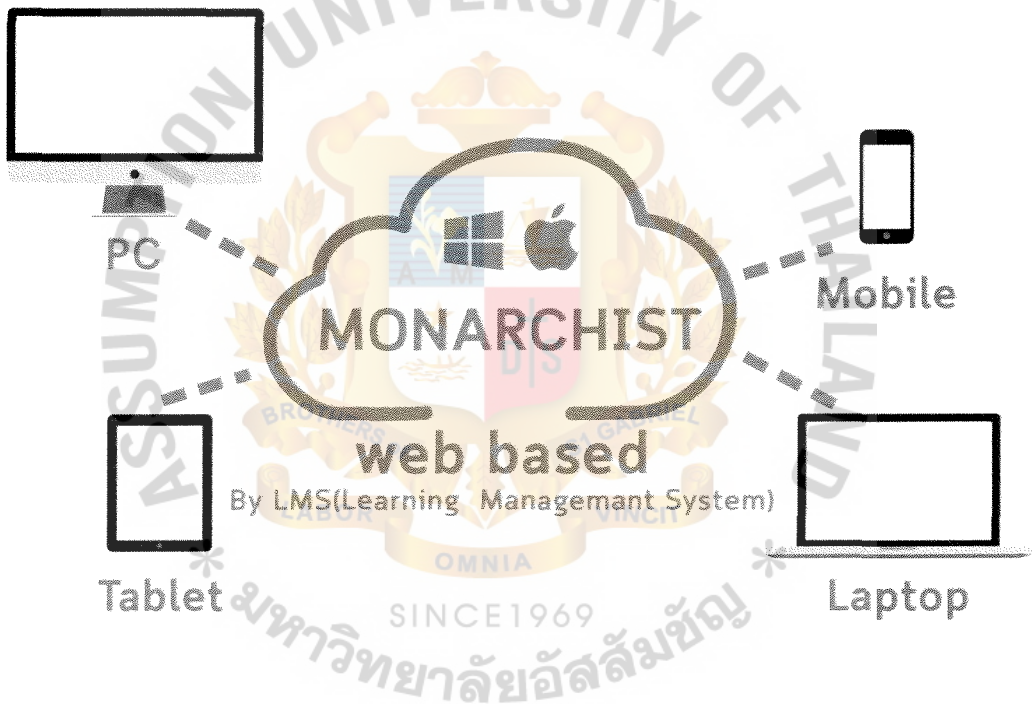


Figure 25: The MONARCHIST Model System

3. The Implementation of the MONARCHIST Model

After the model had been tested and validated, the implementation consisted of the following steps:

Step 1: The learners registered to obtain a username, password and individual code within a day.

Step 2: After closing and registration, the learners completed the online pre-test within 40 minutes.

Step 3: The learners learned the business management lesson and completed the post-test for each lesson within 5 minutes of completing it.

Step 4: The learners completed the nine lessons within a month.

Step 5: The learners completed the post-test within 40 minutes.

Step 6: The learners completed the satisfaction survey on using of the MONARCHIST model within 15 minutes.

The process flow in each step is displayed in Figure 26.

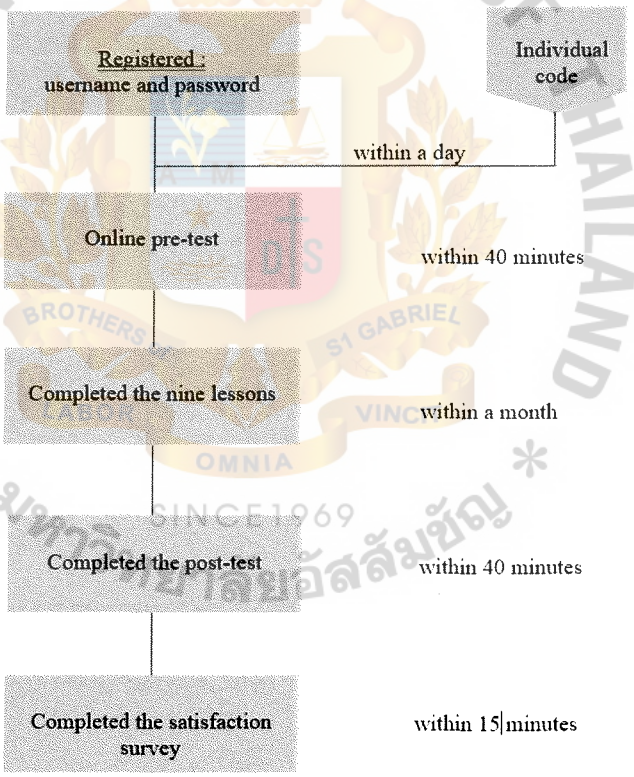


Figure 26: The Implementation of the MONARCHIST Model

3.1 Executive Commitment

This research cannot be completed if the university does not cooperate with the advisors. Please provide support and feedback to complete the work perfectly. The 305 participants and other stakeholders participated in the study. The researcher suggests that the project manager lacked an understanding of the range of responsibilities as an advocate of participation in the pre-final defense phase as well as the initial stages of the project. What is told is how to participate, while the research continues. However, for the researcher, what is happening outside is a very powerful advocate. Here is advice for those who still have a vision for a particular project that inspires people around them. In fact, for research activities, decision-making is not a one-way process, rather one that requires cooperation between all parties to achieve the conclusion. The above characteristics are the sole responsibility of the executor of the project. Actually, a project manager must exhibit the same characteristics, and there is no precedent for this. If the implementation of the project is different from what it should be, it will reduce its effectiveness.

3.2 Infrastructure of Facilities

The MONARCHIST model lesson was designed by the researcher in eLearning format from a collection of powerful design elements due to the expansion of IT technology trends. In the design process, it is important to have an infrastructure with the right facilities. With a combination of diverse educational program teams and domain experts, participation in infrastructure deployment and centralized learning systems offered by the institution can be used (OBECLMS in this case) to help make self-learning a better learning experience. Moreover, it can reach as many people as possible via the Internet by delivering context-influenced learning as a focal point for

educational designers and support the organization's objectives for better teaching and lower material costs.

3.3 Successful Conditions

The success of this research is due to the survey of the Thai Food industry operators across the country and the experience of the researcher in this field of more than 30 years. It was found that the SMEs in the Thai Food industry continue to have a shortfall in management skills, which is preventing them from growing and being competitive in the market, and funding sources to support turnover and other administration. The concept of management from various sources was collected to form the MONARCHIST model to match the world at the present time in terms of lack of time and money to invest in knowledge. Therefore, the main elements of a research study in the form of eLearning to address this were introduced in the MONARCHIST model. Trial lessons with individual and small group consisting of discussions with senior management and educational experts to identify key success factors was followed by a field survey of 305 participants. The most common factors in successful project delivery are:

1. Commitment to the success of the project: The researcher has a firm intention to succeed and is confident of succeeding in delivering this research.
2. Proven methods and tools: From prototype experiments with the use of three tryouts and through expert peer review.
3. Applying appropriate standards, from correction and experimentation.
4. Supporting organizations for effective implementation.
5. The participants were willing to carry out the eLearning.

CHAPTER VII

CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS

1. Conclusions

The significance of this study is the contributions of eLearning to teach management skills to entrepreneurs in the Thai Food Industry SME Cluster and the impact of such a program on their respective business performance. The aim of this research was to contribute to a broader understanding of business management skills by using a Web-Based eLearning model for the Thai Food Industry SME Cluster. There were four objectives in this study:

1) To study the management skills of Thai Food Industry SME entrepreneurs in Thailand.

2) To develop an eLearning model in SME Management Skills for the Thai Food Industry clusters.

3) To investigate the effectiveness of the eLearning model.

4) To assess the satisfactions of the Thai Food Industry SME entrepreneurs toward the utilization of the eLearning model.

A mixed methods research design that integrated qualitative and quantitative techniques was applied in the study. To determine the content validity of instruments, a panel of three experts was used. Additionally, reliability testing of the questionnaire was performed to measure its internal consistency using Cronbach's alpha. The eLearning model based on the MONARCHIST model consisted of nine chapters, including learning content, exercises, and exams. The details of content are described in Table 19.

Table 19: The Topics of the MONARCHIST Model

Lesson	Topics	Description
1	Introduction to SMEs and MONARCHIST model	- Introduction of SMEs - The problems and limitations of SMEs
2	MONARCHIST model	- MONARCHIST model
3	Management	- Business management
4	Man	- Problems of human management
5	Money	- Financial in SMEs
6	Marketing	- Marketing plan
7	Material	- Material management
8	Manufacturing	- Production plan - Products
9	Business Plan	- Internal data and external data - How to make the business plan

The efficiency of the developed model was tested using the 80/80 standard efficiency criterion. The results revealed that the efficiency of the process and product for the individual and small groups test was below this, and so the lessons were revised by rearranging of the content categories. Moreover, explanations, examples, and question improvements were added at the end of the lessons in response to feedback from the learners. Finally, the efficiency of the process and product improved to 84.14/82.83, which was above the criteria of 80/80.

The 305 entrepreneurs from the five business sectors in six areas of Thailand were invited to try the MONARCHIST model. The majority of the sample was male (56.8%). Most of the participants were over 55 years old (23.8%), followed by 35-40 years old, 41-45 years old, 51-55 years old, 46-50 years old, and under 35 years old (19.5, 17.6, 16.4, 12.9 and 9.8% respectively). Most of them held a bachelor's degree and higher (46.2%), followed by secondary school (23.3%), vocational education

(18.8%), and undergraduate secondary school (11.7%). About one-third of the respondents had an ice cream and bakery business (37.0%) followed by meat (20.7%), starchy foods (18.7%), sauces and condiments (14.4%), and snack foods (9.2%). In terms of business size, 36.7% of SMEs had 5-10 workers, followed by 1-4 workers (27.9%),11-20 workers (13.4%), more than 51 workers (11.8%), and 21-50 workers (10.2%).

The data analysis were intended to answer the following research questions:

1) How are the management skills in the Thai Food Industry SMEs?

According to the outcomes of the in-depth interviews for the needs assessment, the biggest problem faced by entrepreneurs was financial (i.e. poor cash flow, inaccessibility to financial sources, and lack of securities to guarantee financial loans, no clarity in showing their revenue stream, and poor accounting system concerning the source of revenue). This was followed by problems with HR, management, marketing, manufacturing, and material at 96.7, 93.3, 90.0, 86.7, 23.3, and 10.0%, respectively. Therefore, the learners' needs were accurate financial management for small businesses, information management to access funding sources, personnel management to improve the strength of the business, knowledge management on sales and purchasing, and production management. The results of the hypothesis testing considering the factors related to the topic of major interest are shown in Table 20.

Table 20: Hypothesis Testing Results for the Association between Variables

Hypotheses	Result	Method
H7	There was an association between education levels and the topic of major interest.	Chi- Square test
H8	There was no association between business sectors and the topic of major interest.	

2) How is the eLearning model perceived by the difference in demographic characteristics and socioeconomic status of the Thai Food Industry SME entrepreneurs?

Based on the descriptive analysis reported in Table 12, the satisfaction scores for females were higher than males, while learning outcome scores for males were higher than females. The respondents of under 30 years of age were the most satisfied and were more likely to achieve the prescribed learning outcomes compared to learners in the other age groups.

Additionally, the learners with a bachelor's degree or higher had the highest satisfaction scores but the lowest learning outcomes. Considering each business sector and business size aspects, the satisfaction scores for entrepreneurs from the sauces and condiments sector and with enterprises of 21-50 employees were the highest. Mean while, the learning outcomes scores for entrepreneurs from the ice cream and bakery sector and with enterprises of 0-5 employees were the highest.

However, the results of the hypothesis testing revealed that the demographic profile of SME entrepreneurs (gender, age, education, business sector, and business size) did not have a significant impact on satisfaction and learning outcomes with the eLearning experience (see Table 21).

Table 21: Hypothesis Testing Results of the Difference in Means among Variables

Hypotheses	Result	Method
H1	The mean scores of satisfaction and learning outcomes with eLearning experience were not significantly different between genders.	MANOVA
H2	The mean scores of satisfaction and learning outcomes with eLearning experience were not significantly different among age groups.	
H3	The mean scores of satisfaction and learning outcomes with eLearning experience were not significantly different among education levels.	
H4	The mean scores of satisfaction and learning outcomes with eLearning experience were not significantly different among business sectors.	
H5	The mean scores of satisfaction and learning outcomes with eLearning experience were not significantly different among business sizes.	

3) How does eLearning contribute to the improvement of the management skills of the entrepreneurs?

The data indicated that the overall mean pre-testing score was 18.86 points compared with the mean post-testing score of 31.21 points, i.e. a difference of 12.35, which means an improvement in the mean score. Moreover, a paired sample *t*-test was performed to determine whether the mean difference between pre- and post-testing was statistically significantly different from zero. The results of a hypothesis test are summarized in Table 22.

Table 22: Hypothesis Testing of the Difference in Means between Pre-and Post-Testing

Hypotheses	Result	Method
H6	The learners' Post-Learning achievement mean scores (Post-test) were significantly higher than their Pre-Learning (Pre-test) counterpart achievement	Paired samples *t*-test

4) What is the level of satisfaction with eLearning model among the entrepreneurs?

According to Table 11, the overall learners' satisfaction score toward the eLearning model was high (4.38 out of 5.00). Pearson's correlation coefficient was used to measure the magnitude of the relationship between two linearly measured variables. Ordered from the highest to lowest, the results were lesson content (r = 0.854), system of teaching (r = 0.853), graphics and design (r = 0.842), lesson components (r = 0.829), internet technical support (r = 0.733), and interactive design (r = 0.476). The details of the hypothesis testing results are presented in Table 23.

Table 23: Hypothesis Testing Results of the Differences in Means among the Variables

Hypotheses	Result	Method
H9	There was a relationship between lesson component and overall satisfaction.	Correlation
H10	There was a relationship between lesson content and overall satisfaction.	
H11	There was a relationship between system of teaching and overall satisfaction.	
H12	There was a relationship between graphics and design and overall satisfaction.	
H13	There was a relationship between interaction design and overall satisfaction.	
H14	There was a relationship between internet technical support and overall satisfaction.	

2. Discussion

From the empirical evidence, it can be assumed the MONARCHIST model can be used to improve the management skills of Thai food entrepreneurs because it covers the principle guidelines as well as gives examples that the entrepreneurs can apply to and manage their businesses. The lesson content of the MONARCHIST

model was developed based on the needs of the learners and experts' recommendations and an LMS was used to facilitate the online course. The MONARCHIST model met the 80/80 efficiency criterion and was thus proven efficient. Additionally, the learners' Post-Learning achievement mean scores (Post-testing) were significantly higher than their Pre-Learning (Pre-testing) counterparts at the 0.05 significance level.

Moreover, the learners had a positive attitude toward all indices of the MONARCHIST model for the Food Industry SME cluster: lesson components, lesson content, system of teaching, graphics and design, interactive design, and technical aspects of the Internet. This corresponded well to the level of satisfaction with the MONARCHIST model, which was found to be high (4.38 out of 5.00). These results indicate that the MONARCHIST model is effective and practical for implementation.

3. Recommendations

Overall, the researcher is very proud to have carried out this research successfully and suggests that this research could be useful for studies related to other SME clusters.

3.1 Implementation

The most difficult aspect of this research study was to collect the data and then analyze them statistically because of the large amount of data collected and their distribution. It was imperative that the data were quickly collected in accordance with the timetable of the research and that a plan was established that included organizing teams and collecting information. It was important to be well prepared.

The main issue in the use of eLearning is how to measure its effectiveness in terms of the benefits that can be obtained from it. With this, the researcher recommends that future scholars formulate a method to measure the effect of

eLearning through controlled experimentation. For eLearning, the researcher understands that different people learn at different rates and respond better to different approaches. Hence, the researcher recommends that students find the best environment conducive to learning for them to maximize the benefits of eLearning. As a starting point, effective practice with eLearning can be based on the same criteria as the effective practice in learning generally. The approach should engage the learners in the learning process, it should encourage independent learning skills as well as develop the learner's skills and knowledge, and lastly, it should stimulate further learning. In the broadest sense, effective learning for eLearning should make use of the right resources, the right mode (or blend of modes) in delivery, the right context, the right learners, and the right level of support. Designing the learning activities should always coincide with the intended learning outcomes. For instance, a learner whose main goal is to learn a new skill needs to participate in learning activities that will promote that skill, while a learner who wishes to understand some new information should make use of a module-based activity rather than a simulation.

3.2 Future Study

Future research could be conducted in other food manufacturing sectors such as health foods, food of the elderly, etc. to obtain more data to make this study more comprehensive. Moreover, a study in the future could make an appropriate eLearning model and develop it to higher levels.

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APPENDICES

Appendix A

eLearning Participants Questionnaire

Demographic characteristics	
Sex	Male Female
Age	…….. years old
Education Levels	1. Undergrad secondary school 2. Secondary school 3. Vocational education 4. Bachelor's degree 5. Higher than Master's degree
Business Sectors	1. Starchy foods 2. Meat 3. Ice cream& bakery 4. Snack foods 5. Sauces & condiments
Business Size	1. Not more than 5 2. 5-10 3. 11-20 4. 21-50 5. 51-100 6. 101-200
Lesson Interesting	1. Lesson 1 Introduction to MONARCHIST MODEL 2. Lesson 2 SMEs and MONARCHIST MODEL 3. Lesson 3 Management 4. Lesson 4 Man 5. Lesson 5 Money 6. Lesson 6 Marketing 7. Lesson 7 Material 8. Lesson 8 Manufacturing 9. Lesson 9 Business Plan

Part 2: Comments on Electronic Lessons MONARCHIST Model

Please mark √ in the box closest to your comment. By the rules: Ratings based on opinion level: 5 = strongly agree, 4 = agree,3 = neutral, 2 = disagree, 1 = strongly disagree

ตอนที่ 2 ความคิดเห็นที่มีต่อบทเรียนอิเล็กทรอนิกส์ MONARCHIST Model

คำชี้แจง โปรดทำเครื่องหมาย √ ลงในช่องตรงกับความคิดเห็นของท่านมากที่สุดโดยมีหลักเกณฑ์การให้คะแนนตามระดับความคิดเห็นดังนี้ 5 = เห็นด้วยอย่างยิ่ง 4 = เห็นด้วย 3 = ไม่แน่ใจ 2 = ไม่เห็นด้วยและ 1 = ไม่เห็นด้วยอย่างยิ่ง

รายการประเมิน (Curriculum)	ระดับความคิดเห็น (List of opinions)				
	5	4	3	2	1
1. ส่วนประกอบของบทเรียน (Lesson Component)					
1.1 บทเรียนมีความเหมาะสมตามวัตถุประสงค์ 1.1 The lesson is appropriate for the purpose					
1.2 ออกแบบบทเรียนให้ใช้งานง่ายและมีความชัดเจน 1.2 Design lessons to be easy to use and clear					
1.3 วัตถุประสงค์ชัดเจน 1.3 Clear objectives					
1.4 บทเรียนมีรูปแบบน่าสนใจ 1.4 The lesson is interesting					
2. ส่วนเนื้อหาของบทเรียน (Lesson Content)					
2.1 โครงสร้างเนื้อหามีความชัดเจน 2.1 Content structure is clear					
2.2 เนื้อหามีความสัมพันธ์ต่อเนื่องกัน 2.2 Content relationship continuity					
2.3 ลำดับเนื้อหาและแบบฝึกหัดได้เหมาะสม 2.3 Content and exercises are appropriate					
2.4 เนื้อหาถูกต้องและเหมาะสมตามวัตถุประสงค์ 2.4 The content is correct and appropriate for the purpose					
2.5 ใช้ภาษาถูกต้องเหมาะสมกับผู้เรียน 2.5 Use the correct language to suit the learner					
3. ระบบการสอน (System of Teaching)					
3.1 ออกแบบบทเรียนเหมาะสมง่ายต่อการใช้งานและรูปแบบเหมาะสม 3.1 Design appropriate lessons, easy to use, and appropriate format					
3.2 ผู้เรียนควบคุมการเรียนด้วยตนเองได้ง่าย 3.2 Learners can easily control their own learning					
3.3 ผลป้อนกลับมีความเหมาะสมกับผู้เรียน (เชิงบวก) 3.3 Feedback is positive for the learner					
3.4 เอกสารคู่มือการใช้โปรแกรมชัดเจน 3.4 Clear Program Manuals					

รายการประเมิน (Curriculum)	ระดับความคิดเห็น (List of opinions)				
	5	4	3	2	1
4. กราฟิกและการออกแบบ (Graphics and Design)					
4.1 ออกแบบหน้าจอเหมาะสมสวยงามและน่าสนใจ 4.1 Design the appropriate Beautiful and attractive					
4.2 ภาพกราฟิกเหมาะสมชัดเจนสอดคล้องเนื้อหา 4.2 The graphics reflect the appropriate content					
4.3 ขนาดสีตัวอักษรชัดเจนสวยงามอ่านง่ายเหมาะสมกับผู้เรียน 4.3 Color and font size are Clear, beautiful and Appropriate					
4.4 ไอคอนและรูปภาพมีความเหมาะสมใช้งานง่าย. 4.4 Icons and images are appropriate and easy to use					
5. การออกแบบปฏิสัมพันธ์ (The interactive Design)					
5.1 ให้ข้อเสนอแนะหรือให้ความช่วยเหลือตามความจำเป็น 5.1 Provide feedback or provide assistance as needed					
6. ด้านเทคนิคของอินเทอร์เน็ต (The Technical Aspects of the Internet)					
6.1 การเชื่อมเข้าต่อและเข้าสู่บทเรียนทางอินเทอร์เน็ต 6.1 Connecting to and accessing the internet					
6.2 แหล่งข้อมูลสนับสนุนการเรียนเหมาะสม 6.2 Appropriate learning resources					

Part 3: Satisfaction with Electronic Lessons MONARCHIST Model

Please mark √ in the box closest to your comment. By the rules: Ratings based on opinion level: 5 = very satisfied, 4 = satisfied, 3 = neither satisfied or dissatisfied, 2 = dissatisfied,1 = very dissatisfied

ตอนที่ 3 ความพึงพอใจที่มีต่อบทเรียนอิเล็กทรอนิกส์ MONARCHIST Model

คำชี้แจง โปรดทำเครื่องหมาย √ ลงในช่องตรงกับความคิดเห็นของท่านมากที่สุดโดยมีหลักเกณฑ์การให้คะแนนตามระดับความคิดเห็นดังนี้ 5 = พึงพอใจมากที่สุด 4 = พึงพอใจมาก 3 = พึงพอใจปานกลาง 2 = พึงพอใจน้อยและ 1 = พึงพอใจน้อยที่สุด

ดัชนีความพึงพอใจ Satisfied Index	**The satisfactions**				
	5	4	3	2	1
1. ความพึงพอใจกับบทเรียน 1. Satisfaction with the Lesson Component.					
2. ความพึงพอใจในเนื้อหาบทเรียน 2. Satisfaction with the Lesson Content					
3. ความพึงพอใจต่อระบบการเรียนการสอน 3. Satisfaction with the System of Teaching.					
4. ความพึงพอใจด้านกราฟิกและการออกแบบ 4. Satisfaction with Graphics and Design					
5. ความพึงพอใจในการออกแบบปฏิสัมพันธ์ 5. Satisfaction with the Interactive Design.					
6. ความพึงพอใจด้านเทคนิคของอินเทอร์เน็ต 6. Satisfaction with the Technical Aspects of the Internet					
ความพึงพอใจโดยรวม Overall satisfaction					

Appendix B

The knowledge and understanding before and after training.

Please mark √ in the box that corresponds to your answer.

No	Question of management	Yes	No
1	You use 5W-1W as a business management business.		
2	You understand the business plan of the business.		
3	You have policies and regular meetings.		
4	You check cash all the time.		
5	You use 7 C to operate.		
6	You have to use Time Management in the management.		
No	**Question of Man**	**Yes**	**No**
7	Do you think that human resources in the food industry mean workers?		
8	You have a duty statement for every employee.		
9	You have motivated employees.		
10	You have to check the work of the staff at all times.		
11	You have to schedule training staff to meet the duties.		
No	**Question of Money**	**Yes**	**No**
12	You bring money from business to use when you and your family.		
13	You buy everything from cash leftovers.		
14	The flow of the business out of financial status.		
15	The money from the sale of our products is money.		
16	You have to record income - expenses every day.		
17	You have to make a purchase record - selling the cost - profit every day.		
18	The liquidity of the business and money are the strengths of doing business.		

No	Question of Marketing	Yes	No
19	Branding is an important part of marketing.		
20	Marketing objectives are not as important as sales.		
21	Marketing plans are not necessary when producing products and then selling them.		
22	Product presentation is marketing.		
23	You always record sales and customer history.		
24	Easy Buyers The price is a risk of the market.		
25	Good marketing when blamed on the product stopped selling.		
No	**Question of Material**	**Yes**	**No**
26	You control raw materials in accordance with GMP standards.		
27	You have planned your purchase by anticipation.		
28	You have a record of every purchase.		
29	You always pay for goods late.		
30	You have to check raw material and save every month		
No	**Question of Manufacture**	**Yes**	**No**
31	You have access to inputs, transformations and export factors.		
32	You have a production schedule every month.		
33	You have to analyze marketing to schedule production.		
34	You have to check health, cleanliness, and staff every day.		
35	You understand GMP HACCP very well.		
No	**Question of Business Plan**	**Yes**	**No**
36	You choose to do business without targeting the market.		
37	You have provided basic business information.		
38	You have made a detailed record of the business.		
39	You have a competitor analysis.		
40	You have a good attitude in doing business.		

Appendix B

แบบประเมินความรู้และความเข้าใจก่อนอบรมและหลังการอบรม

คำชี้แจง โปรดทำเครื่องหมาย √ ลงในช่องที่ตรงกับคำตอบของท่าน

ลำดับ	คำถามบทเรียน Management	ใช่	ไม่ใช่
1	ท่านใช้ 5W-1W เป็นหลักการดำเนินธุรกิจทางด้านการบริหารกิจการ		
2	ท่านเข้าใจการทำแผนธุรกิจ (Business Plan) ของกิจการ		
3	ท่านมีการกำหนดนโยบายและประชุมงานสม่ำเสมอ		
4	ท่านทำการตรวจสอบเงินสดตลอดเวลา		
5	ท่านใช้ 7 C ในการดำเนินกิจการ		
6	ท่านมีการใช้การบริหารเวลา (Time Management) ในการบริหารงาน		
ลำดับ	**คำถามบทเรียน Man**	**ใช่**	**ไม่ใช่**
7	ท่านคิดว่าทรัพยากรบุคคลในอุตสาหกรมผลิตอาหารหมายถึงคนงานอย่างเดียว		
8	ท่านมีการแจกแจงหน้าที่ให้พนักงานทราบทุกครั้ง		
9	ท่านมีการให้แรงจูงใจกับพนักงาน		
10	ท่านมีการตรวจสอบการทำงานของพนักงานตลอดเวลา		
11	ท่านมีการจัดเวลาฝึกอบรมพนักงานให้ตรงกับหน้าที่		
ลำดับ	**คำถามบทเรียน Money**	**ใช่**	**ไม่ใช่**
12	ท่านนำเงินที่เกิดจากธุรกิจไปใช้เมื่อท่านและครอบครัวต้องการ		
13	ท่านซื้อทุกอย่างจากการที่เหลือเงินสด		
14	ระบบการไหลเข้าออกของกิจการแจงสถานะทางการเงิน		
15	เงินที่ได้จากการขายสินค้าเป็นเงินของเรา		
16	ท่านมีการทำบันทึกรายรับ-รายจ่ายทุกวัน		
17	ท่านมีการทำบันทึกการซื้อ-การขายต้นทุน-กำไรทุกวัน		
18	สภาพคล่องของกิจการและการมีเงินเป็นจุดแข็งของการทำธุรกิจ		
ลำดับ	**คำถามบทเรียน Marketing**	**ใช่**	**ไม่ใช่**
19	แบรนด์สินค้าเป็นส่วนสำคัญของการตลาด		
20	วัตถุประสงค์ทางการตลาดไม่สำคัญเท่าขายสินค้าได้		
21	แผนการตลาดไม่มีความจำเป็นเมื่อผลิตสินค้าแล้วขายได้		
22	การนำเสนอสินค้าเป็นการโฆษณาทางด้านการตลาด		
23	ท่านมีการทำบันทึกการขายและประวัติลูกค้าเสมอ		
24	ลูกค้าซื้อของง่ายเพราะราคาถูกเป็นจุดเสี่ยงของการตลาด		
25	การตลาดที่ดีเมื่อถูกตำหนิเรื่องสินค้าก็หยุดขาย		

ลำดับ	คำถามบทเรียน Material	ใช่	ไม่ใช่
26	ท่านมีการควบคุมวัตถุดิบตามมาตรฐาน GMP		
27	ท่านมีการวางแผนการสั่งซื้อโดยการคาดการล่วงหน้า		
28	ท่านมีการบันทึกการซื้อทุกครั้ง		
29	ท่านมักทำการชำระเงินค่าสินค้าล่าช้าเสมอ		
30	ท่านมีการตรวจนับวัตถุดิบคงเหลือและบันทึกทุกเดือน		
ลำดับ	**คำถามบทเรียน Manufacture**	**ใช่**	**ไม่ใช่**
31	ท่านมีความเข้าเรื่องปัจจัยนำเข้าการแปรสภาพและปัจจัยการส่งออก		
32	ท่านมีการตารางวางแผนการผลิตทุกเดือน		
33	ท่านมีการวิเคราะห์การตลาดเพื่อกำหนดการผลิต		
34	ท่านมีการตรวจสอบสุขภาพความสะอาดพนักงานทุกวัน		
35	ท่านเข้าใจเรื่อง GMP HACCP เป็นอย่างดี		
ลำดับ	**คำถามบทเรียน Business Plan**	**ใช่**	**ไม่ใช่**
36	ท่านเลือกทำธุรกิจโดยไม่ต้องกำหนดเป้าหมายนอกจากตลาด		
37	ท่านมีการจัดข้อมูลเอกสารพื้นฐานของธุรกิจ		
38	ท่านมีการจัดทำบันทึกข้อมูลรายละเอียดของธุรกิจ		
39	ท่านมีการวิเคราะห์คู่แข่ง		
40	ท่านมีทัศนะคติที่ดีในการทำธุรกิจ		

Appendix C

Entrepreneurial Insights Questionnaire

คำชี้แจง แบบสอบถามมี 3 ตอนโปรดทำเครื่องหมาย √ ลงใน☐หน้าข้อที่ตรงกับความคิดเห็นของท่านมากที่สุด และขอความกรุณาตอบแบบสอบถามเพื่อใช้พิจารณาสร้างบทเรียน MONARCHIST Model

ตอนที่ 1 ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม

ตอนที่ 2 ความคิดเห็นที่มีผลต่อการประกอบกิจการทางด้านผลิตอาหาร

ตอนที่ 3 ความพึงพอใจที่ประสงค์ให้มีในบทเรียนอิเล็กทรอนิกส์ MONARCHIST model

ตอนที่ 1 ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม

1. ข้อมูลทั่วไป กรุณาบันทึกข้อมูลในแบบฟอร์ม MONARCHIST model

   ชื่อ-สกุล.....อายุ.....ปี

   ที่อยู่.....(ระบุจังหวัด)

   เบอร์โทศัพท์.....E-mail.....ID Line.....

2. ที่ตั้งของกิจการ

   ☐ 1. ภาคเหนือ ☐ 2.ภาคกลาง ☐3. ภาคตะวันตก

   ☐ 4. ภาคตะวันออกเฉียงเหนือ ☐ 5 ภาคใต้ ☐6 ภาคตะวันตก

3. เพศ ☐ 1.ชาย ☐ 2.หญิง

4. ระดับการศึกษา

   ☐ 1. ต่ำกว่ามัธยมศึกษา ☐2.ระดับมัธยมศึกษา ☐3.ระดับอาชีวศึกษา ปวช/ปวส

   ☐ 4. ระดับปริญญาตรี ☐ 5.ระดับปริญญาโท ☐6. อื่นๆ

5. ประเภทธุรกิจ

   ☐ 1. ประเภทแป้ง/ ก๋วยเตี๋ยว/ขนมจีน/เส้นหมี่/บะหมี่ ☐ 2. ประเภทเนื้อ/ลูกชิ้น/ไส้กรอก/หมูยอ

   ☐ 3. ประเภทไอศครีม/ เบเกอรี่ ☐ 4. ประเภทขนมขบเคี้ยว

   ☐ 5.ประเภทเครื่องปรุง/เครื่องเทศ/ซอส

6. ขนาดของกิจการ /จำนวนพนักงาน

   ☐ 1. น้อยกว่า 5 คน ☐ 2. 5-10 คน ☐ 3. 11-20 คน ☐ 4. 21-50 คน ☐ 5. 51-100 คน

   ☐ 6. 101-200 คน

7. ความสนใจที่ประสงค์ให้มีในบทเรียนอิเล็กทรอนิกส์ MONARCHIST MODEL

   ☐ 1. บทที่ 3 การบริหารจัดการ ☐ 2. บทที่ 4 การบริหารทรัพยากรบุคคล

   ☐ 3. บทที่ 5 การบริหารการเงิน ☐ 4. บทที่ 6 การบริหารการตลาด

   ☐ 5. บทที่ 7 การบริหารวัตถุดิบ ☐ 6. บทที่ 8 การบริหารการผลิต ☐ 7.บทที่ 9 การทำแผนธุรกิจ

ตอนที่ 2 ความคิดเห็นที่มีผลต่อการประกอบกิจการทางด้านผลิตอาหาร

คำชี้แจง โปรดทำเครื่องหมาย √ ลงในช่องตรงกับความคิดเห็นของท่านมากที่สุด โดยมีหลักเกณฑ์การให้คะแนนตามระดับความคิดเห็นดังนี้

5 = เห็นด้วยอย่างยิ่ง 4 = เห็นด้วย 3 = ไม่แน่ใจ 2 = ไม่เห็นด้วย และ 1 = ไม่เห็นด้วยอย่างยิ่ง

Part 2: The opinions on the business of food production.
Please mark √ in the box closest to your comment. By the rules. Ratings based on opinion level:
5 = Strongly Agree 4 = Agree 3 = Neutral 2 = Disagree and 1 = Disagree Strongly

รายการประเมิน Curriculum	**ระดับความคิดเห็น The Opinions**				
	5	4	3	2	1
1.ส่วนของการบริหาร **1. Management**					
1.1 การประกอบกิจการมีปัญหาทางด้านการบริหารมากที่สุด 1.1 Businesses have the most administrative problems.					
1.2 ปัญหาการบริหารกิจการส่วนใหญ่เกิดจากการไม่สามารถจัดสรรเวลา 1.2 Most of the management problems are caused by not being able to allocate time					
1.3 ปัญหาการบริหารกิจการส่วนใหญ่เกิดจากการสร้างแนวทางจัดการองค์กร 1.3 Most management problems are caused by the management of the organization					
1.4 ปัญหาการบริหารกิจการส่วนใหญ่เกิดจากการแนวคิดในการพัฒนา 1.4 Most of the management problems come from the concept of development.					
2. ส่วนของการเงิน **2. Money**					
2.1 ปัญหาการบริหารการเงินส่วนใหญ่เกิดจากการหาแหล่งเงินได้ยาก 2.1 The problem of financial management is due to the difficulty in finding sources					
2.2 ปัญหาการบริหารการเงินส่วนใหญ่เกิดจากขาดบุคคลทางด้านบัญชี 2.2 Most financial management problems are caused by lack of accounting person.					
2.3 ปัญหาการบริหารการเงินส่วนใหญ่เกิดจากการขาดสภาพคล่องทางการเงิน 2.3 Most financial management problems are caused by lack of financial liquidity.					
2.4 ปัญหาการบริหารการเงินส่วนใหญ่เกิดจากการขาดเงินออม 2.4 Most financial management problems are caused by lack of savings.					
2.5 ปัญหาการบริหารการเงินส่วนใหญ่เกิดจากขาดหลักทรัพย์ค้ำประกัน 2.5 Most financial management problems are due to lack of collateral.					

รายการประเมิน Curriculum	ระดับความคิดเห็น The Opinions				
	5	4	3	2	1
3. ส่วนของการบริหารบุคคล **3. Man**					
3.1 ปัญหาการบริหารคนเกิดจากการขาดคนที่มีทักษะของงาน 3.1 Management problems are caused by lack of skilled people.					
3.2 ปัญหาการบริหารคนเกิดจากขาดเวลาในการอบรมเพิ่มทักษะให้คนงาน 3.2 Management problems caused by the lack of time to train skills.					
3.3 ปัญหาการบริหารคนเกิดจากการขาดแหล่งจัดหาคน 3.3 Management problems caused by the lack of human resources.					
3.4 ปัญหาการบริหารคนเกิดจากการขาดพนักงาน 3.4 Management problems caused by lack of staff.					
4. **ส่วนของการตลาด** **4. Marketing**					
4.1 ปัญหาการตลาดเกิดจากขาดบุคลากร 4.1 Marketing problems are due to lack of personnel.					
4.2 ปัญหาการตลาดเกิดจากขาดควบคุมการเงิน 4.2 Marketing problems are due to lack of financial control.					
4.3 ปัญหาการตลาดเกิดจากขาดทักษะในการเสนอสินค้า 4.3 Marketing problems are due to lack of skills in product offerings.					
4.4 ปัญหาการตลาดเกิดจากขาดผลิตภัณฑ์ใหม่ๆ 4.4 Marketing problems are caused by lack of new products.					
5. ส่วนของการผลิต **5. Manufacturing**					
5.1 ปัญหาการบริหารการผลิตเกิดจากอุปกรณ์เครื่องมือไม่ทันสมัย 5.1 Production management problem is caused by equipment is not modern.					
5.2 ปัญหาการบริหารการผลิตเกิดจากไม่สามารถควบคุมวัตถุดิบ 5.2 Production management problems arise from uncontrolled raw materials.					
5.3 ปัญหาการบริหารการผลิตเกิดจากไม่สามารถควบคุมต้นทุนการผลิต 5.3 Production management problems arise from uncontrollable production costs.					
5.4 ปัญหาการบริหารการผลิตเกิดจากการพัฒนาผลิตภัณฑ์ใหม่ๆได้ลำบาก 5.4 Production management problems arise from the development of new products					
6. ส่วนของวัตถุดิบ **6. Material**					
6.1 ปัญหาการบริหารวัตถุดิบเกิดจากไม่สามารถควบคุมผู้ขาย 6.1 The raw material management problem is due to the inability to control the supplier.					
6.2 ปัญหาการบริหารวัตถุดิบเกิดจากขาดเครื่องมือตรวจสอบ 6.2 Raw material management problem is due to lack of inspection tools.					
6.3 ปัญหาการบริหารวัตถุดิบเกิดจากขาดบุคลากรจัดซื้อ 6.3 Raw material management problem is due to lack of purchasing staff.					

ตอนที่ 3 ความพึงพอใจที่ประสงค์ให้มีในบทเรียนอีเล็คทรอนิกส์ MONARCHIST Model

คำชี้แจง โปรดทำเครื่องหมาย √ ลงในช่องตรงกับความคิดเห็นของท่านมากที่สุด โดยมีหลักเกณฑ์การให้คะแนนตามระดับความคิดเห็นดังนี้

5 = พึงพอใจมากที่สุด 4 = พึงพอใจมาก 3 = พึงพอใจปานกลาง 2 = พึงพอใจน้อย และ 1 = พึงพอใจน้อยที่สุด

รายการประเมิน **Curriculum**	**ระดับความพึงพอใจ** **The Satisfactions**				
	5	4	3	2	1
1. ความพึงพอใจด้านวิธีการบริหารการเงิน 1. Satisfaction on financial management methods.					
2. ความพึงพอใจด้านวิธีแก้ปัญหาทางธุรกิจ 2. Satisfaction with business solutions					
3. ความพึงพอใจด้านการแข่งขันทางการตลาด 3. Competitive Market Satisfaction					
4. ความพึงพอใจด้านวิธีการบริหารคน 4. Satisfaction on how to manage people.					
5. ความพึงพอใจด้านการบริหารวัตถุดิบ 5. Satisfaction of raw material management.					
6. ความพึงพอใจด้านการผลิต 6. Production satisfaction					
ความพึงพอใจโดยรวม Overall satisfaction					

Appendix D

The eLearning Questionnaire for In-Depth Interview to Develop Research Tools

ประเด็นนี้ใช้สำหรับในการสัมภาษณ์เชิงลึกเพื่อใช้พัฒนาเครื่องมือวิจัย

กรุณาตอบแบบสอบถามจากรูปแบบ eLearning สำหรับการพัฒนาโครงสร้างและเนื้อหาของแบบจำลองด้านการจัดการการจัดการเทคโนโลยีสารสนเทศและมัลติมีเดียที่มีเนื้อหาครอบคลุมทุกด้านของแบบจำลอง MONARCHIST ได้แก่ การจัดการธุรกิจการเรียนรู้ ออนไลน์และการศึกษาผ่านเว็บ พร้อมข้อเสนอแนะ

This topic is used for in-depth interviews to develop research tools.

Please answer the eLearning questionnaire for the development of the structure and content of the management model for managing information technology and multimedia content covering all aspects of the MONARCHIST model: business management, online learning, and web-based education. With feedback (Counsel)

Item	รายการ Particular
1)	ภาพรวมของบทเรียน: บทเรียนมีการแนะนำอย่างชัดเจนลดความสับสนและมีจุดประสงค์ที่ชัดเจนหรือไม่? Overview of the lessons: Do the lessons have a clear introduction, relieve confusion, and have a clear purpose?
คำตอบ: Answer:	
ข้อเสนอแนะ: Counsel:	
2)	บทเรียน: สอดคล้องกับวัตถุประสงค์ของการเรียนรู้หรือไม่? ความสัมพันธ์ระหว่างพวกเขาอย่างต่อเนื่องหรือไม่? ลำดับการเรียนรู้มีความสมบูรณ์และเหมาะสมหรือไม่? พวกเขาใช้ภาษาที่ถูกต้องและชัดเจนหรือไม่? Lessons: Are they consistent with the purpose of learning? Is the relationship between them continuous? Is the sequence of learning complete and appropriate? Do they use correct and clear language?
คำตอบ: Answer:	
ข้อเสนอแนะ: Counsel:	

Item	รายการ Particular
3)	ระบบการสอน: การออกแบบระบบเป็นระบบที่ผู้เรียนมีโอกาสในการควบคุมลำดับการเรียนรู้และกลับไปใช้อย่างเหมาะสมหรือไม่? The system of teaching: Does the systematic design give the learner the opportunity to control the learning sequence and return to it appropriately?
คำตอบ: Answer:	
ข้อเสนอแนะ: Counsel:	
4)	กราฟิกและการออกแบบ: ทำวิทยานิพนธ์เพื่อช่วยสื่อสารกับผู้ใช้อย่างถูกต้องและน่าสนใจด้วยภาพประกอบที่ชัดเจนซึ่งถ่ายทอดความหมายและเนื้อหา? Graphics and design: Do theses help to communicate with the user properly and in an interesting way with clear illustrations that convey meaning and content?
คำตอบ: Answer:	
ข้อเสนอแนะ: Counsel:	
5)	เทคนิค: โมเดล Monarchist สามารถใช้กับคอมพิวเตอร์เครื่องใดก็ได้ที่มีคุณสมบัติขั้นต่ำตามที่นักพัฒนาซอฟต์แวร์ต้องการ โดยไม่มีปัญหาในการแสดงภาพและเสียงหรือไม่? Technical: Can the Monarchist model be applied to any computer with minimal qualifications required by the developer without the problems of visual and audio rendering?
คำตอบ: Answer:	
ข้อเสนอแนะ: Counsel:	

Appendix E

BIO-DATA

Name of Researcher: Mr. Patarakit Phisarnchananan

Educational Background:

1. BA (Political Science), Ramkhamhaeng University, Bangkok, Thailand (2000)
2. MA (Public Administration), Chulalongkorn University (2007)

Work Experience:

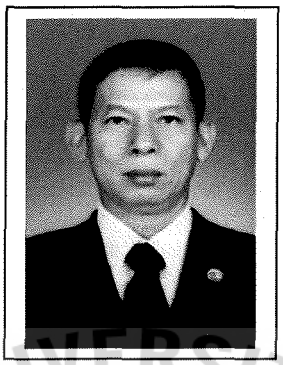
1. Founder of Patarakit Chemical Co., Ltd. (Manufacturer and Distributor of Food Chemical) (1983-Present)
2. Executive Chairman, Patarakit Chemical Group (PC Group) (1983-Present)
3. Specialist in the Field of Food Production. (1983-Present)

Social Experience:

1. President of Rotary Club of Wattana (2008)
2. Advisors to Parliament's Fraud Prevention Commission (2009)
3. Advisor to the Minister of Culture (2010)

BIO-DATA

Doctor of Philosophy: eLearning Methodology



Dr. Patarakit Phisarnchananan

Dissertation Title:

DEVELOPMENT OF AN eLEARNING MODEL IN SMALL AND MEDIUM ENTERPRISES MANAGEMENT SKILLS FOR THE THAI FOOD INDUSTRY

Advisor

Assoc. Prof. Dr. Chitapa Ketavan (Advisor)

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Education

- B.A. (Political Science), Ramkhamhaeng University, Thailand, 2004
- M.A. (Public Administration), Chulalongkorn University, Thailand, 2007
- Ph.D. (eLearning Methodology), Assumption University, Thailand, 2018

Employment

- Present: President of PC GROUP
- 2015 - Present:Managing Director of Big Tree (15) Co.,Ltd, Thailand
- 2008 - Present: Managing Director of PCK Associate Co.,Ltd, Thailand
- 1986 - Present: Managing Director of Kyuta Chemical (Thailand) Co.,Ltd, Thailand
- 1984 - Present: Managing Director of Patarakit Chemical Co.,Ltd, Thailand