DEVELOPMENT OF AN ELEARNING MODEL IN SMEs MANAGEMENT SKILLS FOR THAI FOOD CLUSTERS

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Abstract: *The main objective of the study was to develop a web-based learning model in Small and Medium Enterprises (SMEs) management skills for Thai Food Clusters called MONARCHIST model. The model was conducted based on the needs of learners and experts' recommendations by using Learning Management System (LMS) to facilitate an online course. The efficiency of the eLearning model developed was analyzed as well as the satisfaction of the Thai Food Industrial entrepreneurs towards the LMS. This study assesses the utility of mixed methods designs that integrate qualitative (In-Depth Interviews) and quantitative (Sample Survey) approaches. The data were collected from the entrepreneurs, who were working in five sectors of food production areas. This study used descriptive statistics, paired t-test, and correlation to measure the importance of satisfaction components. Research findings were that the MONARCHIST model met the 80/80 efficiency criterion. Additionally, participants showed significant improvement in their knowledge in business management after course completion (p<0.01). Furthermore, the satisfactory score of learners towards the MONARCHIST model was high (4.38 out of 5.00). These results conclude that the MONARCHIST model was effective and practical for implementation.*

Keywords: *Web-based learning model, Small and Medium Enterprises, Thai Food Cluster, Management Skills.*

INTRODUCTION

Small and Medium Enterprises (SMEs) have had a significant impact on industrial sectors in Thailand since the late 1990s, both entrepreneurially and financially. A report conducted by the Office of Small and Medium sized Enterprise Promotion or OSMEP showed that SMEs constituted almost 40 per cent of GDP by value (OSMEP, 2017). As proposed by the Ministry of Industry, Thailand in 2002, the definition of SMEs in Thailand was classified into 4 sectors, namely Manufacturing, Service, Wholesale and Retail sector, by using both the number of employees and the value of total fixed assets (excluding land) as the main consideration (OECD, 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 and Scholtès, 2002). More than 90 percent of the total firms are SMEs. Within the manufacturing sector, the Thai Food Industry was the largest industry which was the main target group to be promoted by the Government (Thailand Investment Review, 2017).

However, Thai entrepreneurs are still confronted with the problems of material price, wages, transportation, and energy costs as well as the pressure from high potential competitors like China and Vietnam. Therefore, Thai entrepreneurs are required to improve their quality and standards to achieve world recognition along with the attempt to export to the new markets in order to avoid the price war.

Due to the financial crisis in Thailand, in 1997 and 2008, these events have caused the country to lose a lot.

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Thailand SMEs were very volatile as large fluctuations can be adduced by several factors, including lack of knowledge and ability to manage technology marketing, lack of systematic and professional business management, lack of product design, R & D and packaging development, lack of good corporate governance, energy and environmental conservation (Shengtao, 2016). In addition, most Thai food SMEs use outdated technology, and shortages of skilled workers is also another main issue faced by SMEs in the food industry, They do not consider innovation and technology management to be a priority. Most of them follow traditional practices by simply copying foreign products sometimes with minor changes, and neglecting consumer needs (Saigosoom, 2013). This leads to barriers to growth, not only in terms of creativity, but also innovation opportunities.

Besides, according to data from The Office of Small and Medium-sized Enterprise Promotion in 2005, more than 80% of economic growth took place due to medium-sized and small enterprises that had emerged in many parts of Thailand. Regarding the situation of SMEs in 2009, it was found that the factors that affect business operations in negative ways were identified into 5 items as; 1) the Thai economy, 2) particularly with respect to investment, confidence, and export capability, 3) the government political issues of SMEs, 4) the domestic consumer behavior and 5) the domestic competition as a big and multi-national enterprises may have more market share, causing SMEs to perform poorly in the market (Nimman, 2009; Sakolnakorn, 2010).

In an era where everything can be changed from manual inputs to the most advanced technology to enhance learning rapidly, employers and employees are deemed to take 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 certain knowledge necessary to further hone their skills in their related fields, especially in management, eLearning has become a powerful tool in business industries. The emerging use of technology not only in technical industries but in all business ventures has revolutionized our ways 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.

ELearning has also played an important role in closing the gap between continuing education and time management, with its accessibility and flexibility in terms of use and schedule. 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, hence a study of its real effects and benefits has been called for.

Based on the aforementioned factors, which are all considered barriers to the development of new innovations for SMEs, and which consequently result in inefficiency regarding innovation management, it seems that knowledge in management skill for SME entrepreneurs is considered as the major tool for SMEs. The MONARCHIST model was then developed with the aim of increasing SMEs knowledge in management in order to be successful in their business and to increase the quality of their product as well.

OBJECTIVES

1) To study the management skill of Thai Food Industrial entrepreneurs in Thailand;

2) To develop an eLearning model in SMEs Management Skills for Thai Food Clusters;

3) To study the effectiveness of the eLearning model developed;

4) To study the satisfactions of the Thai Food Industrial entrepreneurs towards the utilization of eLearning model developed.

RESEARCH METHODOLOGY
Research Design

The research was conducted as a control quantitative research study in which data were collected before and after the intervention. The same sample participants were used for the pre-post intervention. The intervention was the eLearning courses
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online, which consisted of management skill lessons of Thai food cluster SMEs.

Figure 1 shows the elements of research design, which involved the research approach, sample size, sampling technique, research instruments, method of data collection and analysis to answer specific research questions
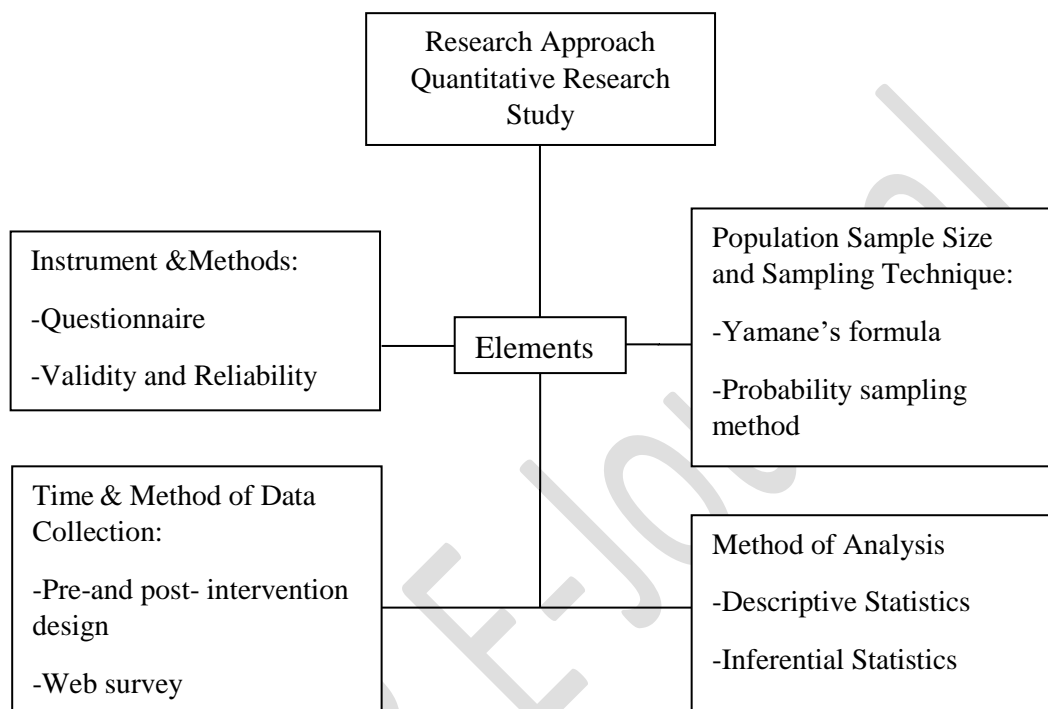

Figure 1: The Elements of Research Design

Research Instruments Development

The research instruments used for this study were questionnaire and an eLearning model. The questionnaire comprised two main structures as follows:

1) The measure opinion of the lessons consisted of Part of the lesson, Lesson, Design, Graphic components, the Interaction Design and the Technical aspects of the Internet.

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

A Five-point Likert scale was used to measure and evaluate learners' opinion about an
 eLearning model. The interpretation of the results follows this guide, based on an interval scale of the average score: 1–1.8 low, 1.81–2.6 rather low, 2.61–3.4

moderate, 3.41–4.2 rather high and 4.21–5.0 high.

The eLearning model consisted of the nine chapters, which include learning content, practice, and exam test. To determine the content validity of instruments, 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 IOC calculation, the IOC scores from the experts were equaled 1.00 in all items, following standard practice.

In addition, reliability test of the questionnaire was performed to measure the internal consistency of an instrument using Cronbach's alpha (Bland and Altman, 1997). The Cronbach's alpha value

obtained for both structures of questionnaire as shown in Table 1 were higher than 0.7 which indicates a high degree of internal consistency. The questionnaire used for collecting data from respondents in this research was reliable.

Table 1: Reliability measure of the items in each structure

Structures	No. of items	Cronbach's alpha
The measure opinion of the lessons	20	0.871
The satisfaction evaluation of the eLearning model	14	0.862

Population and sample

The questionnaires to collect the data were conducted at different levels of business executives working in the area of food production sector across the country. According to the Department of Industrial Works, the total size of this population is 1,274 members.

The sample size of this study was calculated based on Yamane's formula (Yamane, 1967).

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

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

$$= \frac{1,274}{4.185} \approx 305$$

where, n = sample size

N = size of population

e = tolerable error (5%)

Therefore, the minimum sample size for this study was equal to 305 enterprises. The Stratified Systematic Sampling was used for sample selection. The procedure was as follows.

Step1: Classified enterprises into 5 business sectors, i.e. starchy foods, meat, ice cream & bakery, snack foods and sauces & condiments.

Step2: Take a systematic sampling within each stratum.

Step3: Collected questionnaires from one entrepreneur for each enterprise.

As presented in Table 2, the sample allocated to each stratum was proportionally to the number of units in the frame for the stratum.

Table 2: Number selected for a proportional stratified random sample

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

Source: Department of Industrial Works (2015)

Development of eLearning "MONARCHIST" Model

The development of an eLearning model for Thai Food Industrial entrepreneurs in Thailand was performed according to the following steps:

Step1: Studying the needs of business owners to manage their business by using an in-depth interview. Some key factors affecting the Thai Food Industrial entrepreneurs were listed to develop the model.

Step2: Developing Model: The MONARCHIST model was designed according to the capital letters of words related to business management (M=Man, O=Obligation and Orientation, N=Network and Need, A=Apply, R=Relation and Recruit, C=Control, H=How, I=Investigate, S=Satisfied and T=Training and Treats). The researcher arranged the content which was related behaviors of business management, selected a Learning Management System (LMS), and prepared resources which included the practice and exam test for learners to evaluate learner's knowledge and achievement. The content validity was checked through the use of three experts who frequently used the computer and internet.

Step3: After interviewing the experts, the MONARCHIST model was developed. This model comprised nine lessons, practice and exam test of each lesson. However, before it was fully implemented, the efficiency of the MONARCHIST model was tested according to the 80/80 criteria (E1/E2) (Brahmawong, 2013).

Implementation and Data Collection

The 9 lessons of the MONARCHIST model in SMEs management skill for Thai food Clusters were designed using web-based tools. Each lesson was designed for about an hour to complete the lesson, the pre-test of each lesson to be completed within 5 minutes before studying, the user's satisfactions to be completed within 15 minutes and the post-test after completing all lessons within 40 minutes. The implementation consisted of the following steps:

Step1: Invite 305 participants to join the MONARCHIST model.

Step2: The learners registered for username, password and individual code by themselves within a day.

Step3: After closing and registration, the learners completed the online pre-test within 7 days.

Step4: The learner learned SMEs lesson and completed the practice test of each lesson before learning the next lesson.

Step5: The learners completed 9 lessons within a month.

Step6: The learners completed the post-test within a day.

Step7: The learners completed the satisfaction survey about the use of the MONARCHIST model eLearning program.

Results from the test as well as data obtained from questionnaires were collected for further analysis.

Data Analysis

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

Descriptive statistics include: frequency, percentage, mean, and standard deviation which were used to describe the basic features of the data in this study, i.e. participant profile, participants' opinions or satisfaction.

Paired *t*-test was used to compare learner's scores before and after learning. In addition, Pearson's correlation measured the importance of satisfaction components (i.e. lesson components, lesson content, teaching system, graphic and design, interaction design, and the technical aspects of internet) on overall satisfaction.

RESULTS AND DISCUSSION
Needs Assessment Interview

From in-depth interview of 30 participants in SMEs food industrial entrepreneurs, the problems which affected SMEs management were identified from highest number to the lowest as follows:

1) Money: lack of cash flow and inaccessibility to finance sources, lack of securities to guarantee the financial loan that there was no clarity to show their revenue, and lack of accounting system to the source of revenue.

2) Human Resources: lack of loyalty to the organization, lack of work skills, and lack of responsibility in their work.

3) Management: lack of management system, especially with regards to the most of SMEs which were the family management system that do not have access to new learning resources.

4) Manufacture: lack of effective supervisors who had ability to control labor to follow good manufacturing processes.

5) Materials: lack of a knowledgeable purchaser, and lack of ability to control suppliers of raw materials.

6) Marketing: lack of marketing expansion, lack of marketers who are willing to devote to the organization and lack of ability to track record of repaying a debt from impaired customers.

Based on the aforementioned factors, learners' needs were to make accurate financial management for small businesses information management to access funding sources. Personnel management for the strength of the business, the knowledge management including sales, purchasing, and production management were required to make the new ways to run a business that needs growth.

The MONARCHIST model

An eLearning program of MONARCHIST model was designed into 9 lessons according to the needs of learners and experts' recommendations as follows:

Lesson 1: Introduction to SMEs and MONARCHIST model
- SME Classification
- Importance of SME to economy
- Issues and limitations of SMEs in general
- SMEs situation in Thailand
- New Steps to entrepreneurship SMEs in Thailand

Lesson 2: MONARCHIST model
- Management
- Man
- Money
- Marketing
- Material
- Manufacturing

Lesson 3: Management
- Management of the business based on the MONARCHIST model

Lesson 4: Man
- Human resource management based on MONARCHIST model

Lesson 5: Money
- MONARCHIST model of money Management

Lesson 6: Marketing
- Marketing management based on MONARCHIST model

Lesson 7: Material
- Material management based on MONARCHIST model

Lesson 8: Manufacturing
- Manufacturing(Production) management based on MONARCHIST model

Lesson 9: Business plan
- Choosing a good business
- Data gathering

- Market analysis and business analysis
- Defining business model
- Start Business plan

The components of the module in each lesson were divided into learning content, practice and exam.

The sample of MONARCHIST model eLearning program is shown in Figure 2 and 3.
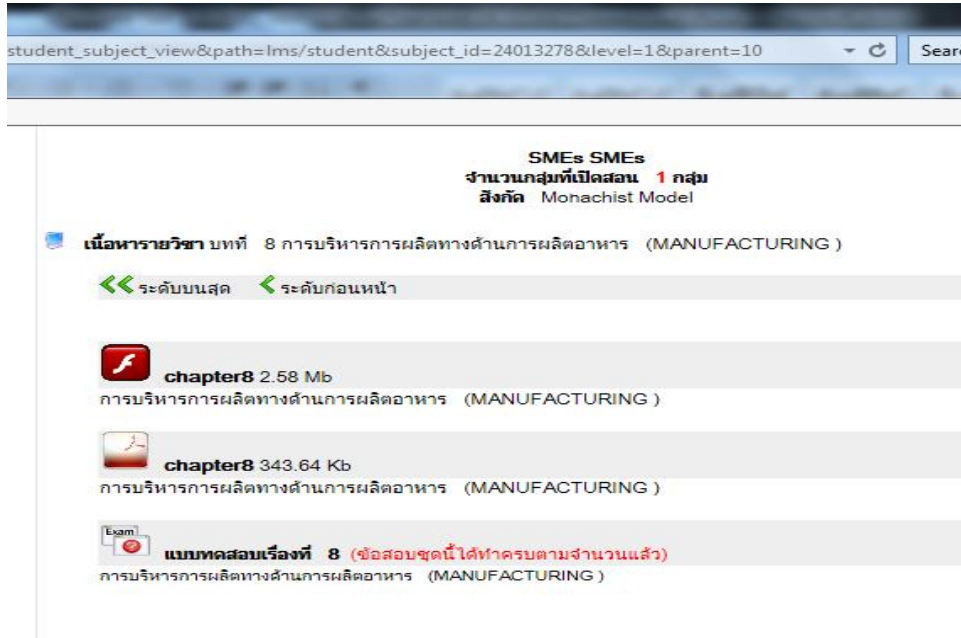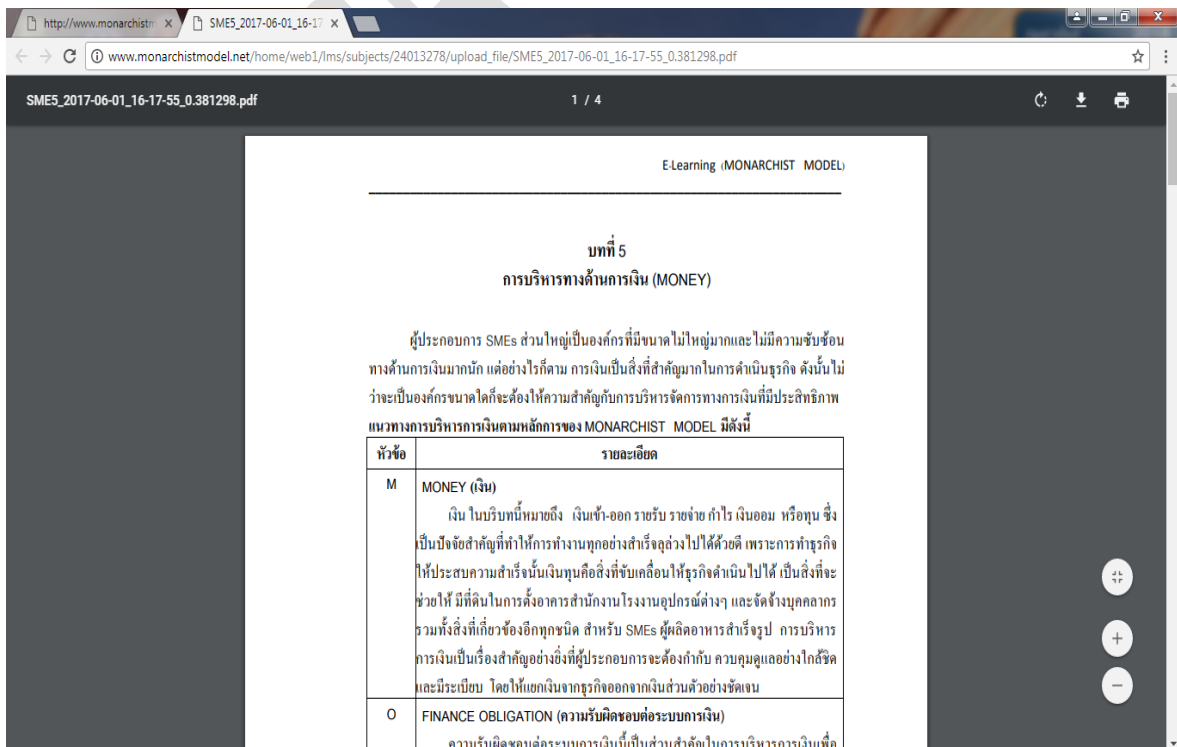

Figure 2: MONARCHIST model eLearning progra

Figure 3: Content of MONARCHIST model

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. There were three trials to evaluate the lesson, i.e. individual, small group, and field trials. The results of each trial are shown in Table 3.

Table 3: 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 test were below the standardized criteria of 80/80. This indicated that the instructional package was not appropriate to participants' learning abilities. According to the feedback given by participants, it was found that learners required some rearrangement of the content categories for each lessons in order for them to have a better understanding. Then, the lessons were revised. Consequently, the efficiency of the process and product in the small group improved but did not yet meet the standard criterion 80/80. 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 efficient.

Demographic Profile of participants

The demographic information of 305 participants were collected and analyzed as showed in Table 4. The majority of samples were male (56.8%), while the rest were female (43.2%). 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 undergrad secondary school (11.7%). About one-third of respondents had ice cream & bakery business (37.0%) followed by meat (20.7%), starchy foods (18.7%), sauces & 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%).

Table 4: Demographic profile of 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 & Bakery	113	37.0
	Snack foods	28	9.2
	Sauces &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

Knowledge and Skill Improvement

Pre-test and Post-test were designed to measure entrepreneurs' improvement in knowledge and/or skill over the course. From a total of possible 40 points, the overall mean pre-test score was 18.86 points, compared with the mean post-test score of 31.21 points. This difference between the pre-test and post-test mean equals 12.35 points. In addition, a paired samples t-test was applied to overall of the course statistical analysis. The results showed that the learners' Post-Learning achievement mean scores (Post-test) were significantly higher than their Pre-Learning (Pre-test) counterpart achievement at the 0.01 level (Table 5).

Table 5: Paired Samples *t*-test Comparing Pre-test and Post-test Scores

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<0.01

Learners' Satisfaction with Web-based Training Experiences

A major purpose of this study was to explore the association between the overall learners' satisfaction and aspects of satisfaction (i.e. lesson component, lesson content, system of teaching, graphics and design, interaction design, and internet technical support). The conceptual, linkage, and research models presented the

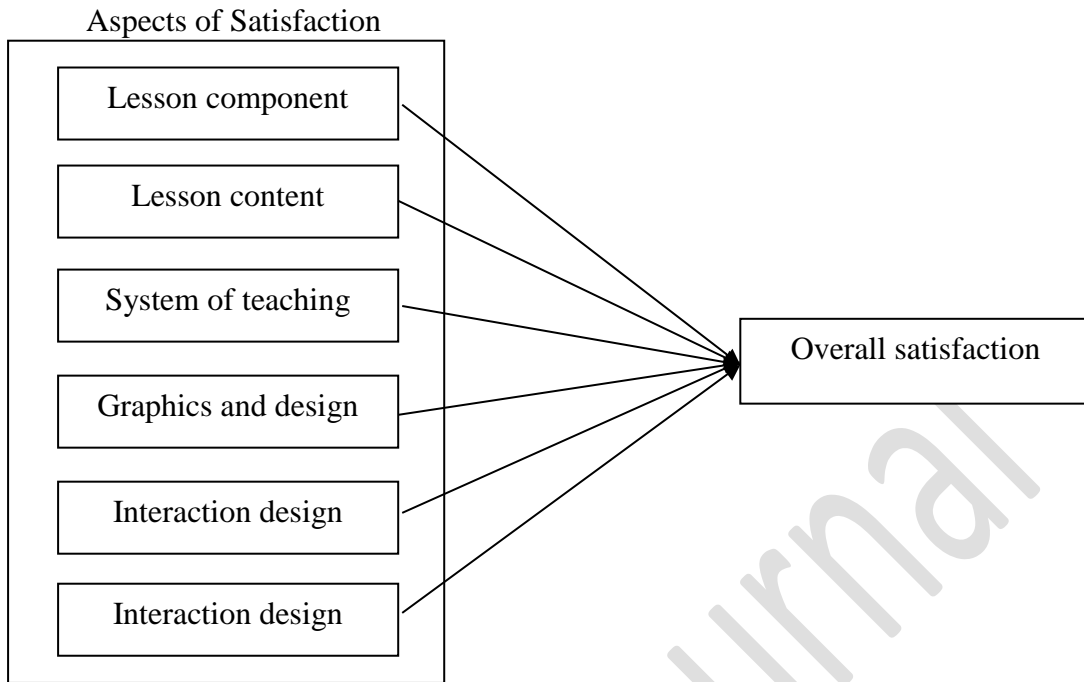relationship between variables as shown in
Figure 4.

Aspects of Satisfaction

Figure 4: Relationship model between variables

According to Table 6, the overall learners' satisfaction score towards 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 aspects of satisfaction. The results showed that all six specified aspects were significantly related to the overall satisfaction. Lesson content (r = 0.854), system of teaching (r = 0.853), graphics and design (r = 0.842), lesson component (r = 0.829), and internet technical support (r = 0.733) displayed especially high levels of importance, while interaction design had moderate level of importance on overall satisfaction.

Table 6: Mean, SD and Correlation between Variables

Variables	Mean	SD	Pearson's Correlation						
			1	2	3	4	5	6	7
1. Lesson components	4.37	0.487	1						
2. Lesson content	4.34	0.499	0.636*	1					
3. System of teaching	4.34	0.509	0.615*	0.624*	1				
4. Graphics and design	4.42	0.518	0.652*	0.636*	0.646*	1			
5. Interaction design	4.58	0.611	0.355*	0.375*	0.428*	0.239*	1		
6. Internet technical support	4.38	0.617	0.505*	0.514*	0.640*	0.564*	0.327*	1	
7. Overall satisfaction	4.38	0.421	0.829*	0.854*	0.853*	0.842*	0.476*	0.733*	1

* Correlation is significant at the 0.01 level (2-tailed).

CONCLUSION

In this study, the MONARCHIST eLearning model in SMEs Management Skills for Thai Food Clusters was developed based on the experts' comments and learners' needs survey results. The researcher mainly studied the efficiency of the eLearning model developed and the satisfactions of the Thai Food Industrial entrepreneurs towards the utilization of eLearning model developed. Results from the study revealed that the model met the efficiency criterion 80/80 and the learners who studied business management through the LMS showed significant improved outcomes. Additionally, the overall learners' satisfaction scores towards the eLearning model was high. It can be clearly observed that the learners' satisfaction was directly related to perceived lesson content as well as the system of teaching, graphics and design, lesson components, and internet technical support. On the basis of a large amount of evidence, it can be concluded that the web-based learning model was effective and appropriate for implementation.

Since the target population participated in this research was limited only the area of food production sector. Therefore, for future research, more studies should be conducted in wider community of food manufacturing sectors, such as dried beans and fruit, pickled vegetables, etc., to get more comprehensive data. Moreover, the other social media platforms such as Facebook, Line, Youtube, etc. could be used instead and research could be conducted to compare the results of these platforms to web-based learning model for creating an LMS based on this research topic.

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