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Curriculum development, logistics and supply chain: Project Incubator and the development of integrated logistics and supply chain under the reform program of the National Curriculum

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Abstract
Thailand being one of the members of ASEAN Economic Community has to compete in the global economy. This has affected schools approach in preparing students in relation to AEC by a policy of curriculum development to produce work personnel who are knowledgeable and skillful. This research aims to 1. develop logistics and supply chains curriculum in high school, 2. study the effects of using the curriculum, logistics and supply chain, and 3. evaluate the satisfaction of using the curriculum of logistics and supply chain course. The samples were high school students who volunteered to study in the logistics and supply chain course. The total number of participants were 368: 320 lower secondary school students and 48 upper secondary school students. The instruments used in the research were: 1. unstructured interviews and semi-structured interviews, 2. evaluation of the appropriateness and consistency of the curriculum, 3. Students' achievement, and 4. students' satisfaction level of the logistics and supply chain course.

The results showed that: 1. The development of logistics and supply chain curriculum have the following elements: a) the requirements or policies of ASEAN AEC, b) government policy, c) development policy of the province, d) the structure of the course, and e) the involvement of the local community, and the curriculum is appropriate at a high level. 2. The achievement of the students in junior high and senior high school in all subjects showed that their average score in the post-test is higher than the pre-test with statistical significance of 0.01 level. The level of skills in logistics and supply chain in all subjects shows that the students' average scores are higher than their previous scores with statistical significance at the 0.01 level. 3. Students are satisfied with the logistics and supply chains course with a high mean level = 4.69 and standard deviation of 0.35.

Keywords: curriculum development / logistics and supply chain / curriculum reform / Incubation and Development of Integration

Introduction

The official establishment of ASEAN Economic Community (AEC) took place in 2015. This consortium of 10 member countries in ASEAN is expected to result in an increase in the

member countries' ability to negotiate and improve their respective nations and compete in the global economy. Thailand, one of the ASEAN member countries, has been considered as a hub of ASEAN and is in need to adapt itself to respond to the situations that would occur after AEC's establishment. These situations would be in the part of infrastructure and skilled labour development. One more thing that Thailand had to prepare for in order to be the centre of ASEAN, possessing strong characteristics, is the preparation of transport and logistics. Both the management and the development of workers improve the capabilities of logistics companies. Improvement of customs clearance method is also important, including the preparation of personnel in line with logistics adequately and with quality to meet demands in the future.

The higher education institutions are the important part in preparing future workforce in this field by educating them in relation to logistics and supply chain management. And, it is also necessary to prepare students in elementary and secondary schools to have a basic understanding of the logistics and supply chain in order to prepare them for higher learning (Office of National Economic and Social Development, 2012; the Office of the Basic Education, 2004; Office of the Provincial Strategy to develop the province, 2014; the Office of Phrae, 2013).

The importance of the abovementioned information is that it provides concept for the development of logistics and supply chain curriculum, which is of course linked to the activity of manufacturing and services to customers and consumers in order to deliver the value of products and services with the highest efficiency in terms of reasonable cost, quality, and time. This curriculum can be integrated in the contents or linked to various other courses to produce graduates with the knowledge and preparedness to be a competitive worker in the future. The course aims to provide students with basic knowledge of logistics and supply chain to be capable professional staff of the public and private sectors. The students who graduate under the program can become an entrepreneur, can continue to study at the university which offers higher education in this field, or be employed locally (Learning Reform Committee, 2000; the Office of the Basic Education, 2004; the Delegation of Thailand to UNESCO, 2006; the Ministry of Education, 2015).

Objectives

1. To develop logistics and supply chain course for secondary students
2. To study the effects of logistics and supply chain course for secondary students
3. To determine the satisfaction level for the logistics and supply chain course

Expected beneficial outcomes

1. The creation of a curriculum that seeks to achieve the instructional goals of the educational reform program of the National Education Curriculum. There are two logistics and supply chain courses developed, one for junior high school (lower secondary level 1-3) and one for senior high school (upper secondary level 4-5) for Sung Men Chanumpatham School, Phrae Province

2. The provision of a curriculum for developing students' skills and knowledge that can respond to the professions needed in Phrae Province

3. The development of learners in accordance with the strategic development of Phrae Province in preparation for the AEC

4. Development of a prototype curriculum for schools to develop students for their future profession, according to local conditions

Scope of Research

The population in this study were lower secondary and upper secondary students from Sung Men Chanumpatham School in Phrae Province which has 1190 students, 562 from the lower secondary level and 628 from the upper secondary level. The reason for choosing Sung Men Chanumpatham School in Phrae Province is that the province is considered a hub for logistics and transport; it is also located close to borders which facilitate trade. Students who participated in this study were chosen according to their voluntary enrolment in the logistics and supply chain course (Volunteer Sampling). The number of students who volunteered to join and study in the course were 368 students, 320 students were from lower secondary level (Matthayomsuksa 1-3) and 48 were from the upper secondary level (Matthayomsuksa 4-6).

Method

This part shows the methods, data gathering instruments used, and the process conducted to establish a research and development tool which was used for the whole study.

Figure 1

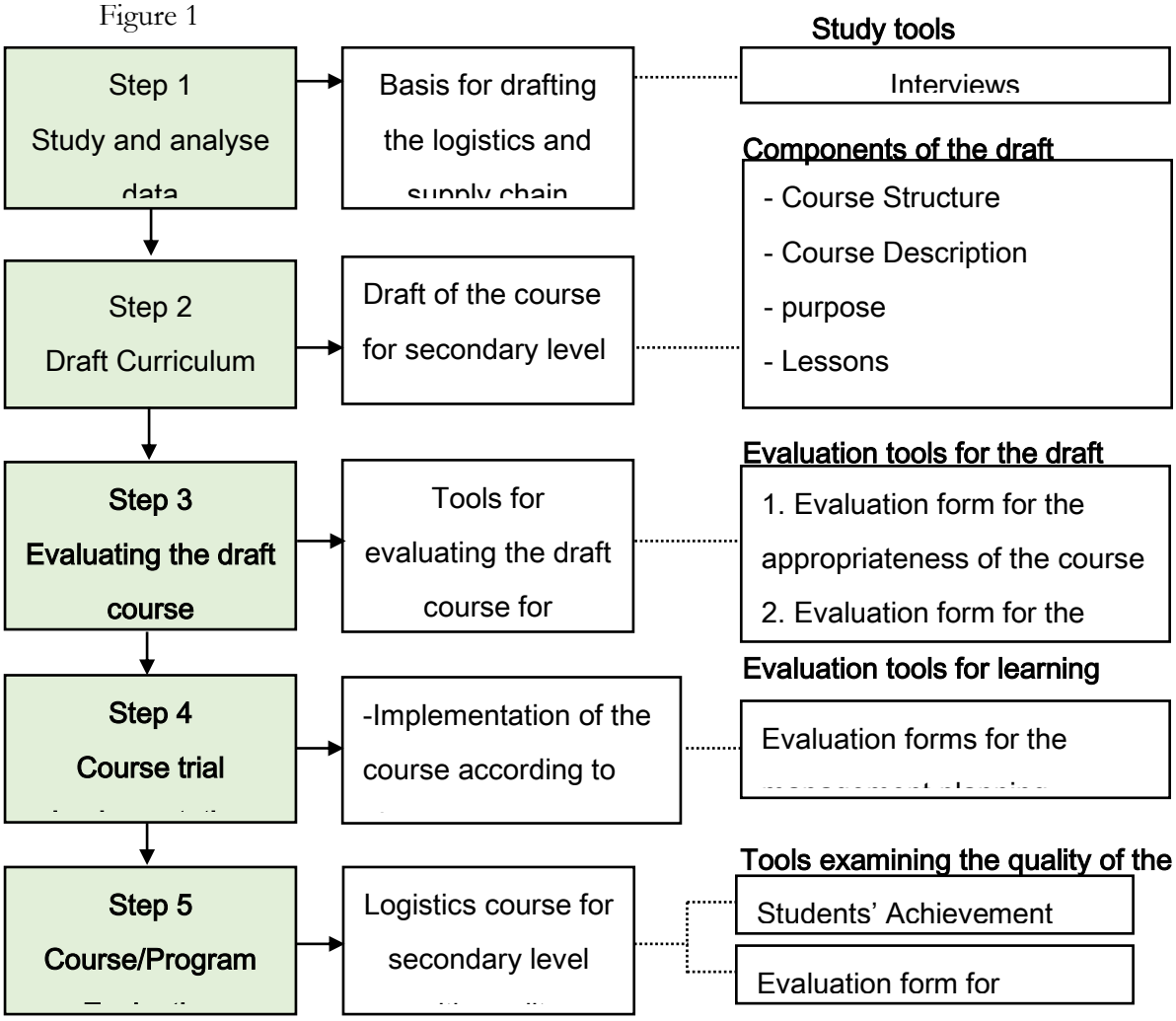

Diagram showing the process of logistics and supply chain curriculum development

Research results

1. Summary of the analysis of the development of logistics and supply chain curriculum

1.1 Elements of the curriculum development consist of the following: 1) the requirements or policies of ASEAN AEC, 2) government policy, 3) development policy of Phrae Province, 4) structure of the course consists of Required courses for 55 credits, lower secondary

level (Matthayomsuksa 1-3) 15 credits, the upper secondary level (Matthayomsuksa 4-6) 40 credits and 5) involvement of the community and local authorities.

1.2 Analysis of the experts' opinion found that the logistics and supply chain course is appropriate at a high level ($\bar{x}$ = 4.22, S.D.= 0.25) considering each aspect of the course. The one with the highest appropriateness level is learning, followed by the structure of learning unit, learning management, and the assessment and evaluation of learning. The consistency of the course has an average of 0.96; the teachers' handbook has consistency average of 0.91.

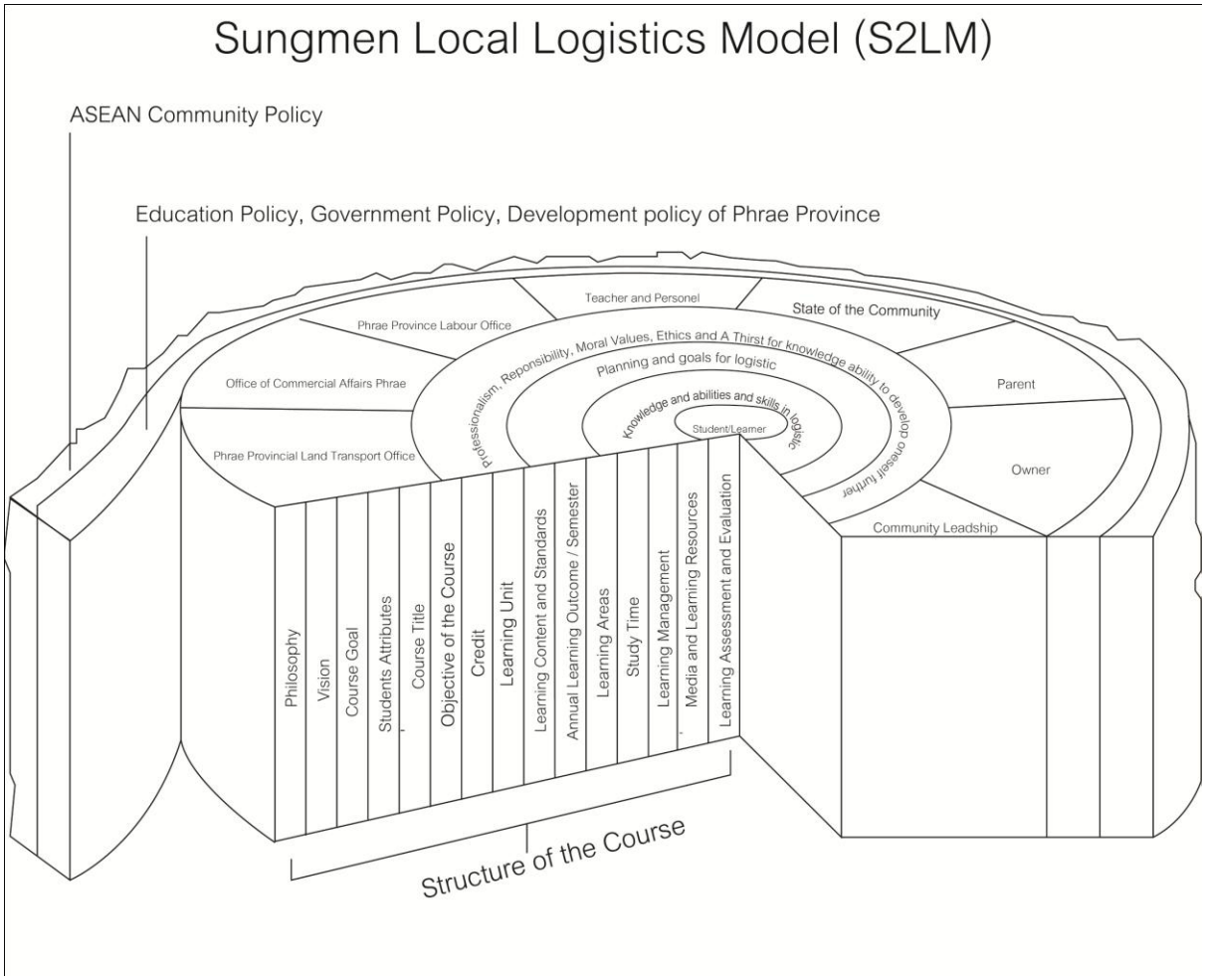

Figure 2. The second component of the development of logistics and supply chain curriculum

2. Summary of the analysis of the results of the study of logistics and supply chain course
The analysis of the result, after comparing the differences of the average of the pre-test and post-test result (before and after learning) of logistics and supply chain course in every subject, found that the students their post-test average score was significantly higher than their pre-test with statistical significance of 0.01 level.

3. Analysis of satisfaction of students who studied logistics and supply chain course found that the satisfaction of the junior high school with the course is at the highest level ($\bar{x}$ = 4.69, S.D.= 0.35). When considering each aspect, the three with the highest satisfaction levels were assessment and evaluation, learning activity, and content. The high school students' satisfaction of the course was also at the highest level ($\bar{x}$ = 4.84, S.D.= 0.33). When considering each aspect,

the four areas with the highest satisfaction levels were assessment and evaluation, content, teachers, and learning activities.

Discussions

The development and findings of the performance of logistics and supply chain curriculum at Sung Men Chanumpatham School in Phrae Province are discussed below.

1. The development of the curriculum of logistics and supply chain consists of the following elements: 1) the requirements or policies of ASEAN AEC, 2) government policy, 3) development policy of Phrae Province, 4) structure of the course, and 5) involvement of the community and local authorities. This is consistent with Pitayut Kongkhun (2012) who studied the use of community-based management in small schools. It was suggested that using community-based management in small schools has to have the following elements: 1) engagement with local government, 2) participation of parents, and 3) engagement of community members to build relationships.

2. Analysis of experts' opinion on the logistics and supply chain course showed that the course is efficient and has been implemented according to the development of the course. It has followed the correct procedures and curriculum development process, starting from studying the basic information of the school community and society considering all important aspects. In order to obtain a summary of the most needed information (Suni Phu Phan, 2003) and so that the course has consistency with the current situation, the content of logistics and supply chain course should be based on the local context in which students live.

Additionally, it should be consistent with the needs of society. To attain such consistency and relevance, assessment of the problems and needs of the society with the cooperation of experts and those involved in the development of multi-level courses that pass a systematic process is necessary. Prior to the implementation of the course, a study of the curriculum in basic education, teacher handbook, educational concept, theory in building the curriculum, documents related to the research which passed the examination of professional panel of experts, and passed the experts' assessment was done in this research.

This is consistent with the pattern of development mentioned by Wichai Wongyai (1994) regarding the evaluation of a program: to assess the quality of courses and study the feasibility of curriculum development, to improve before implementation. This is also consistent with the research of Sunanta Najareun (2004), Panphet Romsai, (2003) Supatra Pornsri (2003), and Suriya Gamthon (2010) who developed their curriculum using process of evaluation before curriculum implementation.

3. Achievements after studying logistics and supply chain course showed that the students obtained higher scores after the course study than before the course study. Differences were statistically significant at .01 level. This is attributed to the various learning management and diversity of activities such as group discussion and exploration, listening to explanations from individuals involved in the logistics and supply chain course.

As Vijaya Wongyai (1978) suggested, in order to make the learning the most effective, the teacher has to use a variety of teaching methods and activities by letting the students work as a group and let those who are slow learners to try to learn and finish their allotted work by themselves with minimal help while working with better students in the group. The less abled students will be proud of their work and the better students will also be proud of having helped

their slower classmates, and make the work of the group successful. Including the media to help students to learn more such as electronic books, multimedia can add to better understanding. This is consistent with what Thamrong Buasri (2000) found, stating that the media will help students have a better understanding and add to the lack or limitations of in class instruction. Media materials help reinforce students' understanding more.

4. The over-all satisfaction of the students with logistics and supply chain course was at a high level in each aspect: in the assessment and evaluation, in the content, with the teachers, and learning activities. The findings in this study are consistent with the research of Yupaphan Laehu (2012) who studied about the development of local learning unit by using authentic learning approach. The "Phra seng seuksa" for the students in Mathayom 1 found that the over-all satisfaction of the students with their study of a developed local unit is at the highest level.

This study employed course design based on the four main pillars of UNESCO (2004), and Daniel Sitarz (1994) suggestions, who noted that education is "learning to know, learning to do, learning to live together with others, and learning to be". Moreover, the social context, economic and environmental, as K.A. Freeman (1996) studied, were taken into account. The use of projects by integrating the learning environment on campus found that students can learn together well in an environment that was designed in their context. As a result, the students achieved success in their studies and were able to apply the knowledge they gained to various activities or to their work. Therefore, it can be concluded that designing the environment for learning is essential in the development of a local curriculum that fosters learning.

With regard assessment, assessment during the learning process is the natural way of evaluating, and it should be consistent with the information and the activities that were designed. In this kind of assessment, the students do not get bored nor tired and be happy while learning compared to the traditional way of teaching which involves mostly of repetition and rote learning. With this assessment, they can enjoy and be happy with studying (Wichai Wongyai, 2000). In this study, the course was designed to integrate learning in every level by using local community and school-based integration in teaching. As a result, the students had more understanding about the content and could learn better while achieving the standards and realising the purpose of the course (Office of the Education Council, 2007).

In this context of learning, it has been considered that activities should be organised by using the community as a base which provides information as guidelines of teachers in the learning management for the community and by the community in order to develop human resources with in the area to have knowledge, skills and desirable characteristics. Parents and the community could work together to help develop their own communities sustainably (Sompong Chantakhong, 2009). The learning contents can be reset to make it consistent with the core curriculum, and the locale of the students. It is also of importance to set the purpose of the subject and distribute the contents into manageable parts, so that learning units will not be too crowded. Contents need to be adjusted to match the conditions of each context of learning with consideration of the contents arranged from basic to difficult and their transitions.

Recommendations

1. Curriculum implementation feedback is stated in the following list.

1.1 Teachers should apply learning activities which allow for real or hand-on experiences such as allowing students to design products using local materials found in their area together, and let the people in the community who are in this kind of business be involved in the stages of the activity. Through this, logistics and supply chain course may help in developing a new career in the community that is consistent with its needs and potential.

1.2 Teachers may use the process of curriculum development to apply in another situation or subject of curriculum development in order to develop the quality of the curriculum, which is complete and consistent with the changes of the learning management in the 21st century.

1.3 Logistics and supply chain course can be an additional course to the school curriculum or core curriculum. The course may be taken by the end of normal class time and may take more time than the standard limit of time allotted to one regular subject depending on the adoption of each school, tailored to the context of the needs and conditions of that class.

2. Suggestions for future research

2.1 There should be a follow-up research about using the logistics and supply chain course and evaluate whether the course is suitable or not when the course is applied with teachers and students in a different area and community.

Conclusion

Logistics and supply chain course development is a part of preparing students' education and planning the process and stages in order to maintain consistency with and relevance to the changes in the present world as well as to the context of needs or policy of AEC, government policy, policy development of the province, the course structure, and the involvement of the community and local authorities. With such course development, each school adopting it would be able to respond to the policy of human resource development which could bring out the potential of the local community.

References

Culture about "Phetchabun Province" for 4th grade students. Retrieved: 1st March 2010 from http://tdc.thailis.or.th/tdc/search_result.php

Delegation of Thailand to UNESCO. (2006). *UNESCO with Education for Sustainable Development*. Tabloid news Delegation of Thailand to UNESCO., 13th June 2006.

Daniel Sitarz (ed.), *Agenda 21: The Earth Summit Strategy to Save our Planet*. Boulder, Colorado: EarthPress, 1994

Education Officer, Ministry. Office of the Education Council. (2007). *Research report "Methods to evaluate the success of education for employment. Strengthening Community / Local and the competitiveness of the country"*. Bangkok: Pleonstudio Company Co.,Ltd.

Freeman, K.A. (1996). *Attitude toward work in work project groups as predictors of academic performance.* Small Group Research.

Ministry of Education. (29 January 2015). *Prime minister's Office News 36/2015 Ministry of Education talked about the basic education reform*. Searched on 17th February 2015, from http://www.moe.go.th/websm/ 2015/jan/036.html.

Office of the Basic Education Commission. (2004). *Using the resources in the school and community*. Bangkok : Kurusapa Printing.

Office of the National Economic and Social Development. (2012). *National Social and Economic Development Plan* No. 11. (B.E.2012-2016). Bangkok.

Panphet Romsai. (2003). *Curriculum Development in social studies*, Religion and Culture about "Prachinburi Province" for 4th grade students. Retrieved: 1st March 2010 from http://tdc.thailis.or.th/tdc/search_result.php

Phrae Governor's Office. (2013). *Phrae province development plan (B.E.2014-2017).* Retrieved: 17th February 2015, from http://www.moe.go.th/websm/2015/jan/036.html.

Pittayut Kongkul. (2012). Using a community-based model for managing small schools. *Journal of Education and Social Development of the eight No. 2 Year 2012*. Retrived: 24th June 2014,from http://tdc.thailis.or.th/tdc/

Provincial Office of Strategy Development. (2014). *Province development plan (B.E.2014-2017).* Retrieved: 8th November 2012, from http://www.phrae.go.th/file_data/plan57-60.pdf

Sompong Jantakong. (2009). *The Community-Based Education for sustainable development*. Retrieved: 17th December 2014, from http://www.kroobannok.com/blog/24541.

Subcommittee of learning reform. (2000). *The learner is the most important in learning reform.* 5th ed. Bangkok: Board of Education.

Sunanta Najareon. (2004). *Curriculum Development in social studies, Religion and Tumrong Buasree.* (2000). The course focuses on learner-centered. Academic journal. (May 2000).

Sunee Phupan. (2003).*The basic idea of creating and developing curriculum*. Chiangmai: Chiangmai Saengsin Printing Co.,Ltd.

Supattra Polsree. (2003). *Curriculum Development in social studies, Religion and Culture about "Sakonakorn Province"* for 4th grade students. Retrived 1st March 2010 from http://tdc.thailis.or.th/tdc/search_result.php

Suriya Kamtorn. (2010). Curriculum Development in social studies, Religion and Culture about "Sufficiency economy" for 4th grade students at Naknimit School. *Thesis*. Srinakharinwirot University: Bangkok

UNESCO, (2004). *Education for All, The Quality Imperative, EFA Global Monitoring Report Education for All.* Published in 2004 by the United Nations Educational, Scientific and Cultural Organization.

Wichai Wongyai. (1994). *Curriculum and learning development process.* Bangkok: Suweeriyasan.

Wichai Wongyai. (1978). *Curriculum and learning devolopment.* Curriculum and learning subject. Srinakharinwirot University.

Yupapan Laehoo. (2012). Using authentic learning approach. The "Phra seng seuksa" for the students in Mathayom 1. *Master of Education Thesis in Teaching*. Taksin University.