

An Integrated Supply Chain Model for Educational Management for Higher Education Institutions in Thailand

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Abstract— The research aim is develop and to evaluate of an integrated supply chain model for educational management for higher education institutions in Thailand. The sample group of 10 expert consisted of three experts on supply chain , two expert on curriculum, three expert on Educational Research and Evaluation and two expert on management, The expert selected by purposive sampling. All experts must have educational qualification at the doctoral degree level, and must have more than two years of work experience The statistical methods used in the research are arithmetic mean and standard deviation. The research findings show that integrated supply chain model for educational management for higher education Institutions in Thailand comprises six principal, namely, main components Suppliers, service provider, customer, finished product and consumer. The overall evaluation result an integrated supply chain model for educational management for higher education institute in Thailand shows the overall arithmetic mean of 3.60 and standard deviation of 0.64. Suggesting that an integrated supply chain model for educational management for higher education Institutions in Thailand to be appropriately applied in actual work settings.

Keywords— An integrated supply chain ,E ducational management, Higher education Institutions in Thailand

1. Introduction

Nowadays, Education system have significant, the Thai government has realized the importance of adjusting the country to increase its capability to compete with other countries in every aspect. Especially the management of education, research, and the organization of university projects are important. Various University have increased their competitive ability by developing education, research and the organization of university projects to create quality products in agriculture and industry. One of their strategies is the application of an integrated supply chain management system. Integrated supply chain allows agency to focus on

assets that would allow the organization to reap more rewards,[1] The researcher has realized the importance of integrated supply chain development in order to cope with economic, social and political changes. In the business and industrial sector the changes have included the movement toward more and more application of the concept of integrated supply chain management system. This is because the business and industrial sector needs to be highly competitive due to increasingly high competitions from both within and outside the country. In order to be highly competitive, organizations in the sector need to have personnel with knowledge, ability and skills who can work efficiently to increase output and products. The organizations, therefore, need to have sufficient data and resources to increase their values and respond to the demand of their clients. Thus, an integrated supply chain management process is a key process to support the organization's whole activities system from upstream to downstream. It enables the organization to promptly check the information system to ensure that the organization operates smoothly and effectively based on the determined strategies. [2].Based on this realization, the researcher has decided to develop an integrated supply chain model for educational management for higher education institutions in Thailand for increase satisfaction of consumers.

2 Research Methodology

2.1 Conceptual framework

The conceptual framework, as shown in figure 1.

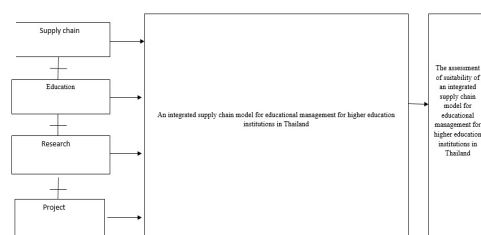


Figure 1 : The conceptual framework about an integrated supply chain model for educational management for higher education institutions in Thailand

2.2 Research Literature

The Education is being part of the service industry from the manufacturing industry as its product, i.e. knowledge, is intangible Effective education relies much on its personnel's knowledge, experience, and ethics. Supply chains are quite easy to define for manufacturing organizations, where each participant in the chain receives inputs from a set of suppliers, processes those inputs, and delivers them to a distinct set of customers. With educational institutions, one of the primary suppliers of process inputs is customers themselves, who provide their bodies, minds, belongings, or information as inputs to the service processes. We refer to this concept of customers being suppliers as "customer-supplier duality." The duality implies that educational supply chains are bi-directional, which is that production flows in both directions.[11]

In educational supply chain, a university works in close collaboration with schools, further education colleges, its current students, university staff, and employers of its graduates in designing curricula [10] to ensure that the needs of all stakeholders are satisfied. It may also apply total quality management to enhance the carried out, and they have to be backed up by quality supporting services.

The paper attempts to develop a model for successful educational supply chain management. The research focuses on the universities. The researcher investigates numerous literatures on supply chain management to shed lights on educational supply chain components and how they may be operated and coordinated to achieve the goals. The desirable goals may be quality graduates and research outcomes. The ultimate goal of a successful educational supply chain is, however, the improved well-being of the society. The main objective of this research is to attain favorable supply chain performance by developing an integrated educational supply chain management model for the universities. The researcher attempts to fulfill the following objectives:

- To depict a holistic view, comprising inputs, the process, and outputs of the educational supply chain
- To develop a model of integrated educational Supply chain management The proposed model addresses integrated educational supply chain management in three levels, including strategic, planning and operating levels. At each level, proper strategies, plans, and operations are developed and assessed for both education and research activities

Habib (2008) writes the article about Integrated Educational Supply Chain Management (IESCM) for the Universities provides two main contributions to the society, including human resource contribution and research contribution.

This empirical study depicts a holistic view, comprising inputs, the process, and outputs of the educational supply chain. Educational management represents the process component, which may be accomplished in three levels, including strategic, planning and operating levels. The two innovative ideas, which are education and research, for managing IESCM in the universities are explored. The research provides educational management a new dimension to understand how supply chain management contributes to successful university operations.[10]

Habib.& jangthirapanich (2010) writes the article about an empirical study of educational supply chain management for the universities found that The exploratory study addresses education supply chain and research supply chain as major constituents in the educational supply chain management model for the universities. model constructs were identified and confirmed by 493 respondents, representing university administrators, faculty and staffs, employers, and graduates. The resulting model was subsequently evaluated for accuracy and validity by multiple linear regression (MLR) analysis and the structural equation modeling (SEM) technique. The research model furnishes stakeholders of the supply chain with appropriate strategies to review and appraise their performance toward fulfillment of ultimate goals, i.e. producing high-caliber graduates and high-impact research outcomes for the betterment of the society.[9]

2.3 The principle of three decision levels in supply chain management for the universities

1. Strategic Level: Strategic level decisions are the highest level. Here a decision concerns general direction, long-term goals, philosophies and values. These decisions are the least structured and most imaginative; they are the most risky and of the most uncertain outcome, partly because they reach so far into the future and partly because they are of such importance.

2. Planning Level: Planning level decisions support strategic decisions. They tend to be medium range, medium significance, with moderate consequences.

3. Operating Level: Operating level decisions are every day decisions, used to support planning level decisions. They are often made with little thought and are structured. Their impact is immediate, short term, short range, and usually low cost. The consequences of a bad operational decision will be minimal, although a series of bad or sloppy operational decisions can cause harm. Operational decisions can be pre-programmed, pre-made, or set out clearly in policy manuals.[5]

To accomplish proper teaching and research works in the universities; different factors have to need analyzed. Four factors, as following [6]

1 Programs Establishments (PE): Programs establishment would be occurred for the education and research in terms of development and assessment in the universities. Universities design different programs, to enhance the diversification in education development and establish various programs to assess the development. Universities also intend different programs to increase the diversification in research development and research assessment. Universities have to attempt product differentiation, i.e. programs establishment. With the growing number of establishments attaining university status, this issue should be appearing on each program director's agenda. Hands-on experience, industrial placements, social demand, provision of IT facilities, and innovative academic methods all demonstrate attempts to differentiate programs establishment .[10]

2 Faculty Capabilities (FC): Faculty members establish good communication, provide rich environment for classroom observation, model best practices, create opportunities for reflection, and support students' participation in curriculum planning, teaching and research. Traditionally, university faculty members are evaluated according to the three major criteria: teaching, research, and services.[5]

3 University Culture (UC): The concept of organizational culture would be applicable for the universities by the name of University Culture. However, the type of the university culture will fully depends on the university management or administrator. In fact, university culture is the personality of the university .[6]

4 Facilities (FA): Universities offer a wide range of modern facilities to their students. These include state of the art lecture halls, libraries, laboratories and IT services to ensure that students are provided with an environment in which they can learn, both successfully and comfortably. Lecture rooms are principally conducted using state-of-the-art distance learning technology, online education, e-learning via Internet. Online databases, e-journal, digital library, etc. represents modern research facilities in the universities [6]

From the point of view of supply chain management, Integrated Educational Supply Chain Management (IESCM) model for the Universities by the empirical research. The widespread implementation of supply chain management induced manufacturing and service industries to move beyond national borders is enticed by the global competition in business and service. Applying supply chain management in service industries like educational institutions generally considered it successful in managing their supply chains. The exploratory study addresses education supply chain and research supply chain as major constituents in the integrated educational supply chain management for the universities. Educational

supply chain management consists of supplied input to the university and supplied output of the university. The authors identified different factors that have been formularized by the Structural equation modeling through AMOS. The survey questionnaire was developed and analyzed the reliability and validity of the tools. The findings of the research show the significant relationship among different factors of the educational supply chain management. From the global perspectives, the conceptual model for the universities provides a novel approach for decision makers of each supply chain components to review and appraise their performance toward fulfillment of ultimate goals, i.e. producing high-caliber graduates and high-impact research outcomes for the betterment of the society. The research model provides two contributions to the end customer, i.e. the society including human resource contribution and research contribution.[9]

The main goals of an educational supply chain is to improve the well-being of the end customer or the society. To achieve this goal, educational institutions need to have a certain degree of knowledge about the partners in their supply chains including suppliers, customers, and the consumer. The performance of the supply chain management depends on the seamless coordination of all supply chain stakeholders to ensure attainment of desirable outcomes.[7]

3 Research hypothesis

An integrated supply chain model for educational management for higher education institutions in Thailand is evaluated to be appropriate at the high level.

4. Research instruments

1 An integrated supply chain model for educational management for higher education institutions in Thailand.

2. A questionnaire to assess the expert's opinions toward an integrated supply chain model for educational management for higher education institutions in Thailand.

4. Research methodology

The research methodology is divided into 2 step which are:

1. Development of an integrated supply chain model for educational management for higher education institutions in Thailand, being synthesis of element of an integrated supply chain model for educational management for higher education institutions in Thailand which are suppliers, service provider, customer ,finished product and consumer.

2. Evaluating of an integrated supply chain model for educational management for higher education institutions in Thailand, being present an integrated supply chain model for educational management for higher education institutions in Thailand by ten experts and analyse the results of evaluation of an integrated supply chain model for educational

management for higher education institutions in Thailand using means (\bar{X}) and standard deviation (S.D.) following the weighing criteria of using five rating scales of Likert. as follows:[2]

- The rating of 5 means most appropriate.
- The rating of 4 means highly appropriate.
- The rating of 3 means moderately appropriate.
- The rating of 2 means lowly appropriate.
- The rating of 1 means least appropriate.

3 Data collection and analysis. The developed questionnaire was sent to the experts in order to ask their opinions on appropriateness of developed an integrated supply chain model for educational management for higher education institutions in Thailand from the experts were analyzed to find the mean and standard deviation of each component. Criteria for interpretation of the means are as follows:

- The rating means ranging from 4.51 – 5.00 means appropriate at the highest level.
- The rating means ranging from 3.51 – 4.50 means appropriate at the high level.
- The rating means ranging from 2.51 – 3.50 means appropriate at the moderate level.
- The rating means ranging from 1.51 – 2.50 means appropriate at the low level.
- The rating means ranging from 0.00 – 1.50 means appropriate at the lowest level.

4 Final improvement of an integrated supply chain model for educational management for higher education institutions in Thailand based on suggestions from the experts.

3 Research Findings

3.1 Research findings about an integrated supply chain model for educational management for higher education institutions in Thailand are presented in Figure 2, as shown below:

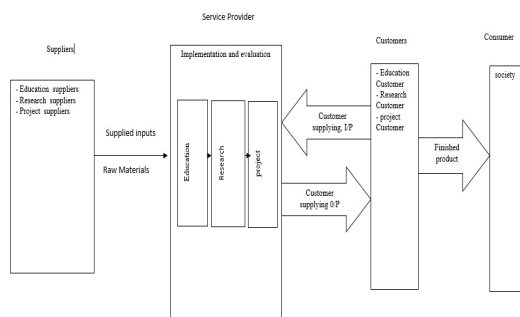


Figure 2: An integrated supply chain model for educational management for higher education institutions in Thailand

3.2 Principles of an integrated supply chain model for educational management for higher education institutions in Thailand

1 Suppliers
The suppliers are two major wings in suppliers for the universities - education suppliers, research suppliers as following

- 1.1 Education suppliers or Project suppliers :
 - 1 Suppliers of the student (High School/College)
 - 2 Suppliers of the faculty (Other Universities)
 - 3 Self funding students
 - 4 Source of Fund – Family (Parents, Siblings, Relatives, etc.)
 - 5 Government and Private Organizations (Scholarship)
 - 6 Suppliers of Assets or Equipment (Furniture, Computer, Networking Equipment, etc.)
 - 7 Suppliers of Educational Materials (Stationery, Instruction Materials, etc.)

- 1.2 Research Suppliers:
 - 1 Suppliers of Internal Research Projects (University Self Funding)
 - 2 External Research Projects (External Research Funds, Ministry of Education, Private Organizations, etc.)
- 2 Service provider

A service provider mean university. There are two major factors including development and assessment for both education and research in the university. Through proper educational management, the university can produce quality outcomes for the society. The university have three decision levels for both education, research and project in the university. Each level consists of two parts, namely development and assessment in education and research including project. Development and assessment should be occurred concurrently for both education and research including project. Assessment at different levels assures stakeholders' satisfaction in integrated supply chain.

3 Customers
The customer are two major wings in customers for the universities: Education customers and research customers as following

- 3.1 Education Customers:
 - 1 Graduates with desirable quality
 - 2 Family (Parents, Siblings, Relatives, etc.)
 - 3 Employers of government and private organizations

- 3.2 Research Customers:
 - 1 Funding organizations of research projects
 - 2 Quality research outcomes (Researchers, Research Publications, Findings etc.)
 - 3 Others (Research Professional Organizations - IEEE, INFORMS, ACM, Society of Manufacturing Engineers etc. and Trade Associations - American Trade Association, Grocery Manufacturers Association etc.)

All customers of the universities are recognized

as consuming output customers. Some of the graduates would be added in the service provider as the supplied input. On the other hand, some graduates would be acted as the supplied output to the end customer. Therefore, the result identified graduates with desirable quality as the supplying input customer in integrated educational supply chain management.

4 Finished product

Finished product are three major, as following
1 Graduated students with desirable characteristics including good virtues and morality, good knowledge and intellectual skills, good human relationship skills, good responsibility, good numerical analysis skill, good communication skill, and good information technology usage skills, etc.

2 Quality research outcomes may include problem solution, pure theory, thesis findings, internal and external projects applications, researchers, research publications, or research findings, etc.

3 Quality project outcomes namely internal projects and external projects

5 Consumer

The consumers mean the end-of-process component of an integrated supply chain model. As universities are part of the society, the final outcomes of supply chain, including graduates with desirable quality, quality research outcomes and quality project outcomes are delivered to the society [7],[8],[9],[10],[11].

Table 1: Appropriateness of main Components of An integrated supply chain model for educational management for higher education institutions in Thailand

ITems	\bar{X}	S.D.	Suitability
Suppliers	3.60	0.51	High
Service provider	3.60	0.69	High
Customers	3.60	0.51	High
Finished product	3.60	0.69	High
Consumer	3.60	0.51	High
Total	3.60	0.60	High

Table 1, The experts found that the overall elements of main Components of an integrated supply chain model for educational management for higher education institutions in Thailand has suitability in a high level. The arithmetic mean of 3.60 and standard deviation of 0.60.

Table 2: Appropriateness of suppliers of An integrated supply chain model for educational management for higher education institutions in Thailand

ITems	\bar{X}	S.D.	Suitability
Education suppliers	3.60	0.84	High
Research Suppliers	3.60	0.51	High
Project Suppliers	3.60	0.69	High
Total	3.60	0.68	High

Table 2, it can be seen that suppliers component are rated to be appropriate at the high level. The arithmetic mean of 3.60 and standard deviation of 0.68.

Table 3: Appropriateness of service provider of An integrated supply chain model for educational management for higher education institutions in Thailand

ITems	\bar{X}	S.D.	Suitability
Education	3.60	0.51	High
Research	3.60	0.51	High
Project	3.70	0.48	High
Total	3.63	0.50	High

Table 3, it can be seen that service provider component are rated to be appropriate at the high level. The arithmetic mean of 3.63 and standard deviation of 0.50.

Table 4: Appropriateness of customer of an integrated supply chain model for educational management for higher education institutions in Thailand

ITems	\bar{X}	S.D.	Suitability
Education customer	3.60	0.51	High
Research customer	3.60	0.69	High
Project customer	3.60	0.69	High
Total	3.60	0.63	High

Table 4, it can be seen that customer component are rated to be appropriate at the high level. The arithmetic mean of 3.60 and standard deviation of 0.63.

Table 5: Appropriateness of finished product of an integrated supply chain model for educational management for higher education institutions in Thailand

ITems	\bar{X}	S.D.	Suitability
Finished product	3.60	0.69	High
Total	3.60	0.69	High

Table 5, it can be seen that finished product component are rated to be appropriate at the high level. The arithmetic mean of 3.60 and standard deviation of 0.69.

Table 6: Appropriateness of consumers of an integrated supply chain model for educational management for higher education institutions in Thailand

ITems	\bar{X}	S.D.	Suitability
society	3.60	0.70	High
Total	3.60	0.70	High

Table 6, it can be seen that consumers component are rated to be appropriate at the high level. The arithmetic mean of 3.60 and standard deviation of 0.70

Table 7: Results of appropriateness evaluation of An integrated supply chain model for educational management for higher education institutions in Thailand

ITems	\bar{X}	S.D.	Suitability
Main components	3.60	0.60	High
Suppliers	3.60	0.68	High
Service provider	3.63	0.50	High
Customers	3.60	0.63	High

Table 8: Results of appropriateness evaluation of An integrated supply chain model for educational management for higher education institutions in Thailand (Cont.)

ITems	\bar{X}	S.D.	Suitability
Finished product	3.60	0.69	High
Consumer	3.60	0.70	High
Total	3.60	0.64	High

From Table 8 shows that the experts agree that An integrated supply chain model for educational management for higher education institute in Thailand results as shown in table 1, the appropriateness of details in an integrated supply chain model for educational management for higher education institutions in Thailand show the appropriateness was at the high score. ($\bar{X} = 3.60$, S.D =0.64)

4 Conclusion

After the experts agree that, an integrated supply chain model for educational management for higher education institutions in Thailand is considered to be high appropriate Suggesting that an integrated supply chain model for educational management for higher education institutions in Thailand to be appropriately applied in actual work settings.

5. Discussion

An integrated supply chain model for educational management for higher education institutions in Thailand is considered to be highly appropriate by the experts is probably due to the fact that the design model was relevant to Chansamut has studied supply chain in higher education [3],[4] In addition, with the study of Habib recommended that integrated supply chain [7],[8],[9] and the results are in accordance to those of Habib and jangthirapanich who found that integrated supply chain as well.

5 Recommendations

An integrated supply chain model for educational management for higher education institutions is high appropriate Therefore, if possible should be implemented in university for the model efficiently.

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