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RICE Journal of Creative Entrepreneurship and Management (RJCM)
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About Us

RJCM is an international journal for academics and scholars at the higher education level to communicate and share their viewpoints and academic work with fellow professionals in the areas of creative entrepreneurship and management as practiced in their fields of specializations in social sciences.

RJCM publishes three numbers per volume annually and welcomes contributors to submit their manuscript in January, May, and September of each year. We accept both academic and research papers in social sciences from contributors.

The length of the unformatted manuscript in WORD can be 15-25 pages in length including references. The contents of the manuscript should include (1) a title with the author's name, affiliate, email address and telephone contact, (2) an abstract of 150 words with 3-5 keywords, (3) an introduction, (4) a rationale and background of the study, (5) research objectives, (6) research methodology, (7) data collection procedure, (8) data analysis, (9) results and discussion, (10) research limitation (if any), (11) conclusion, (12) the author's biography of about 50-80 words, (13) acknowledgement(s) (if any), (14) references, and (15) an appendix or appendices (if any).

All interested readers and paper contributors please contact Editor-in-Chief 2: Ruja Pholsward, Ph.D., Associate Professor, Rattanakosin International College of Creative Entrepreneurship (RICE), Rajamangala University of Technology Rattanakosin (RMUTR), <rujajinda@gmail.com>, <ruja.pho@rmutr.ac.th>. Please kindly note that website submission will be advised after the first editorial screening.

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Note from Editors of *RJCM* Volume 1 Number 2

Dear *RJCM* Readers,

You are now with our second issue in Year 1 of *RICE Journal of Creative Entrepreneurship and Management* (*RJCM*). This issue contains six articles in the areas of knowledge transfer, marketing communication, tourism business operations and technology, followed by educational management.

In this issue, we have four research papers in the areas of knowledge transfer, marketing communication, tourism business operations and technology: "*Evaluation of Knowledge Transfer Efficiency Based on the Synergy of Innovative Clusters"* (Article 1), *"Integrated Marketing Communication Model of Elderly Care Business in Thailand"* (Article 2), *"Factors Affecting an Increase in Flights to Nakhon Phanom Province: A Gateway to Great Mekong Subregion (GMS)"* (Article 4), *and "Construction of Multi Media to Add Value to Nostalgic Tourism for Aging Clients"* (Article 5). These articles give a clear picture of the tourism trend combining related subdisciplines in management.

We have two academic papers in this issue as well: one on hotel business adjustments in coping with the pandemic Covid-19 *"Hotel Business Management in Support of Customers after Covid-19"* (Article 3), and the other on the lingering question on Thai education management *"The Path to Excellence in Thai Education*" (Article 6). Our paper contributors are Chinese and Thai scholars from different universities: Chongqing University and Shihezi University in China; King Mongkut's University of Technology North Bangkok, Phuket Rajabhat University, Suratthani Rajabhat University, Dhurakij Pundit University, and Rajamangala University of Technology Rattanakosin—all in Thailand.

The editors-in-chief hope that the findings reported and discussed in these papers will be interesting to both researchers and practitioners who may share the same interest. If possible, the *RJCM* editorial team and the authors would appreciate hearing comments from our readers about the published work. We always welcome contributions from those who may wish to be part of our *RJCM* network.

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Address from RICE Director

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Dear *RJCM* Readers,

To materialize the vision of being *the university for entrepreneurial society* in promotion of the creative industry both in and outside Thailand, Rajamangala University of Technology Rattanakosin (RMUTR) has founded Rattanakosin International College of Creative Entrepreneurship (RICE) since 2018. RICE has its mission to develop and operate international programs that nurture entrepreneurial spirits and skills in students to foster the country's socio-economic advancement with their creativity in the specialized disciplines as well as competency in handling complex problem-solving tasks. This comes with the new challenges in the new world arena characterized by uncertainties as new normals, and rather unexpected patterns of interconnections across its boundaries.

RICE Journal of Creative Entrepreneurship and Management (RJCM) is developed as an international journal to disseminate research and academic papers in the fields of creative management and its related disciplines in diverse types of organizations and contexts. It is expected that both academics and practitioners can benefit from the published articles reporting findings of selected studies, current academic trends, and professional viewpoints. The journal is a scholarly peer-reviewed and fully referred to get a good impact in the international publication network.

In my view, this journal has an official role of RMUTR in supporting the University's goal on creating quality research work, as well as disseminating useful research findings and particularly, innovations in management science for applications both at the domestic and international levels. On these credentials, I hope that this journal will serve the identified purposes well and the editorial team will definitely try their professional best to work with paper contributors, reviewers and readers of publications.

With my best wishes for readers and paper contributors of *RJCM*.

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Evaluation of Knowledge Transfer Efficiency Based on the Synergy of Innovative Clusters

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Abstract

The study was to evaluate efficiency in knowledge transfer for decision support regarding *optimization* and promotion of knowledge transfer under the *synergy of innovation clusters*. The researchers studied the index system of knowledge transfer efficiency evaluation under the synergy of innovation clusters. Based on this, the researchers combined the subjective with objective weighting methods to propose (1) the quantitative weighting method of index weights, and (2) the comprehensive evaluation method of knowledge transfer efficiency. Also based on the actual application case, the researchers verified the proposed *index system* and *evaluation method* for feasibility and effectiveness. The results of the study indicated that a subjective and objective compound weighting method can be used to determine the weight of *the knowledge transfer efficiency index*. The *fuzzy comprehensive evaluation method* made it possible to evaluate knowledge transfer with accuracy and efficiency. Moreover, it was found that the use of a case study can help verify the effectiveness of the index system and evaluation method proposed in this study. It was expected that the reported findings could lay foundation for decision-making for optimization and promotion of knowledge transfer under the synergy of innovation clusters.

Keywords: *knowledge transfer efficiency, innovation clusters, sustainability, innovative methods, knowledge discovery*

1. Introduction

With the continuous development of network and information technology, the increasingly fierce market competition has put the internal and external environment for the survival and development of enterprises in greater complexity and dynamics, and the boundaries of enterprises have become rather blurred and flexible (Ren & Zhang, 2015). In the context of market competition, enterprises need to break through the original organizational boundaries and scale restrictions in the utilization and management of intellectual capital, such as information and knowledge, and lower the

information and knowledge barriers between organizations through extensive and in-depth knowledge collaboration with external organizations and enterprises. It is vitally important to build a smooth channel of knowledge exchange and transfer to achieve knowledge sharing and complementarity between organizations (Qi & Dong, 2007). *Innovative clusters* emerged out of the background of such developments. In a specific regional scope or industrial field, innovation clusters are based on the effective aggregation of human resources, information resources, and knowledge resources, and are coordinated with various clusters. Innovation is closely related to the innovation subject, through the role of social capital or relationship capital to form a collaborative relationship. This type of relationship is neither a "one-off" transaction relationship nor an "integration" authority relationship, but *a partnership* based on the principle of "equality, voluntary, long-term, stable, and reciprocal" (Liu, Yuan & Yi, 2012). In the process of *innovation cluster coordination*, the innovation subject realizes the transfer, sharing, and innovation of knowledge resources through this partnership, which effectively promotes the competitive advantage of the innovation cluster, and provides an inexhaustible driving force for the development and growth of the innovation cluster.

In the process of collaborative innovation, the innovation cluster main body realizes sharing, and innovation of knowledge through knowledge transfer, solves the problems encountered in engineering practice, and finally forms collaborative innovation results. In such a process, one of the major concerns focuses on how to attain effective knowledge transfer between innovation subjects and then improve knowledge transfer efficiency for management goals on innovation clusters. In this regard, there has been an acute need *to study the knowledge transfer efficiency of innovation clusters in collaborative innovation.* The evaluation of knowledge transfer efficiency under the synergy of innovation clusters is a complex decision-making issue involving various factors and indicators of knowledge transfer efficiency. In response to the influence of knowledge characteristics of knowledge transfer efficiency, Kogut & Zander (1992) conducted pioneering research. They proposed that the degree of explicit knowledge determines the efficiency of knowledge transfer. Quigley et al. (2007) pointed out that team-oriented incentives, member self-efficacy, self-goal setting, and trust relationship among members are important factors affecting the efficiency of knowledge sharing. Zhang & Zhang (2016) summarized the influencing factors of knowledge flow efficiency into dynamic factors, conditional factors, and capacity factors, namely, four factors of knowledge flow willingness, knowledge flow conditions, knowledge flowability, and network capacity. Wang & Zhang (2013) pointed out that the efficiency of knowledge flow in informal networks shows different changes due to the change of the intensity of the relationship between subjects. When the probability of change in relationship intensity takes a certain value, the knowledge flow shows a high flow rate and high average, the emergence characteristics of the knowledge level and the variance of low knowledge distribution.

Further, regarding the research level of *knowledge transfer efficiency evaluation system and method*, Chen et al. (2017) put forward the evaluation system and method of knowledge sharing efficiency between enterprises from the scope of knowledge authorization and depth. Wu & Pang (2017) evaluated the static knowledge exchange efficiency of the academic community based on the

SBM model and studied the dynamic evolution of knowledge exchange in the virtual academic community. Zhu et al. (2017) constructed an evaluation system of practical community knowledge flow efficiency in four aspects: knowledge flow level, knowledge innovation level, knowledge application level, and knowledge perception level. Yang, Hu & Liu (2015), Huang, Zhuang & Yao (2012) used the average knowledge stock, knowledge stock coefficient of variation, and knowledge diffusion speed to measure and evaluate the knowledge sharing efficiency in complex network contexts.

Based on the comprehensive analysis of the above research results, we have found that the research on knowledge transfer mainly focuses on knowledge transfer mode, knowledge transfer influencing factors, and quantitative evaluation methods, *but lacks systematic and in-depth evaluation of knowledge transfer efficiency under the collaborative cluster collaborative situation.* The researchers therefore would like to study knowledge transfer efficiency evaluation under the synergy of innovation clusters; this was to systematically analyze the knowledge transfer efficiency *evaluation index system* under the collaborative cluster collaborative situation, and propose corresponding quantitative evaluation methods of knowledge transfer efficiency in an innovation cluster. It was expected that the cluster enterprises can provide theoretical basis and decision support for knowledge transfer efficiency.

2. Literature Review and Research Analysis

This section deals with literature review and research analysis on (1) the knowledge transfer efficiency evaluation index system under innovation cluster collaboration, and (2) the knowledge transfer efficiency evaluation method.

2.1 Knowledge Transfer Efficiency Evaluation Index System under Innovation Cluster Collaboration

The selection of an *evaluation index* of knowledge transfer efficiency under the synergy of innovation clusters is a complex system. It is necessary to adopt scientific and rational *selection principles and methods*, select the most important knowledge transfer efficiency *evaluation indicators* for analysis and treatment, and finally form a scientific and reasonable *evaluation index*. The system can achieve a comprehensive and accurate evaluation of knowledge transfer efficiency under the synergy of innovation clusters with reasonable accuracy and cost range.

Knowledge transfer is a process in which knowledge subjects are exchanged, acquired, learned, and utilized with knowledge sources through a certain transfer environment or medium to realize knowledge increment and knowledge innovation. Szulanski (1996) asserted that the factors affecting knowledge transfer performance should include five aspects: knowledge transfer *source*, knowledge transfer *recipient*, knowledge transfer *content*, knowledge transfer *approach*, and knowledge transfer *scenario*. Hu (2009) proposed that knowledge sharing evaluation indicators in network organizations should be analyzed in four dimensions: cognitive gaps among network *members*, knowledge-sharing *environment*, knowledge-sharing *coordination behavior*, and knowledge-sharing *results*. From the perspective of knowledge sharing process analysis, Li (2009) divided *the index system* of knowledge sharing efficiency evaluation into three levels: *individual, organization,*

and platform. Based on the above research results and thinking, the researchers constructed the knowledge transfer efficiency under the synergy of innovation clusters in four dimensions: knowledge transfer *subject characteristics,* knowledge *content characteristics,* knowledge transfer *environment*, and knowledge transfer *coordination behavior*.

The four dimensions in the evaluation system were explained by the earlier researchers. In the process of innovation cluster coordination, *the knowledge transfer subject* refers to the knowledge sender and the knowledge receiver participating in the knowledge transfer activity; and the knowledge transfer is the knowledge exchange interaction process between the knowledge sender and the knowledge receiver (Han, 2013). Knowledge senders and knowledge recipients can exchange roles for specific knowledge. In the *cluster knowledge collaboration*, the knowledge transfer subject has different knowledge types and stocks; there is a knowledge potential difference between the subjects. The knowledge potential difference represents the precondition for knowledge transfer and the driving force of knowledge transfer (Wang, Zhao & Yang, 2009). Willingness of knowledge transfer of knowledge subjects is an important factor for a smooth progress of knowledge transfer. A large number of studies have shown that willingness to transfer knowledge has a significant positive effect on the efficiency of knowledge transfer. The stronger willingness to transfer knowledge, the more active and effective communication and knowledge resource sharing (Chen & Zhao, 2008). The ability of knowledge transfer also has a positive effect on the efficiency of knowledge transfer. The knowledge transferability can be further subdivided into the knowledge sending ability of the knowledge sender and the knowledge absorption ability of the knowledge receiver. The stronger the knowledge transferability of both sides of knowledge transfer, the less difficult and sticky the knowledge transfer, and thus resulting in greater efficiency of knowledge transfer (Li & Li, 2011). On the other hand, the degree of trust and reciprocity between knowledge transfer subjects also have a positive effect on the efficiency of knowledge transfer. Research shows that the degree of trust and reciprocity between knowledge subjects is conducive to the acquisition of new information and new knowledge, and reduced opportunistic behavior and free-riding behavior between subjects (Wang & Huang, 2016). Finally, in the innovation cluster, the embedding of the knowledge transfer subject has a positive impact on the formation of good knowledge cooperation norms between knowledge subjects, which can help the knowledge subjects to acquire more heterogeneous knowledge (Mccall et al., 2008).

Knowledge content refers to the data, information and knowledge exchanged and transferred between the subjects of knowledge transfer (Fang and Wang, 2010). The knowledge in the innovation cluster is the same as general knowledge. It can also be divided into two categories, *explicit* knowledge, and *tacit* knowledge. The degree of explicitness of knowledge largely determines the difficulty of knowledge transfer between knowledge subjects. A large number of studies have shown that there is a significant positive correlation between the degree of explicit knowledge and the efficiency of knowledge transfer (Qu, 2012). The degree of *systematization* of knowledge refers to the extent to which an organization embeds knowledge into organizational processes and norms based on knowledge preservation. The

higher the degree of systematization of knowledge, the higher the ability of organizations to absorb and integrate knowledge, and the higher the efficiency of knowledge transfer among knowledge subjects (Peng, 2005). On the other hand, the source and use of knowledge also have an important impact on knowledge transfer. The source of knowledge will determine the content of knowledge to a certain extent. The difficulty of obtaining the source of knowledge will determine the difficulty of knowledge transfer, and thus positively affect the efficiency of knowledge transfer. The use of knowledge determines the search for specific knowledge and the judgment and cognition of the content of knowledge content to a certain extent so that the subject of knowledge has a certain purpose in the process of knowledge-seeking and acquisition. The more they use large and broad knowledge, the more purposeful the initiative of knowledge-seeking, and thus the positive impact on the efficiency of knowledge transfer (Feng & Tian, 2005).

Knowledge transfer takes place in a specific *environment.* The knowledge transfer environment is the basis in support of knowledge management and an important *synergistic factor* for achieving knowledge transfer. Organizational culture is one of the most important environmental factors of knowledge transfer. Whether cluster culture attaches importance to the strategic role of knowledge, whether to encourage open and in-depth knowledge exchange within the cluster has a great impact on the efficiency of knowledge transfer (Ajmal & Koskisen, 2010). Both sides of the knowledge transfer entity have their own institutional and cultural background. The compatibility and matching degree of cognitive structure and management system directly affect the efficiency of knowledge transfer. Similarly, the incentive mechanism of knowledge transfer activities within clusters plays an important role in mobilizing the enthusiasm of knowledge transfer activities and improving the performance of knowledge transfer. Based on this, the fairness of knowledge collaboration procedures and benefit distribution between knowledge transfer subjects is an institutional guarantee to ensure that both partners can carry out deep knowledge collaboration, and it also has a significant impact on knowledge transfer efficiency. Open knowledge exchange, smooth knowledge exchange platform, and diversified knowledge transfer media and channels are important guarantees for the smooth progress of knowledge transfer activities, which reduce the uncertainty and ambiguity of knowledge transfer and ensure the quality effect of knowledge transfer in the form of a positive effect.

Knowledge transfer pays attention to the knowledge and *behavior* activities and interaction *coordination* between enterprises within the cluster. Only by conducting mutual knowledge coordination and coordination behavior can enterprises improve the efficiency of knowledge transfer (Hu, 2009). In the process of innovation cluster coordination, there is a dynamic and complex knowledge exchange relationship between *cluster enterprises*. Therefore, enterprises need to use scientific and reasonable coordination mechanisms to deal with the uncertain knowledge exchange environment to complete complex knowledge collaboration tasks. First of all, the communication between the cluster enterprise managers helps the company to better discover the advantages and disadvantages of both parties, to better exert the knowledge superiority of the enterprise and form the complementary advantages of knowledge

collaboration. Therefore, *communication between managers* is an effective means to improve the efficiency of knowledge transfer. Secondly, because a large amount of knowledge in the process of cluster collaborative innovation is *tacit* knowledge, it requires in-depth knowledge exchange and communication between employees of different enterprises. Only through extensive and close communication among employees in the cooperative task can knowledge exchange and transfer be realized. The implementation of the system can create a good knowledge transfer and sharing atmosphere, and thus improve the efficiency of knowledge transfer, especially the transfer efficiency of tacit knowledge (Du et al., 2017). Finally, due to the insufficient information and asymmetry of the cooperative enterprises in the *cluster coordination*, there are cognitive biases in the knowledge transfer problem in cooperation, which requires the constraint and adjustment of the cooperation contract to achieve continuous improvement of knowledge transfer behavior under cluster coordination (Li, 2009).

Based on the above research analysis, *the index system* for evaluating knowledge transfer efficiency under the synergy of innovative clusters is shown in Table 1 below:

Table 1: The Knowledge Transfer Efficiency Evaluation Index System under Innovation Cluster Collaboration

Primary indicator	Secondary indicators	Three-level indicators
Knowledge transfer efficiency	The subject of knowledge transfer	The knowledge gap between knowledge transfer subjects
		Willingness to transfer knowledge
		Knowledge transferability
		Degree of trust between subjects
		Degree of reciprocity between knowledge transfer subjects
		Cluster embedding of knowledge transfer subject
	Knowledge content characteristics	Degree of explicit knowledge
		Systematization of knowledge
		Source of knowledge Use of knowledge
	Knowledge transfer environment	Knowledge exchange culture within the cluster
		Institutional compatibility between subjects of knowledge transfer
		Collaborative procedures and the fairness of benefit distribution
		Knowledge exchange platform
	Knowledge transfer oordination behavior	Knowledge transfer medium and approach
		Communication between cluster enterprise managers
		Communication between employees in cluster enterprises
		Design and adjustment of cooperation contract

2.2 Knowledge Transfer Efficiency Evaluation Method

As for the efficiency evaluation of knowledge transfer being determined under the cooperation of clusters, the validity of the knowledge transfer efficiency evaluation results mainly depends on two factors: one is the determination of *the weight* of each evaluation index of knowledge transfer efficiency, and the other is the *comprehensive evaluation.* These two factors are explained in two sections 3 and 4.

3. Determination of Weights of Evaluation Indicators Based on Ahp-Entropy Weight Method

In the process of knowledge transfer efficiency evaluation, the determination of index weight is the most important link, and it is also the key to ensure the success of knowledge transfer efficiency assessment. At present, the method for determining the weight of indicators can be divided into two major categories: one is the *subjective* weighting method, including the Delphi method, the ancient forest method, the analytic hierarchy process, the fuzzy comprehensive evaluation method, etc.; the other is the *objective* weighting method, including Deviation maximization method, mean difference method, and threshold method. Both the subject and subjective weighting methods have their advantages and disadvantages and the field of application. The subjective weighting method can evaluate the subjective preference of the subject in a good system, but because the subjective judgment of individuals often differs, the indicators confirmed by this method lack weight stationarity; and the calculation of weights is difficult and the objectivity is poor. In contrast, the weights confirmed by *the objective weighting method* are very objective, but because the amount of information on the main data of the indicators is relatively small, there will be problems with different indicator weights and different truth and importance levels of indicators. Another disadvantage is that the confirmation of the weight will be interfered with by the randomness of the sample data. Different sample data will obtain different weight values (Yang, 2006).

According to the above analysis, the researchers proceeded to use *subjective* composite methods of the ahp method and the entropy weight method to determine the index weight of knowledge transfer efficiency. The evaluation index system of knowledge transfer efficiency under the synergy of innovation cluster has multi-objective and multi-level characteristics, and the evaluation factors carry ambiguity and qualitative characteristics. The use of ahp analytic hierarchy method has the following shortcomings: First, the ahp method is used as the subjective weighting method. When constructing the decision matrix, the evaluator often determines the weight value according to its subjective judgment, so the evaluation result will be the evaluator's experience, self-perception and other errors leading to large differences. Second, the ahp method ignores the situation in which all evaluators assume that a certain indicator is more critical and therefore has a high value; as a result, the weight given by the ahp method is also relatively high, and discriminative power of this indicator is proportionally reduced--leading to the decline of the effectiveness of this evaluation index. In order to solve the above problems in the ahp method, the researchers introduced *the entropy weight method*, an objective weighting method, *to modify the ahp method*, reduce the subjectivity of the weight determined by

the ahp method, and appropriately reduce the weights of those indicators with lower discriminative power. The subjective and objective empowerment combined static and dynamic empowerment methods to improve the rationality and effectiveness of the evaluation index weights.

1 Ahp Method to Determine the Weight of the Indicator

1) Constructing an evaluation index system

Under the premise of comprehensively grasping the index system of knowledge transfer efficiency evaluation, the relationship between the structure of the indicator system and the indicators at each level is analyzed, and the indicator system is divided into multiple levels, including the target layer, the standard layer, and the indicator layer (Yang, Zhu & He, 2007).

(1) Target layer: There is often only one element in the target layer, which is the main basis for the evaluation of the ahp method. The target layer elements usually represent the issues that need to be addressed or the goals that are expected to be achieved. In this paper, the target layer represents the evaluation of the efficiency of knowledge transfer under the synergy of innovation clusters.

(2) Standard layer: This level contains the central link involved in accomplishing the goal or dealing with the problem. It can be composed of partial levels. The standard layer in this paper represents two four-level indicators for the evaluation of knowledge transformation efficiency of the innovation cluster.

(3) Indicator layer: It can also be called the program layer. It represents the various measures and programs that can be selected to accomplish the goal. It is the visualization of the evaluation target. This paper refers to the indicators in the innovation cluster for the knowledge transfer efficiency evaluation system.

2) Construct a pairwise comparison decision matrix

When constructing the two-two ratio decision matrix, the evaluator first needs to assign a certain scale value to the relative importance of each evaluation index. As shown in Tables 2 and 3, this paper uses a scale of 1-7. The results obtained by comparing the importance of the two elements between the elements to constitute the decision matrix, as shown in Table 4.

Table 2: The Definition of Judgment Matrix

1	Representing the comparison of 2 indicators, with consistent importance.
3	Representing the comparison of two indicators, one indicator is more important than the other.
5	On behalf of the comparison of two indicators, one indicator is more important than the other one.
7	On behalf of two indicators, one indicator is more important than the other.
2，4，6	The median value between the above two separated judgment values.

Table 3: The Definition of Judgment Matrix

1/3	Representing the comparison of two indicators, one indicator is secondary to the other.
1/5	On behalf of the comparison of two indicators, one indicator is more secondary than the other one.
1/7	On behalf of the comparison of two indicators, one indicator is extremely secondary to the other.
1/2，1/4，1/6	Median between the two separated decision values described above.

Table 4: The Judgment Matrix

U	A_1	A_2	……	A_h
A_1	α_{11}	α_{12}	……	α_{1n}
A_2	α_{21}	α_{22}	……	α_{1n}
……	……	……	……	
A_h	α_{n1}	α_{n2}	……	α_{nn}

The decision matrix $A=\left(a_{ij}\right)_{m\times n}$ has the following characteristics:

$$a_{ij}>0 \quad a_{ij}=\frac{1}{a_{ji}} \quad a_{ij}\cdot a_{jk}=a_{ik} \tag{1}$$

3) Calculate the relative importance of the evaluation indicators

The evaluation index relative importance vector $W=(W_1,W_2,\cdots,W_n)^T$ is calculated by:

(1) Seeking law (arithmetic averaging method)

$$W_i=\frac{1}{n}\sum_{j=1}^{n}\frac{a_{ij}}{\sum_{k=1}^{n}a_{kj}},i=1,2,\cdots,n \tag{2}$$

Calculation steps: a. The elements of matrix A are normalized by column, ie $\frac{a_{ij}}{\sum_{k=1}^{n}a_{kj}}$; b. each column after normalization is added; c. dividing the added vector by n Weight vector.

(2) Square root method (geometric average method)

$$W_i=\frac{\left(\prod_{j=1}^{n}a_{ij}\right)^{\frac{1}{n}}}{\sum_{i=1}^{n}\left(\prod_{j=1}^{n}a_{ij}\right)^{\frac{1}{n}}},i=1,2,\cdots,n \tag{3}$$

Calculation steps: a. The elements of matrix A are multiplied by rows to obtain a new vector; b. Each component of the new vector is opened n power; c. The resulting vector is

normalized to obtain a weight vector.

(3) Characteristic root method

$$AW = \lambda_{\max} W \tag{4}$$

It can be known from the positive matrix Perron theorem that $\lambda_{\max}$ exists and is unique, and the vector of W is a positive vector, which can be obtained by the power method $\lambda_{\max}$ and the corresponding feature vector W.

4) Consistency test

The consistency index $C.I.$ is calculated according to formulas (7) and (8).

$$C.I. = \frac{\lambda_{\max} - n}{n-1} \tag{5}$$

$$\lambda_{\max} \approx \frac{1}{n}\sum_{i=1}^{n}\frac{(AW)_i}{W_i} = \frac{1}{n}\sum_{i=1}^{n}\frac{\sum_{j=1}^{n} a_{ij}W_j}{W_i} \tag{6}$$

Then find the corresponding average random consistency indicator $R.I.$ Table 5 gives the average random consistency index obtained by calculating the $1\sim14$ order positive reciprocal matrix 1,000 times.

Table 5: The Average Random Coherence Indexes

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14
$R.I.$	0	0	0.52	0.89	1.12	1.26	1.36	1.41	1.46	1.49	1.52	1.54	1.56	1.58

The average random consistency index $R.I.$ is the mean of the consistency index of the same hierarchical random decision matrix. The introduction of $R.I.$ can avoid the disadvantage that the consistency judgment index increases significantly with the increase of n.

Finally, the consistency ratio $C.R.$ is calculated. If it is $C.R. = \frac{C.I.}{R.I.} < 0.1$, the consistency test is passed, and the judgment result obtained is considered to be reasonable.

2 Entropy Weight Method to Correct Index Weights

The concept of entropy stems from thermodynamics and was later introduced to information theory by Shannon. According to the definition and principle of entropy, *the entropy value can be used as a measure of the amount of effective information provided by the system*, representing the degree of disorder of a system. The entropy weight method is an objective weighting method combining qualitative and quantitative analysis. The entropy weight method determines the index weight according to the amount of information that each indicator passes to the decision-maker. For the evaluation question, there are m evaluation targets, n evaluation indicators, and the original evaluation matrix $X=(x_{ij})_{m\times n}$ is obtained, and x_{ij} indicates the value of the j evaluation index of the i evaluation object （Xie & Zhong, 2002). Then the

entropy value of the j evaluation index x_j

$$\eta_j = -\frac{1}{\ln m}\sum_{i=1}^{m}\kappa_{ij}\ln\kappa_{ij} \tag{7}$$

In the formula $\kappa_{ij} = x_{ij} \Big/ \sum_{i=1}^{m} x_{ij}$, κ_{ij} represents the proportion of the i the part of the target under the j indicator. According to the definition and principle of entropy, the larger the entropy value of an index, the larger the effective information provided by the index, indicating that the less effective information is supplied by this factor, the smaller the function in the system evaluation. The smaller the weight value is, on the contrary, the larger the entropy value, the more effective information the index provides; and the greater the function in the comprehensive evaluation, the greater the weight. The process of correcting the ahp method by the entropy weight method is as follows (Ni et al., 2009):

1) Do a dimensionless processing matrix $Y=(y_{ij})_{m\times n}$ on the X matrix, that is,

$$y_{ij} = \frac{x_{ij}}{\left[\sum_{i=1}^{m} x_{ij}^{\,2}\right]^{\frac{1}{2}}} \tag{8}$$

i=1,2,3...,m; j=1,2,3...,n。

i 2) Calculate κ_{ij}, which is the proportion of the j th target indicator.

$$\kappa_{ij} = \frac{y_{ij}}{\sum_{i=1}^{m} y_{ij}} \tag{9}$$

3) Calculate the entropy value η_j of the index j.

$$\eta_j = -\frac{1}{\ln m}\sum_{i=1}^{m}\kappa_{ij}\ln\kappa_{ij},\ (j=1,2,3...,n) \tag{10}$$

Where, $0 \le \eta_j \le 1$.

4) Calculate the difference coefficient χ_j of the j indicator.

$$\chi_j = 1-\eta_j \tag{11}$$

For the j indicator, the larger the χ_j is, the greater the effect of the indicator on the evaluation of the scheme; conversely, the smaller the χ_j, the smaller the effect of the indicator on the evaluation of the scheme.

5) Calculate the weight w_j of the j indicator.

$$w_j = \frac{\chi_j}{\sum_{j=1}^{n}\chi_j} \tag{12}$$

3 Entropy Weight Method Adjusts the Weight of the ahp Method Index

For ahp to obtain the subjective weight of each indicator, the objective w_j obtained by the entropy method has the right to adjust.

$$w_j'' = w_j'.w_j \tag{13}$$

Among them, w_j' represents the index weight value obtained by the ahp method.

Normalize the w_j'' to get the final adjusted weight W_j .

$$W_j = \frac{w_j''}{\sum_{j=1}^{n} w_j''}, \; j = 1,2,3...n \tag{14}$$

4. Fuzzy Comprehensive Evaluation Method of Knowledge Transfer Efficiency

The evaluation of knowledge transfer efficiency under the synergy of innovation clusters is a very complex and ambiguous system engineering, which contains many problems and factors that are ambiguous and difficult to accurately quantify. It is often difficult to obtain fully sufficient data in the evaluation process. Aiming at this ambiguous feature of knowledge transfer efficiency evaluation, *the researchers intended to use a fuzzy comprehensive evaluation method to comprehensively evaluate the knowledge transfer efficiency under the synergy of innovation clusters.* Specifically, the evaluation of knowledge transfer efficiency under the synergy of innovation clusters is a complex multi-objective comprehensive evaluation problem. Knowledge transfer efficiency evaluation involves multidisciplinary knowledge, such as collaborative innovation theory, cognitive psychology, cluster theory, and knowledge management theory. Besides, when evaluators evaluate the efficiency of knowledge transfer under the synergy of innovation clusters, the comments they use often have some ambiguity. Therefore, this paper proposes the following comprehensive evaluation method of knowledge transfer efficiency under the synergy of innovation clusters; that is, based on the weight of the knowledge transfer efficiency evaluation index determined by the ahp method and the entropy weight method, the fuzzy evaluation matrix is established, and finally, the fuzzy comprehensive evaluation method is used in the innovation cluster for coordinated knowledge transfer efficiency in a comprehensive evaluation.

The calculation process of the fuzzy comprehensive evaluation method is as follows (Tang, 2012):

1) First determine the evaluation level model

(1) Set of factors for evaluating objects

A set of factors is a collection of rating indicators, generally:

$$U = \left(U_1, U_2 \cdots U_n\right) \tag{15}$$

(2) Determine the assessment set v

The evaluation set is a collection of evaluation levels given by the evaluation subject, generally:

$$V = \left(V_1, V_2, \cdots V_q\right) \tag{16}$$

In general, the number of comment levels q is an integer between $[3,7]$. If the q is too large, the evaluation level is difficult to describe, and it is difficult to determine the level of the comment; if the q is too small, the quality requirements of the fuzzy comprehensive evaluation cannot be achieved. Usually, q takes an odd number, so there is an intermediate level to distinguish the rating of the evaluation object. The specific level can be determined by the evaluation expert according to the content and characteristics of the evaluation object and described in an appropriate language.

(3) Establishing a fuzzy mapping relationship between factor set and evaluation set

Establish a fuzzy mapping from u to v, ie:

$$f: U \to F(V)$$

$$u_i = f(u_i) = m_i = (m_{i1}, m_{i2} \ldots m_{iq}) \tag{17}$$

A single factor evaluation matrix m is obtained.

$$M = \begin{pmatrix} m_{11} & \cdots & m_{1q} \\ \vdots & \ddots & \vdots \\ m_{n1} & \cdots & m_{nq} \end{pmatrix}$$

Among them, m_{ij} is the affiliation of the factor U_i in U and the level V_j in V.

Here, $m_{ij}=$

(4) Determine the evaluation factor weight vector w

Since the factors in the evaluation factor set U are not the same importance to the evaluation object, each factor needs to be given different weights, namely $W=(w_1, w_2, ..., w_n)$.

The regulations are:

$$\sum_{i=1}^{n} w_1 = 1, w_i \geq 0, (i = 1,2,3,...,n) \tag{18}$$

(5) Select a synthetic operator for the comprehensive evaluation

The basic model of the fuzzy comprehensive evaluation method can be expressed as:

$$R = W \square M \tag{19}$$

In the basic formula $R=W\square M$ of the fuzzy comprehensive evaluation model, the synthesis of W and M has a very important influence on the final evaluation result, so the selection of the fuzzy synthesis operator "·" is very important. The synthetic operators often used in the fuzzy comprehensive evaluation include main factor determination type, main factor prominent type, unbalanced average type, and weighted average type. The evaluation of knowledge transfer efficiency under the synergy of innovation clusters is a multi-index and multi-level comprehensive evaluation problem, which needs to balance the relative importance of each factor and its impact on the overall evaluation results. Therefore, according to the above analysis, the researchers selected the weighted average type, synthesis operator. Then, by calculation, we got $R=(r_1, r_2, ..., r_q)$. If the result of the fuzzy comprehensive

evaluation is $\sum_{i=1}^{n} r_i \neq 1$, , it should be normalized first.

2) Multi-level fuzzy comprehensive evaluation model.

Based on the comprehensive evaluation of the low-level factors, the low-level factor evaluation results are used to comprehensively evaluate the high-level factors. The evaluation process is as follows:

(1) The evaluation factor set U is divided into P subsets, denoted as $U=(U_1,U_2,...,U_p)$, with i subsets $U_i=(U_{i1},U_{i2},...,U_{ik})$, $(i=1,2,3,...,p)$.

(2) For each subset U_i, a comprehensive evaluation is performed according to the first-level model. Let U_i correspond to the weight set W_i, and the U_i corresponding fuzzy evaluation matrix to M_i, then:

$$R_i = W_i \square M_i = (r_{i1}, r_{i2}, ..., r_{im}) \quad (i=1,2,3,...,p) \tag{20}$$

(3) Consider R_i, which is the evaluation of each subset U_i in the factor set U, as P single-level evaluation in U. Set the weight distribution set to W, then the total fuzzy evaluation matrix is:

$$R = \begin{bmatrix} R_1 \\ R_2 \\ \cdots \\ R_p \end{bmatrix} = (r_{ij})_{pm} \tag{21}$$

The secondary rating results are:

$$R=W \square M \tag{22}$$

The calculation result of the above formula is the comprehensive evaluation result of the factor subset $U_1,U_2,...,U_p$ and the comprehensive evaluation result of all the factors in the evaluation factor set U. The first step to the third step can be repeated several times according to the number of levels until the final satisfactory comprehensive evaluation result is obtained.

5. Application Case

The researchers took the Chongqing electronics industry innovation cluster as the research object and evaluated its knowledge transfer efficiency under the cluster innovation cooperation. The electronics industry is a pillar industry in Chongqing's industrial economy. In 2016, Chongqing's electronics industry surpassed the automobile manufacturing industry and became the first driving force for Chongqing's industrial output growth. The output value was 499.9 billion yuan, contributing more than industrial output growth: 30%, reaching 33.8%. In 2017, the output value increased by 27.5% year-on-year, accounting for 24.1% of the city's industrial output value. The contribution rate to the city's industrial output growth reached 41.3%, becoming the “first catcher” for the steady growth of Chongqing's GDP.

Through the data collection and on-site investigation of mobile phone manufacturers and mobile phone supporting enterprises in the Chongqing electronic industry cluster, the researchers collected the first-hand data and information of knowledge transfer efficiency evaluation. Based on the evaluation index system and comprehensive evaluation method of knowledge transfer efficiency under the innovation cluster proposed in this paper, the process of evaluating and analyzing the knowledge transfer efficiency of Chongqing electronic industry innovation cluster is as follows:

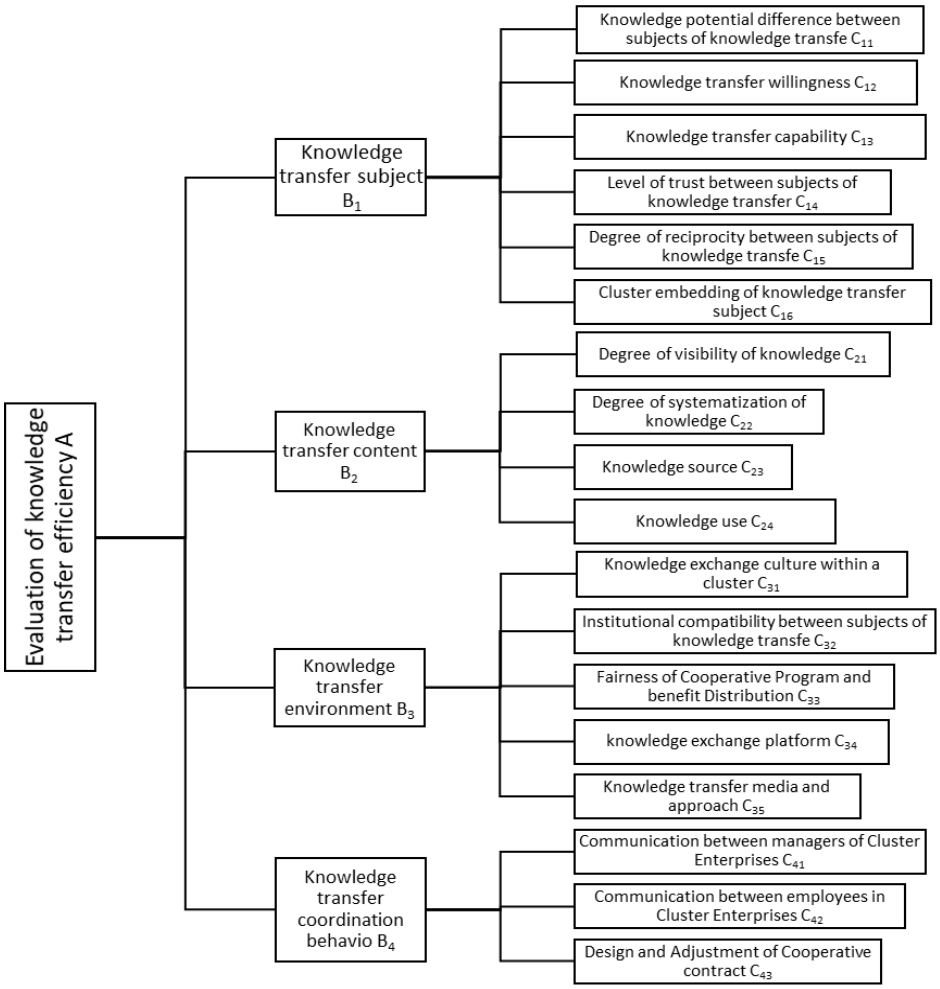
5.1 Knowledge transfer efficiency index weight determination

1 Apply the ahp method to determine subjective weights

1) The hierarchical structure of the structural evaluation system

According to Section **3** (on entropy weight method adjusts the weight of the ahp method index), the index system of knowledge transfer efficiency under the innovation cluster synergy is proposed, the evaluation indicators are classified, and the hierarchical structure of knowledge transfer efficiency evaluation is constructed, as shown in Figure 1.

Figure 1: The Hierarchical Structure of Knowledge Transfer Efficiency Evaluation



2) Establish a two-two judgment matrix

Based on the knowledge transfer efficiency evaluation hierarchy, seven senior leaders of the backbone enterprises of Chongqing Electronic Industry Cluster, and three experts in the innovation cluster and knowledge management field are invited to compare the importance of the same level of evaluation indicators. The Delphi method is used to judge the relative importance of each index, and then the relative importance of the indicators is evaluated based on the 1-7 scale method. The judgment matrix of each level from high-order indicators to low-level indicators is as follows:

a layer - b layer (level one judgment matrix)

$$A=\begin{bmatrix} A & B_1 & B_2 & B_3 & B_4 \\ B_1 & 1 & 3 & 2 & 4 \\ B_2 & \frac{1}{3} & 1 & \frac{1}{2} & 2 \\ B_3 & \frac{1}{2} & \frac{1}{2} & 1 & 1 \\ B_4 & \frac{1}{4} & \frac{1}{2} & 1 & 1 \end{bmatrix}$$

Layer b - layer c (secondary judgment matrix)

$$B_1=\begin{bmatrix} B_1 & C_{11} & C_{12} & C_{13} & C_{14} & C_{15} & C_{16} \\ C_{11} & 1 & 1 & \frac{1}{2} & \frac{1}{2} & \frac{1}{3} & 2 \\ C_{12} & 1 & 1 & \frac{1}{2} & \frac{1}{3} & \frac{1}{2} & 3 \\ C_{13} & 2 & 2 & 1 & 2 & 2 & 5 \\ C_{14} & 2 & 3 & \frac{1}{2} & 1 & 2 & 4 \\ C_{15} & 3 & 2 & \frac{1}{4} & \frac{1}{2} & 1 & 6 \\ C_{16} & \frac{1}{2} & \frac{1}{3} & \frac{1}{5} & \frac{1}{4} & \frac{1}{6} & 1 \end{bmatrix}$$

$$B_2=\begin{bmatrix} B_2 & C_{21} & C_{22} & C_{23} & C_{24} \\ C_{21} & 1 & \frac{1}{2} & \frac{1}{4} & \frac{1}{2} \\ C_{22} & 2 & 1 & \frac{1}{3} & 3 \\ C_{23} & 4 & 3 & 1 & 4 \\ C_{24} & 2 & \frac{1}{3} & 4 & 1 \end{bmatrix}$$

$$B_3=\begin{bmatrix} B_3 & C_{41} & C_{42} & C_{43} & C_{44} & C_{45} \\ C_{41} & 1 & 2 & \frac{1}{3} & \frac{1}{2} & \frac{1}{2} \\ C_{42} & \frac{1}{2} & 1 & \frac{1}{4} & 2 & \frac{1}{2} \\ C_{43} & 3 & 4 & 1 & 2 & 2 \\ C_{44} & 2 & \frac{1}{2} & \frac{1}{2} & 1 & \frac{1}{2} \\ C_{45} & 2 & 2 & \frac{1}{2} & 2 & 1 \end{bmatrix}$$

$$B_4=\begin{bmatrix} B_4 & C_{41} & C_{42} & C_{43} \\ C_{41} & 1 & 2 & 1 \\ C_{42} & \frac{1}{2} & 1 & \frac{1}{2} \\ C_{43} & 1 & 2 & 1 \end{bmatrix}$$

3) Solving the judgment matrix by the summation method

Based on the ahp calculation method, the weight set of the first-level indicator can be obtained as:

Wu={0.470,0.172,0.219,0.139}。

Further, the secondary indicator weight set can be obtained as follows:

Wu$_1$={0.104,0.112,0.242,0.239,0.204,0.049}

Wu$_2$={0.100,0.248,0.531,0121}

Wu$_3$={0.125,0.118,0.387,0.135,0.235}

Wu$_4$={0.413,0.260,0.327}。

After verification, the above judgment matrix meets the consistency requirement, thereby ensuring the reliability of the weight vector result.

2 Applying the entropy weight method to determine the objective weight

1) Build the original datasheet

The electronic industry clusters with a similar situation in the other four provinces and cities and Chongqing's electronic industry clusters were selected and represented by A, B, C, and D, respectively. The researchers organized some field experts to set up an expert group. The expert group graded the evaluation index system proposed in this paper. The score range was 1-5. The higher the score was, the higher the development level of a particular innovation cluster on a certain indicator would be. Finally, the scores of the indicators of the various experts were combined. The obtained raw data are shown in Table 6.

Table 6: The Raw Data Table of Expert Group Scoring

			A		B		C		Ding
Evaluation on the effect of corporate culture construction *A*	***B*₁**	***C*₁₁**	3	3	3	3	2	3	3
		***C*₁₂**	3		3		3		2
		***C*₁₃**	5		4		4		3
		***C*₁₄**	4		3		4		4
		***C*₁₅**	5		4		5		4
		***C*₁₆**	2		2		3		2
	***B*₂**	***C*₂₁**	3	4	3	3	4	4	2
		***C*₂₂**	4		2		4		3
		***C*₂₃**	4		4		3		3
		***C*₂₄**	4		3		5		5
	***B*₃**	***C*₃₁**	3	4	2	4	3	5	4
		***C*₃₂**	3		4		4		3
		***C*₃₃**	3		3		4		3
		***C*₃₄**	3		3		2		4
		***C*₃₅**	4		3		5		3
	***B*₄**	***C*₄₁**	3	2	3	4	5	3	3
		***C*₄₂**	2		4		2		4
		***C*₄₃**	3		4		3		4

2) Determine the objective weight of the entropy weight method

According to the methods and steps given earlier, the objective weights of the primary evaluation indicators are first determined. Table 7 shows the primary data of the primary evaluation indicators.

Table 7: The Raw Data of First-Level Evaluation Index

	***B*₁**	***B*₂**	***B*₃**	***B*₄**
A	3	3	5	3
B	4	4	4	2
C	3	3	4	3
Ding	3	4	5	3

Since the scores in the expert score sheet are all dimensionless data, there is no need to perform dimensionless processing here.

Calculate the proportion p_{ij} of the j innovation cluster indicator, and obtain the weighting table P_{ij} as follows.

Table 8: The Proportion of the ith Innovation Cluster in the jth Index

	***B*₁**	***B*₂**	***B*₃**	***B*₄**
A	0.214	0.214	0.358	0.214
B	0.286	0.286	0.286	0.142
C	0.231	0.231	0.307	0.231
Ding	0.200	0.267	0.333	0.200

According to the formula given earlier, the entropy value, coefficient of variation, and objective weight of each evaluation index are obtained. The results are shown in Table 9.

Table 9: The Entropy, Coefficient of Variation, and Weight of Evaluation Index

	B_1	B_2	B_3	B_4
Entropy value	0.985	0.993	0.991	0.995
Coefficient of variation	0.015	0.007	0.009	0.005
Objective weight	0.417	0.194	0.250	0.139

From the above table, the objective weight w_u of the primary evaluation index = {0.417, 0.194, 0.250, 0.139}.

Further, the objective weights of the secondary evaluation indicators can be obtained as follows:

w_{u1}={0.394,0.081,0.212,0.252,0.061}
w_{u2}={0.241,0.057,0.231,0.161,0.069,0.241}
w_{u3}={0.049,0.138,0.317,0.317,0.114,0.065}
w_{u4}={0.259,0.309,0.061,0.272,0.099}

① → Calculating comprehensive weights using the ahp-entropy weight method

According to the method and steps given earlier, the comprehensive weight of the primary evaluation index is first calculated. According to the formula (15), a_u can be obtained:

$$a_u = W_u.w_u = \{0.470, 0.172, 0.219, 0.139\}.\{0.417, 0.194, 0.250, 0.139\}$$
$$= \{0.196, 0.033, 0.055, 0.019\}$$

Further weights from the formula (16), the combined weights of the primary indicators:

$$\overline{W}_u = \{0.646, 0.109, 0.180, 0.065\}$$

Repeat the above steps to get the comprehensive index weights of the secondary evaluation indicators:

$$\overline{W}_{u1} = \{0.110, 0.125, 0.280, 0.225, 0.198, 0.062\}$$
$$\overline{W}_{u2} = \{0.110, 0.236, 0.527, 0.127\}$$
$$\overline{W}_{u3} = \{0.139, 0.117, 0.368, 0.142, 0.234\}$$
$$\overline{W}_{u4} = \{0.436, 0.217, 0.337\}$$

5.2 Multi-level fuzzy comprehensive evaluation of knowledge transfer efficiency

Determine the innovation cluster knowledge transfer efficiency evaluation level

indicator set $U=(U_1,U_2,U_3,U_4)$, the second level indicator set $U_1=(U_{11},U_{12},U_{13},U_{14},U_{15},U_{16})$, $U_2=(U_{21},U_{22},U_{23},U_{24})$, $U_3=(U_{31},U_{32},U_{33},U_{34},U_{35})$, $U_4=(U_{41},U_{42},U_{43})$. The researchers set the evaluation set to v={excellent (4), good (3), qualified (2), unqualified (1)}, and invited seven senior leaders of the key enterprises of Chongqing Electronic Industry Cluster, and innovation. Other three experts in the cluster and knowledge management field also participated in the evaluation. Ten questionnaires were distributed and collected. All ten valid questionnaires were obtained for a statistical analysis. The evaluation results from ten experts are presented in Table 10.

Table 10: The Original Data Table of Judgment Matrix

index	Evaluation level			
	excellent	**good**	**qualified**	**Failed**
C_{11}	3	4	2	1
C_{12}	3	4	3	0
C_{13}	4	3	3	0
C_{14}	4	5	1	0
C_{15}	3	3	2	2
C_{16}	4	3	2	1
C_{21}	3	4	2	1
C_{22}	4	3	3	0
C_{23}	2	3	4	1
C_{24}	3	3	3	1
C_{31}	3	4	2	1
C_{32}	3	3	2	2
C_{33}	4	4	2	0
C_{34}	2	4	3	1
C_{35}	2	3	3	2
C_{41}	3	3	3	1
C_{42}	3	2	4	1
C_{43}	2	3	3	2

From the above table, the fuzzy judgment matrix of "the status quo of knowledge transfer efficiency" is:

$$M_{u1}=\begin{bmatrix} 3/10 & 4/10 & 2/10 & 1/10 \\ 3/10 & 4/10 & 3/10 & 0 \\ 4/10 & 3/10 & 3/10 & 0 \\ 4/10 & 5/10 & 1/10 & 0 \\ 3/10 & 3/10 & 2/10 & 2/10 \\ 4/10 & 3/10 & 2/10 & 1/10 \end{bmatrix}$$

The fuzzy relation vector R_{u1} is obtained by the first-level fuzzy comprehensive evaluation as follows:

$$R_{u1}=\overline{W}_{u1}\square M_{u1}$$

$$=\{0.110,0.125,0.280,0.225,0.198,0.062\}\square\begin{bmatrix} 3/10 & 4/10 & 2/10 & 1/10 \\ 3/10 & 4/10 & 3/10 & 0 \\ 4/10 & 3/10 & 3/10 & 0 \\ 4/10 & 5/10 & 1/10 & 0 \\ 3/10 & 3/10 & 2/10 & 2/10 \\ 4/10 & 3/10 & 2/10 & 1/10 \end{bmatrix}$$

$$=\{0.303,0.368,0.218,0.056\}$$

The same is available:

$$R_{u2}=\{0.271,0.311,0.342,0.087\}$$
$$R_{u3}=\{0.299,0.361,0.238,0.098\}$$
$$R_{u4}=\{0.263,0.275,0.318,0.133\}$$

From this, the membership matrix R_u of the second indicator can be obtained.

$$R_u=(R_{u1},R_{u2},R_{u3},R_{u4})=\begin{bmatrix} 0.303 & 0.368 & 0.218 & 0.056 \\ 0.271 & 0.311 & 0.342 & 0.087 \\ 0.299 & 0.361 & 0.238 & 0.098 \\ 0.263 & 0.275 & 0.318 & 0.133 \end{bmatrix}$$

Perform a two-level fuzzy comprehensive evaluation to determine the fuzzy comprehensive evaluation vector of the first-level target.

$$R = W_u \circ R_u = \{0.646, 0.109, 0.180, 0.065\} \circ \begin{bmatrix} 0.303 & 0.368 & 0.218 & 0.056 \\ 0.271 & 0.311 & 0.342 & 0.087 \\ 0.299 & 0.361 & 0.238 & 0.098 \\ 0.263 & 0.275 & 0.318 & 0.133 \end{bmatrix}$$

$$= \{0.297, 0.355, 0.242, 0.072\}$$

Finally, the total score for evaluating the knowledge transfer efficiency of Chongqing's electronic industry innovation cluster is:

$$S = R \circ V^T = \{0.296, 0.354, 0.241, 0.071\} \circ \{4, 3, 2, 1\}^T$$

$$\approx 2.91$$

It can be seen from the above results that the knowledge transfer efficiency level of Chongqing's electronic industry innovation cluster is good. It should be pointed out that the total score of knowledge transfer efficiency evaluation only reflects the knowledge transfer efficiency level of the Chongqing electronic industry innovation cluster as a whole, and it represents that the innovation cluster has reached a good level in all knowledge transfer efficiency indicators. Therefore, the innovation cluster should not only be satisfied with the score of knowledge transfer efficiency evaluation but the application of grade-by-level review and analysis of the knowledge of the two-level and with three indicators in the process of knowledge transfer efficiency evaluation. It should be noted that excellent experience can help form the system, strategy, and method of knowledge transfer. And reports on the existing problems and weak links should need verification prior to realization of the opportunity of the knowledge transfer efficiency measurement, and continuous upgrading of the innovation, knowledge management and competitiveness of the cluster.

6. Conclusion

Aiming at the problem of knowledge transfer efficiency evaluation under the synergy of innovation clusters, the researchers firstly constructed *the knowledge transfer evaluation index system* under the synergy of innovation clusters from the multi-dimensional perspectives of knowledge transfer subject, content, environment, and collaborative behavior, and secondly proposed the ahp-entropy weight method. An *objective and objective compound weighting method* is used to determine the weight of the knowledge transfer efficiency index. Based on the fuzzy comprehensive evaluation method, the accurate and effective evaluation of knowledge transfer efficiency was realized. Finally, the case study of Chongqing was used to verify the effectiveness of the evaluation system and the proposed method. It was expected the findings could help lay the foundation for decision-making for optimization and promotion of knowledge transfer under the synergy of innovation clusters.

7. Conflicts of Interest

The authors declare no conflict of interest in conducting this research.

The authors declare that no competing interests exist.

8.The Authors

The first author Xiaooduo Qian is working for the School of Economics and Business Administration, Chongqing University, Chongqing, China. The second author Xiaofen Liu is currently with the School of Economics and Management, Shihezi University, Shihezi, China. The third author is a lecturer in the BBA Program in International Creative Industry Entrepreneurship, Rattanakosin International College of Creative Entreprenurship, Rajamangala University of Technology Rattanakosin, Thailand. The three researcher-authors have a keen interest in the areas of creative management, evaluation matrices and indices, and synergy of innovative clusters.

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Integrated Marketing Communication Model of Elderly Care Business in Thailand

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Abstract

This research was to classify factors of the integrated marketing communication strategy model for the elderly care business in Thailand. The researcher constructed a questionnaire to collect data from 497 entrepreneurs of elderly care business in Thailand. The data were statistically analyzed by frequency distribution, percentage, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The obtained findings indicated that most of elderly care business in Thailand was registered as a sole proprietor business with a capital of less than three million baht. They aimed at health and convalescent care for the Thai elderly only. The average number of employees in the organization was 7.46 and the average business operations period was 8.32 years. The business location was in both Bangkok and provincial cities with similar population size. The result of the exploratory factor analysis performed on the obtained data indicated seven factors as 70.806% of variance calculated to form an integrated marketing communication strategy model for the elderly care business in Thailand. It should be noted that the model appeared to fit in the confirmatory factor analysis performed on the data and consistently contained seven factors from forty-four indicators.

Keyword: *Exploratory Factor Analysis, Confirmatory Factor Analysis, integrated marketing communication model, elderly health care business*

1. Introduction

The major changes in this modern era are development of information technology, and channel power, particularly the emergence of communication channels and distribution channels through the Internet. Increased competition in investment has arisen from borderless communication causing products and services of various brands in competition worldwide. The similarity of the brand or brand parity depends on marketing communication which has gradually developed into integrated marketing communication (IMC). Thailand is now entering a full-scale aging society as declared by Sontirat Sontijirawong, Deputy Minister of Commerce in 2020, for twenty percent or 14 million of the country's elderly population. The trend of the aging population can be seen in Japan, European countries, Scandinavian countries like Norway, Sweden, Denmark, and Nordic countries like Iceland and Finland. This trend has opened up a good opportunity for Thailand's service industry with emphasis on elderly care. As recognized by travelers and tourists, Thailand has its human resource with service mind. The country also

has a full range of good medical and health facilities to meet the needs of the local and foreign elderly for services in elderly health and convalescent care.

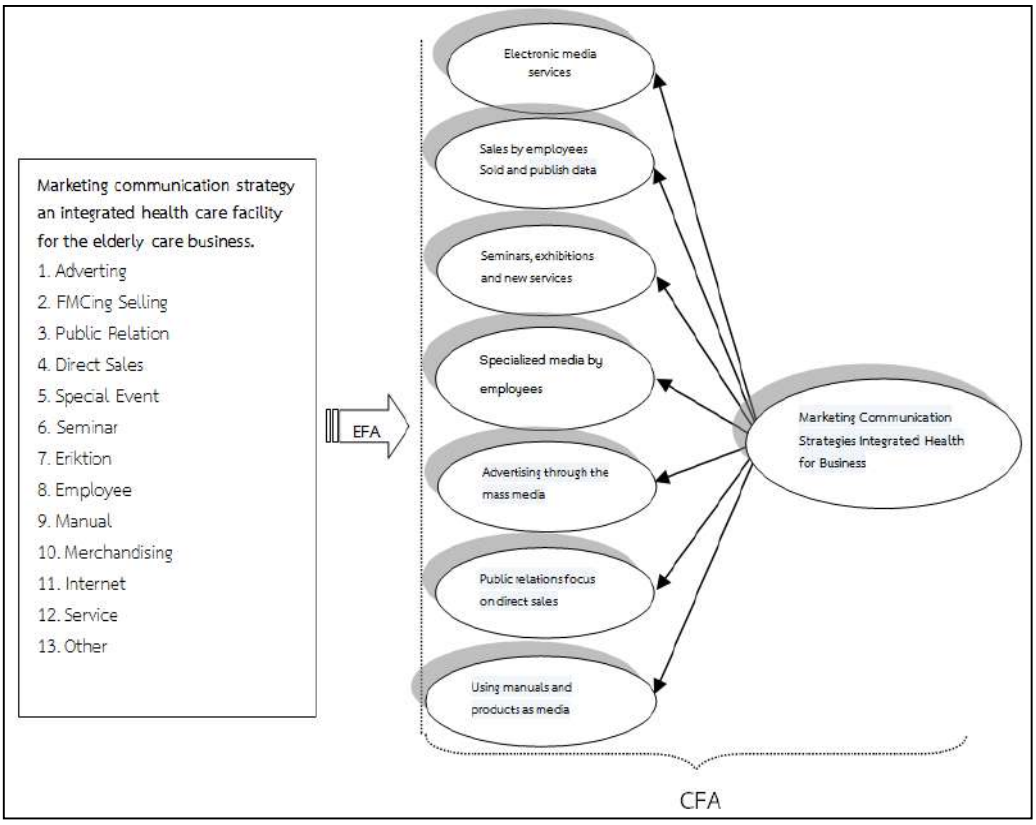
It is interesting to look at the current picture of Thailand's elderly care business. Service providers require in their personnel nursing knowledge, patience and understanding. As for technical knowledge in nursing, a nurse assistant is required to have 70-420 hours of the training program organized by the Department of Health, Ministry of Public Health or the authorized government or private agencies under supervision of the Ministry of Education. There has been a continued shortage of elderly care personnel in keeping up with the rising market demand for this type of personnel. The existing workforce tends to leave jobs after a rather short period of work for higher level jobs. The other two acute problems deal with some elderly care facilities not up to the operations standard, and responsibility of the service provider not up to the expectations of the elderly clientele. Moreover, there has been no clear-cut procedure on the deceased case of the elderly under care provided by the establishment involved.

As currently known, there have been no established standard criteria for elderly care facilities for the elderly care business to follow. The issue of disseminating information about elderly care services requires a clear guideline for comprehensive and diverse health promotion communication formats in advertising and direct marketing. Promotion and public relations of the marketing communication plan also incorporate various communication strategies to create communication that is continuous, clear, and coherently united. These are to help the family and relatives of the elderly clientele to use the provided services with confidence and trust in safety, standard facilities and care in accordance with health care regulations of the Ministry of Public Health. Considering the current practices of the elderly care business, the researcher was interested in identifying an integrated marketing communication strategy model for the elderly care business operations in Thailand. The researchers would like to classify and group appropriate components for factors in the integrated marketing communication model. It was expected that the obtained model can help guide effective planning, implementing and evaluating integrated marketing communication strategies for the country's health promotion as well.

2. Research Framework

The research conceptual framework for the study contained 13 marketing strategies to form 7 factors for the Integrated Marketing Communication Model. The framework is shown in Figure 1 below.

Figure 1: Research Conceptual Framework



3. Research Objectives:

This research was to classify factors of the integrated marketing communication strategy model for elderly health care business in Thailand. It was expected that the obtained findings would shed light on marketing strategies used in Thailand's growing elderly care business and current problems or obstacles involved in business operations.

4. Literature Review

This section reviews literature related to the study in four areas: (1) integrated marketing communication concept, (2) elderly care business, (3) elderly care business structure, and (4) success factor.

4.1. Integrated Marketing Communication Concept

The integrated marketing communication concept (IMC) has gained recognition and popularity among entrepreneurs, businesses and academics. The concept was studied in the work of Sirgy (1998), Schultz (2004), and Wongmontha (2009, 2012). It refers to the process of planning the use of marketing tools with target consumer groups with decision behaviors according to brands that stimulate purchase decisions. The integrated marketing communication concept concentrates on three things: (1) messages communicated with a psychological relationship

and physical continuity into pictures and slogans, (2) customers' characteristics and preferences, and (3) a variety of marketing tools, such as pricing, product format, promotion packaging style, and online communications.

As seen in its components, the concept is complex in communication, market share, positioning for positive and direct contacts with consumer groups. Such conceptual complexity of integrated marketing communication takes into account 18 principles: (1) advertising, (2) public relations, (3) direct marketing, (4) event marketing, (5) display, (6) licensing, (7) sales force, (8) transit media, (9) seminar, (10) packaging, (11) employees, (12)service, (13) exhibition, (14) manual, (15) training center, (16) exhibition, (17) demonstration center, and (18) showroom. These principles incorporate process, persuasive communication, consumer behavior, and and long run business operations (Sirgy, 1998; Schultz, 2004).

4.2. Elderly Care Business

The elderly care business refers to a service in a non-hospital setting. Residence services are provided with slight medical supervision. They generally cover overnight accommodation, food service, housekeeping, clothing, and physical hygiene. The business may closely monitor primary health care but does not provide nursing care. In case of illness, residents will be referred to the patient department of the nearby hospital for needed medical treatment (Online Manager, 2017)

4.3. Elderly Care Business Structure

The Foundation of Thai Gerontology Research and Development Institute reported the number of long-term elderly care businesses and healthcare facilities in Bangkok at the highest in 2016. It was forty-nine percent of the total of 800 locations across Thailand as of June 30, 2017 (Department of Business Development, 2017). It could be inferred that the elderly in Bangkok tended to resort to external care in the urban environment where their relatives needed to work outside the home and did not have time to care for. From the reported documents in 2016 and 2017, elderly care businesses in Thailand are generally divided into 6 types: (1) Day Care, (2) Long Stay Business for overnight stays, food service, cleaning, clothing and body care. This type usually includes follow-ups on primary health care, such as nursing home care, life support facility, long-term care facility in the hospital, nursing facility, and hospice care facility. (3) Elderly Residence for seniors aged 45 or over on the basis of the long-term lease of living units or rooms. The non-ownership lease typically covers a period of 30 years or living until the end of life. (4) Care Service by caregivers' visits at the elderly's home. (5) Charitable Elderly Home for the poor elderly without relatives. This type of business provides housing assistance and three meals per day. (6) Health Promotion Centers for the elderly provides health examination services and advice on promoting health care. If we look at the service factor, we can roughly classify the elderly care business into two categories; that is, (1) day-trip services (day care) for self-help elderly people with relatives, and (2) long-stay care services where the elderly live in service units for a specific period of time. If classified by the needs of the elderly, the elderly care business has two types for self-help and help-dependence in cases of chronic diseases or in intensive medicare

4.4. Success Factor

From the documents of Department of Business Development (2010, 2017) and Online Manager (2017), success in the elderly care businesses stemmed from seven factors as follows:

(1) *Business Strategies.* One of the prominent strategies that attracts the elderly and their relatives was the use of information technology, particularly the close-circuit camera for viewing the elderly' activities and for safety in monitoring the total living environment. Also important was special or custom-made care provided in the niche-market for the self-reliant elderly.

(2) *Location.* Most elderly and relatives preferred the selected elderly care facility in their home vicinity for convenience of visits. It was desirable for the business location to be close to the community areas, such as temples, parks, libraries so that the elderly would be able to join community activities. The location should not be close to sources of air, sight, smell or noise pollution and industrial sites.

(3) *Internal Environment and Physical Condition.* The elderly care facility should have appropriate internal environment with privacy. There should be an activity area, both inside and outside the building, which is physically safe and hygienically clean. Also needed are areas to promote social interaction with ample space for individuals and families to meet and doing joint activities within the residence.

(4) *Number of Skilled Personnel.* The number of nurses and caregivers must be appropriate for the condition and physical limitations of the elderly.

(5) *Management System.* Vitally important is confidence in the quality of services, particularly in having a written record of the elderly. There should be a mechanism from the management to ensure service quality and encourage participation for regular feedback from the internal personnel, the elderly and their relatives.

(6) *Service Charges.* Service charges should be reasonable for the services provided regarding quality, reliability and intensity of care.

5. Research Methodology

5.1 The Respondents

The researcher constructed a survey questionnaire to collect data from 497 entrepreneurs of elderly care business in Thailand. The respondents to the survey questionnaire were 800 comprising 169 business representatives (21.12%) and 631 (78.88%) individuals in the elderly care business. The number of respondents was determined by the sample size criterion for EFA and CFA using the Maximum Likelihood Estimation (MLE) as earlier used in the study by Phiriyakul (2010).

5.2 The Instrument

The instrument used in the study was a survey questionnaire to obtain data for an analysis of the components of an integrated marketing communication strategy for healthcare for elderly care businesses in Thailand. Exploratory Factor Analysis (EFA) and Confirmatory

Factor Analysis (CFA) were performed on the obtained data to identify factors of the integrated marketing communication strategy model for elderly health care business in Thailand.

The questionnaire was constructed in two parts. Part 1 was on *general information* to secure data on registration, number of employees, types of business, operating capital, caring services for the elderly, the number of operating years, and business location. Part 2 was on *integrated marketing communication strategies* of 44 items according to the specifications of integrated marketing communication strategies for the elderly care business in Thailand. These 44 items were under 7 components: (1) use of electronic media for providing services in 12 items, (2) sales by sales staff with information dissemination in 6 items, (3) new seminars, exhibitions and services in 5 items, (4) employee-based media in 7 items, (5) mass media advertising in 5 items, (6) public relations focusing on direct sales in 5 items, and (7) use of manual and product media in 4 items. These items were on the rating scale of 1-5 from 1 (minimum), 2 (low), 3 (moderate), 4 (very) and 5 (the most).

6. Data Analysis

Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were performed on the obtained data to identify factors of the integrated marketing communication strategy model for the elderly health care business in Thailand. The statistics used in the research was after Kelloway (1998), Silván (1999), Byrne (2001) and Wiratchai (2008), to examine the following:

6.1 Chi-square Statistic: χ^2
6.2 χ^2 / df
6.3 Goodness of Fit Index: GFI
6.4 Adjusted Goodness of Fit Index: AGFI
6.5 Comparative Fit Index: CFI
6.6 Tucker-Lewis Index: TLI
6.7 Parsimony Goodness of Fit Index: PGFI
6.8 Root Mean Square Error of Approximation: RMSEA
6.9 Root Mean Square Residual: RMR

7. Research Results

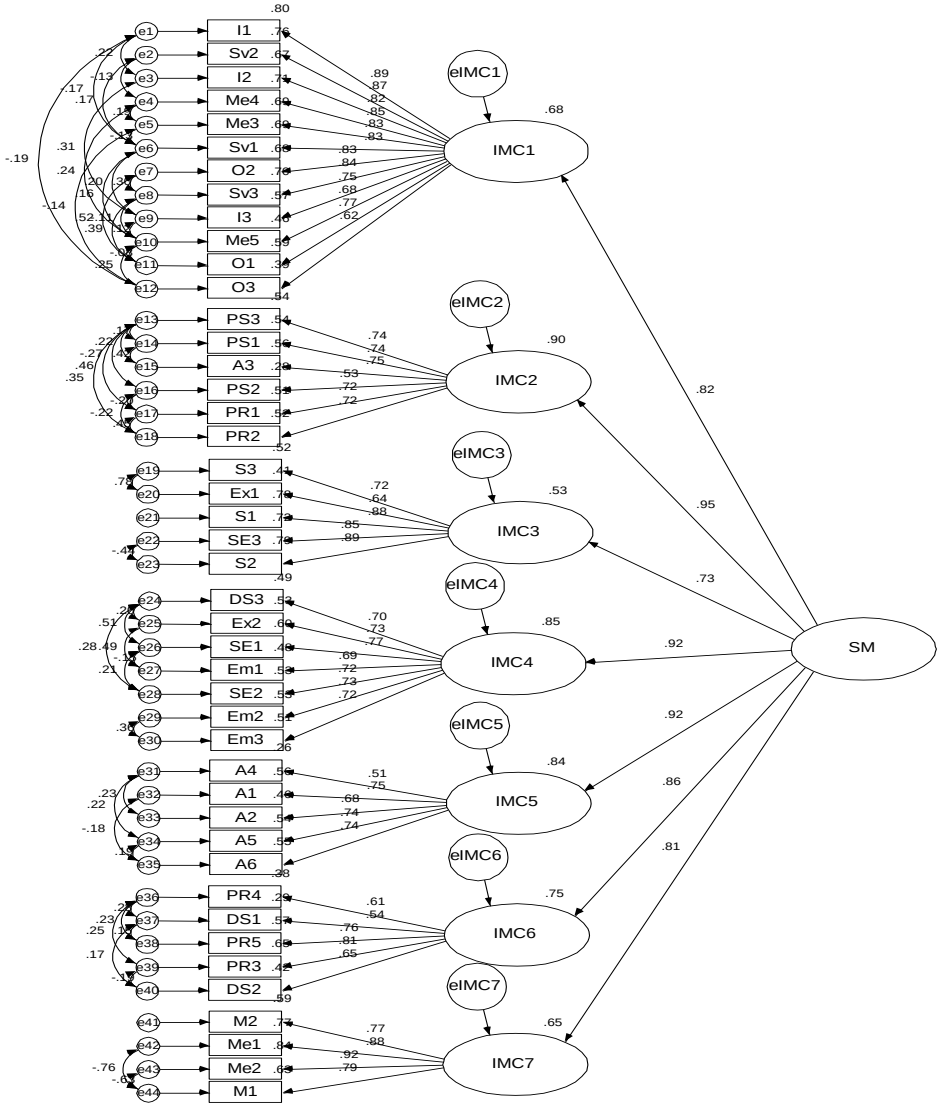
From the data obtained from 497 elderly care businesses in Thailand, 82.7% was registered as a sole proprietor business, and 56.5% had the operating capital less than 3 million baht. The business focused on taking care of the elderly including convalescent patients and 70.2% had 6-10 employees in the organization with an average of 7.46 persons. The period of business operations was 6-10 years (77.7%) with an average of 8.32 years. As for the location, it was in Bangkok (44.5%) and outer provinces (40.0%).

The component analysis revealed the Kaiser-Meyer-Olkin statistic at 0.963 and seven components explained the variability of variables used to measure the integrated health care marketing communication strategy for the elderly care businesses for 70.806%. Factor 1

"Use of electronic media for providing services and supplementing other media" explained the variance at 19.011%, Factor 2 "Sales by sales people with information dissemination" at 11.812%, Factor 3 “New seminars, exhibitions and services” at 9.123%, Factor 4 “Employee-based media at 8.846%, Factor 5 "Mass media advertising" at 8.103%, Factor 6 "Public relations focusing on direct sales" at 7.815%, and Factor 7 “Use of manual and product media” at 6.097%.

The analysis of the confirmed elements in CFA showed that a component model of an integrated marketing communication strategy for the elderly care business in Thailand was in congruence with the obtained empirical data, as shown by the chi-square statistical proportion / degree of freedom (χ^2 / df) at 2.973, which was less than the established criterion at 3. And when considering group indices defined at the level greater than or equal to 0.90, it was found that all indices, such as GFI = 0.975, AGFI = 0.937, CFI = 0.997, TLI = 0.985 satisfied the criterion; PGFI = 0.662 passed the level of greater than or equal to 0.50. The level was set as less than 0.05, index RMR = 0.046 and RMSEA = 0.047. For the characteristics of a pattern developed to confirm a suitable composition with a factor loading of 0.50 or more (absolute value) (Wongmontha, 2009), the results showed 7 elements or factors out of 44 indicators. They were (1) Factor 1 “Use of electronic media for providing services” with 12 indicators, (2) “Sales by sales staff with information dissemination” with 6 indicators, (3) “New seminars, exhibitions and services” with 5 indicators, (4) “Employee-based media” with 7 indicators, (5) “Mass media advertising” with 5 indicators, (6) “Public relations focusing on direct sales” with 5 indicators, and (7) “Use of manual and product media” with 4 indicators. These seven factors appeared to be incongruence with the empirical data obtained from the respondents in the study (see Figure 2 below).

Figure 2: The results of the analysis of the confirmation elements of the composition model of the integrated marketing communication strategy for the elderly care business in Thailand



8. Discussion

As seen in the reported results in Figure 2, most of the elderly care businesses in Thailand were registered as a sole proprietorship at 82.7%, and operating capital of less than 3 million baht at 56.5%; these were in line with reports from the Department of Business Development (2010, 2017) and Foundation of Thai Gerontology Research and Development Institute (2016). Commercial registration for setting up a care facility for the elderly is required by the Department of Business Development. Sole proprietorship of a small business is obliged to apply for commercial registration within 30 days from the commencement of the business operations; violation results in a fine not exceeding 2,000 baht with a continuous fine of not more than 100 baht per day until it is registered. A commercial registration fee for a sole proprietorship is 50 baht, a

partnership of not more than three partners for a fee of 1,000 baht, and a limited company for a fee of 200 baht. A fee for registered capital is 500 per 1,000 baht for the minimum 5, 000 baht to the maximum 250,000 baht. The elderly care facility focuses on taking care of the elderly, including convalescent patients. The average number of employees in the organization was 7.46, and the average business operations duration was 8.32 years.

The interview results revealed that the number of service personnel for the number of service users was in the ratio of 1: 2 (3). Generally, small businesses hold about 6-8 staff members to accommodate 12-20 users. The location in Bangkok was 44.5% and outer provinces 40%, as earlier mentioned in Online Manager (2017) and also in line with the Department of Business Development (2017). The Department especially noted that the number of elderly service businesses has steadily increased in Bangkok for more dependent elderly than those in the outer provinces.

The analysis of seven components explained the variability of variables used to measure the integrated marketing communication strategy for the elderly care businesses in Thailand at 70.806%. The variances of seven factors are: Factor 1 "Use of electronic media for providing services and supplementing other media" at 19.011%, Factor 2 "Sales by sales people with information dissemination" at 11.812%, Factor 3 “New seminars, exhibitions and services” at 9.123%, Factor 4 “Employee-based media at 8.846%, Factor 5 "Mass media advertising" at 8.103%, Factor 6 "Public relations focusing on direct sales" at 7.815%, and Factor 7 “Use of manual and product media” at 6.097%. The researcher noted that the most popular method used in this analysis is Principle Component Analysis: PCA by Varimax Rotation Factors which minimized the number of weighted variables on each component, yielding only variables with a high linear aggregation coefficient. The analysis results consider Eigenvalue greater than 1 to determine the common component. As seen, the first factor on *the use of electronic media for providing services and supplementing other media* is the most important component/ strategy because it can explain or extract the highest variance of the data, followed by other common components in a descending order.

The confirmation factor analysis revealed the identified elements were in congruence with the empirical data obtained from the respondents as shown by the chi-square statistical proportion / degree of freedom (χ^2 / df) at 2.973, which is less than 3 as the established criterion (Bollen, 1989). And the group indices defined at the level greater than or equal to 0.90 showed that all indices such as GFI = 0.975, AGFI = 0.937, CFI = 0.997, TLI = 0.985 satisfied the criterion after Byrne (2001), PGFI = 0.662 passed the higher level criterion (equal to 0.50) after Silván (1999). Those indices defined at levels less than 0.05 showed that the indices RMR = 0.046 and RMSEA = 0.047 passed the same criterion after Kelloway (1998).

The characteristics of a pattern developed to confirm a suitable composition with factor loading from 0.50 or more (absolute value) consisted of 7 components out of 44 indicators as reported earlier. The nature of this developed model is called Measurement Model--intended to explore and identify common elements that can explain the relationships between observed

variables. The parameter estimation using the Maximum Likelihood method was used in this analysis. Using a harmonization function that is not a line function, it is rather a function that can differentiate S and Σ if the two matrices are similar. The first term of the function is equal to the third term. The middle term is zero (Silván, 1999). This is to harmonize the model with the obtained empirical data, as shown in the results of the study reported in the earlier sections.

9. Recommendations

Based on the findings, the researcher would like to recommend the following integrated marketing communication strategies for the elderly care business in Thailand as follows:

(1) Elderly care business operators in Thailand can further develop the potential of personnel involved in disseminating information about the elderly care by creating an understanding in the people in the organization about its clear objectives and goals. The staff should be encouraged in the training area of creative thinking skills development and online marketing, as specified in Factor 1 on *the use of electronic media for providing services and supplementing other media*.

(2) Relevant government agencies should establish policies or measures to facilitate issuing licenses, certifying service quality standards, as well as supporting and strengthening the network of partners with hospitals, physical therapy units, and health promotion centers to reach new clients.

(3) Relevant government agencies should promote the training policy in knowledge, skills and code of ethics in the elderly care business. Confidence among service users can be assured with concrete safety measures and hygiene procedure with emphasis on professional care. It should also be a continuous communication to current and potential clients for their brand awareness toward service providers.

(4) The use of factor loadings of integrate marketing communication strategies can help service providers to select and prioritize urgent needs. This is to help formulate policies to strengthen the elderly care business sector in Thailand to operate efficiently with service quality at the international standard for the elderly clientele.

10. Further Research

The researcher would like to suggest further research into brand awareness and loyalty developed by service providers. It is vitally important to include marketing structure and customer demand in business planning and operations. This is for entrepreneurs or service providers to gain insight into the marketing structure of products and services, finance, marketing personnel, as well as online customer communication to adjust their business strategy direction toward a good success in the long-term business operations.

11. The Author

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Hotel Business Management in Support of Customers after Covid-19

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Abstract

This academic paper reports the strife of hotel business worldwide to improve the quality of their services for customers at time of intense competition within constraints in keeping operating costs as low as possible. Thai hotel operators have to prepare themselves to cope with digital technology to add value to their products and services guided by effective marketing strategies and activities. Besides, they need to face challenges from the Covid-19 crisis and its subsequent new normal of hygiene safety standards in the hotel industry in the country. The Thai Hotels Association reports the effects from the pandemic on 32,564 registered hotels or 1.63 million rooms available nationwide. Tourist behaviors have changed in adjustment to safety precautions to prevent Covid-19 infection, and so have their attitudes toward the safety standards of sanitation. More attention is on cleanliness of food and facilities in hotels. This paper reviews (1) *adjustments and potential* of hotel business in coping with Covid-19, (2) *problems or limitations* identified in research, (3) *handling Covid-19 limitations for* expected success, and (4) *experience transfer and awareness of adjustments* with new normal. It is expected that the issues of concern presented in this paper can shed light on a practical direction for hotel business operations in Thailand at the time of Covid-19 and beyond.

Keywords: *Hotel business operations, hygiene safety precautions, support for customers, Covid-19*

1. Introduction

It has been widely recognized that Covid-19 has a strong impact on the hotel industry, as each country has Covid-19 management measures for lockdown on areas to reduce the spread of the virus. In fact, without or limited travel in the tourism industry has imposed a severe effect on Thailand that relies on tourism for national revenue. Thailand in 2020 earned from tourism at 1.12 trillion baht, with a decrease of 1.89 trillion baht compared to the previous year which had income of 3.01 trillion baht. The number of foreign tourists traveling to Thailand in 2020 was expected to decline to 16 million, down from 39.8 million last year. As for the domestic market, Thai tourists in 2020 were predicted to be 60 million --a decrease from 167 million last year. The overall picture is that the country would lose 23.8 million foreign tourists and 107 million domestic tourists. This means a substantial loss of revenue from the tourism industry in Thailand (Tourism Authority of Thailand, 2020).

2. Hotel Business in Thailand

In the hotel business, important factors that must be taken into account for business operations are locations, distinctive and unique designs, full facilities, differentiated services from those of competitors, pricing and promotion, brand building, and hygiene considerations.

The management team is usually based on gross profit (GP) from sales revenue or cost of sales, but in some hotels the management's performance is measured by EBIT (Earnings Before Interest & Tax) or profit before interest and tax, which is after removing management expenses (selling and administrative expenses). The agreement between the owner and management on GP or EBIT is to include the cost of having to improve the hygiene system in line with the New Normal Trend. This is what the hotel owner has to handle the cost of sales or management expense (Selling and Administrative Expenses) and prevent conflicts in measuring management's performance now and in the future. In a listed company, the increased expenditure affects the dividend to be paid to its shareholders.

Therefore, it is necessary for a business owner to be careful about budgets and expenditure. The cost of rooms may need to be adjusted to include the cost of hygiene standards of weekly room sterilization, provision of alcohol sanitizing gel in the room, and upgraded room cleaning methods. It should be noted that hygiene precautions require meticulous check of linen, bed runner, and total beddings. Cleanliness check is extended to ventilation of the hotel’s overall environments.

It is possible to provide additional hygiene measures, such as social distance between reception and guests at 1.5-2 meters; this is applied to transportation seating, and other tourist indoor and outdoor activities. Guests may need more scattered locations. The social distance of 2-3 meters will give good confidence to customers.

The food and beverage department requires more space for meal stations and guest seating. Essentially, the department avoids arranging a large group of dining tables for service employees, provides gloves to the service staff to prevent direct contact with the utensils, containers and facilities of all kinds. It is important to monitor the service staff and guests with facial masks in the touch areas at the reception counter, washrooms, bars, service counters, buffet facilities, open kitchen, and food displays.

The housekeeping department requires a room sterilization schedule. The hotel's communal facilities are weekly or monthly sanitized to reassure hotel guests and staff for good protective from infection. Staff and guests use basic equipment, such as cleaning gloves, facial masks or face shields, disinfectant gels or body cleaners for their own hygiene safety.

The common areas of the hotel for guests are required to observe the safety precautions for guests, as follows:

Swimming Pool. In the case of a swimming pool, sunbeds are set at social distancing standards; storing, picking and disposing pool towels, and the staff’s use of gloves and facial are arranged to minimize physical contact.

Spa. The guest's temperature is measured prior to using the service, and physical readiness of the staff is observed regularly. Guests who are sick and have symptoms, such as frequent sneezing, or running nose are advised for a medical check.

Fitness. The enclosed space t needs strict monitoring, such as air-filter installation in the fitness center. The number of guests using fitness facilities is guided by the social distancing standards with the cleaning shift for at least every two hours.

Sales and Marketing. Sales and Marketing are to enhance their selling point with highlighted safety precautions as new normal instead of price reduction. It is clear that Covid -19 has made people aware of hygiene and social distancing. In the near future, hygiene safety will be a top priority for tourists.

The key to ensure customers' confidence in using hotel services is to post clear and rigorous security measures. This point was clearly stated at the World Economic Forum on May 4, 2020 that the hotel industry must learn from public health to build confidence in customers that hotels' accommodation and facilities are safe. Safety comes first and service has become a secondary concern.

The hotel industry needs to prepare for tourists as major stakeholders who tend to question the following:

(1) How do hotels or tourist attraction operators take care of their customers? Is there a refund or cancellation policy? How does Covid-19 affect their business?

(2) Can the hotel's measures really deal with the pandemic? Is it consistent with the government's or public health guidelines? And what measures does the hotel choose and why?

(3) Does the hotel train staff well in handling hygiene safety precautions? And how does the hotel change or adjust facilities and services?

(4) What external services are still available under new normal? What are the conditions of tourist attractions nearby?

3. Adjustments and Potential of Hotel Business in Coping with Covid-19

Small and large hoteliers need to adjust to reassure travelers, with a focus on hotel cleanliness regarding food and central facilities as well as strict preventive measures, especially when serving large tour groups and incoming tourist groups. Meetings, incentives, conferences and exhibitions (MICE) in the future need to attract high income tourists who travel in small groups to reduce the risk Covid-19 infection. Hotels may have to consider sharing income in other forms, such as providing health tourism services, food delivery services, and catering services in various places. New normal definitely causes consumer behavior to change drastically. As people become increasingly demanding for privacy, the sharing economy will suffer a precautionary hygiene measure like Airbnb in sharing accommodation among different parties or groups, which may not be able to provide housekeeping as hygiene standards used in hotels.

Consumers will seriously study the conditions before purchasing a trip package. Certainly, they will focus on hygiene precautions, such as availability of hand gel and seating arrangement of social distancing in eating areas and recreational facilities. Moreover, consumers will consider hygiene measures for all other external activities like sightseeing tours, travel visits and shopping.

Online booking, transactions and payments will be their major considerations at the time of Covid-19 as well. Here are examples of technological applications in action.

(1) Yanolja, a $ 10 billion online travel startup, reported that its self-service terminal since last November 2019 has been in demand more than double at the time of the Covid-19 pandemic. The Chief Executive Officer Jung Yoon Kim revealed to the media that the company is developing technology that will allow accommodation providers to easily accept check-in with just a QR code.

(2) Softbank Robotics Co., Ltd. and hotels in Tokyo serve as a field hospital for Covid -19 patients with mild symptoms. In addition to providing necessary services, they deliver food to the patients in their room. They program robots to interact and encourage patients.

(3) Hotels will consider other technologies, such as smart sterilizers or ultraviolet germ scanning technology for cleaning the room and a check-in system that can track guest contacts. In addition, facial recognition and AI technologies are expected to play a greater role in the hotel business.

(4) Hotels need to change fixed cost to variable cost by sending some workers into the sharing economy system and reducing the number of employees. Of course, the bond and the culture of the organization is the only important place to make such a hard decision on keeping the staff needed in the leanest way and send some to the sharing economy with other hotels. Hotels also consider reducing fixed cost by using part-time workers like housewives or workers from employment agencies.

(5) Hotels need to collect relevant data to optimize planning and use of its workforce. Current digital technology can help with distributing work for workers, collect various feedbacks from staff and customers, and make monthly reports on a real-time basis. This type of hotel management can easily monitor housekeepers or workers in cleaning or performing their assigned duties, and effectively keeping records on room/ facility maintenance.

(6) Hotels have to adjust their management model to accommodate domestic customers. Their check-in point has to observe hygiene precautions like temperature check, QR code scan in and out and availability of hand gel and disposal wiping tissue paper in the context of social distancing. Seating arrangements in the hotel lobby and waiting areas have to follow the guideline of hygiene safety precautions and public health guidelines of the country. Some hotels consider offering long-term stay during quarantine and also to new groups of potential customers with specific services on demand. Besides, hotels also consider organizing meeting points or setting landmarks for specific local groups of the shared interest—be it university students or members of local communities.

4. Problems or Limitations Identified in Research

From the research of Hall, Scott & Gössling (2020), the hospitality industry is slowly recovering from the Covid -19 crisis which will continue to exert profound impacts on how hospitality businesses operate. Hospitality businesses are expected to make substantial changes to their operations in the Covid-19 business environment in order to ensure employees'

and customers' health and safety, and enhance customers' willingness to patronize their business.

Such a point is consistent with the preliminary findings of a longitudinal study conducted by the editorial team of *the Journal of Hospitality Marketing & Management* pointing to reopening the sit-down restaurants and easing travel restrictions not being able to bring customers back immediately. A large portion of individuals (over 50%) are not willing to dine in at a restaurant immediately. The same is true for staying at hotels. Most customers (over 50%) are not willing to travel to a destination and stay at a hotel any time soon. Only around a quarter of the customers have already dined in a restaurant and only around one-third are willing to travel to a destination and stay at a hotel in the next few months. These findings suggest that customers in general still do not feel comfortable to dine in at a sit down restaurant, travel to a destination and stay at a hotel. The research findings also indicate that around a quarter of the customers will only feel comfortable to patronize a sit-down restaurant when their communities' ability to test, trace, and isolate Covid-19 cases is significantly improved. Around 18% of the customers will only feel comfortable to travel to a destination and stay at a hotel when that destination has very few Covid -19 cases and has the ability to test, trace, and isolate Covid -19 cases. Furthermore, there is a group of customers who will only feel comfortable to patronize a sit-down restaurant (around 14%) and travel to a destination and stay at a hotel (around 17%) when the Covid-19 vaccine becomes available.

In addition, Bartik et al (2020) studied the major impact of Covid-19 on public health to shed light on how the pandemic has been affecting small businesses. The researchers conducted a survey of 5,800 small businesses in four main themes: (1) mass layoffs and closures, (2) expense, (3) Covid-19 disruptions, and (4) funding. The results indicated that 43 percent of businesses are temporarily closed, and businesses have–on average–reduced their employee counts by 40 percent relative to January 2019. Secondly, many small businesses are financially fragile, as shown in the median business at more than US$10,000 in monthly expenses and less than one month of cash on hand. Thirdly, businesses have widely varied beliefs about the likely period of Covid-19-related disruptions. Fourthly, the majority of businesses planned to seek funding through the CARES Act. However, many anticipated problems dealt with accessing the aid through bureaucratic hassles and difficulties in verifying eligibility for financial assistance from the government.

5. Handling Covid-19 Limitations for Expected Success

It is interesting to see how hotel businesses can survive through Covid-19 disruptions. To overcome limitations caused by Covid-19 measures, some researchers recommended practical actions. Gursoy & Chi (2020) reported their preliminary findings that a large proportion of restaurant customers (64.71%) and the majority of hotel customers (70.42%) believe that the use of various technologies in service delivery will be necessary in the Covid-19 environment in order to minimize human-to-human contact. Some examples included service robots, online payment, and no-touch devices ranging from Apply pay or contactless bank cards, digital menus that can be viewed on personal mobile devices via QR codes, contactless digital payments, to keyless entry and no-touch elevators. The Singapore Tourism Board

(2020) revealed attempts to restrict arrivals and hotel reservations to reduce the potential of a second wave of infection by introducing a new third party to monitor cleaning standards to rebuild travelers' trust. Such attempts were consistently mentioned and also recommended by Kimberley of ABC, (2020).

6. Experience Transfer and Awareness of Adjustments with New Normal

It is noted that particular restrictions may have to be placed on *ecotourism* and travel to indigenous and other isolated communities who not only have very limited health resources to cope with any new outbreak but may also have had lower levels of community exposure to previous waves of the disease. Hall, Scott & Gössling (2020) pointed out that changes in tourism as a result of Covid-19 will be uneven in space and time. While some destinations will undoubtedly reconsider the nature of their tourism industry and focus more on local and more sustainable forms of tourism, without substantial institutional and governmental interventions, which are currently overwhelmed with saving lives and creating conditions to restart domestic economies and education systems for international tourism to continue. For many destinations and governments, especially those with authoritarian tendencies, the focus on tourism will be business-as-usual. Furthermore, the tourism sector needs to share and transfer experience among hotel business operators in building awareness of the staff and customers to hygiene safety measures and adjustments necessarily made under New Normal. This is for sustainability of success defined by growth in the number of external visitors and increased consumption of products and services driven from local travelers or tourists. The resilience of growth in international tourism and the capacity of tourism to rebound from the covid-19 crisis have long been expected in likelihood of the hospitality industry's recovery from Covid-19. The rebound will eventually arrive after at least in one year's time and the hotel business has to get prepared for the new normal standards with appropriately adjusted management.

7. Conclusion

In this paper, the author dealt with vital issues in hotel business operations regarding what the management has to go through for survival in time of the Covid-19 crisis. The current scenario of the hospitality industry was reported with concern for adjustments for hygiene safety precautions and measures. The author tried to point out that moderate success after the pandemic recovery would be possible with operations under new normal with lean management and staff in sharing economy. Specific issues should be under careful consideration for practicality, such as adjustments and potential of hotel business, identified problems or limitations, management of Covid-19 limitations, and experience transfer among hotel operators. These issues of concern are discussed to shed light on a practical direction for small and large hotel business operations in Thailand at the time of Covid-19 and beyond.

8. The Author

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Factors Affecting an Increase in Flights to Nakhon Phanom Province: A Gateway to Great Mekong Subregion (GMS)

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Abstract

The context of this study was Nakhon Phanom Province which has been identified as a gateway to Great Mekong Subregion (GMS) and the connecting point for Thailand, Lao PDR, Vietnam, and the Southern part of China by Highway R 12. Its location in the Northeastern part of Thailand with the border connected to Lao People's Democratic Republic (Lao PDR) is a vital logistic route for economic growth of the Great Mekong Subregion (GMS). This research aimed to study factors on travel behavior of visitors that affect an increase in flights to Nakhon Phanom Province. The researcher used both quantitative and qualitative research methods. The participants in the study were 400 travelers selected on a voluntary basis. The obtained data were analyzed for descriptive statistics and hypothesis testing in stepwise multiple regressions. Qualitative data from semi-structure interviews were concluded from a content analysis. The triangulation method was used to combine all data to give a comprehensive picture of the participants' responses in the study.

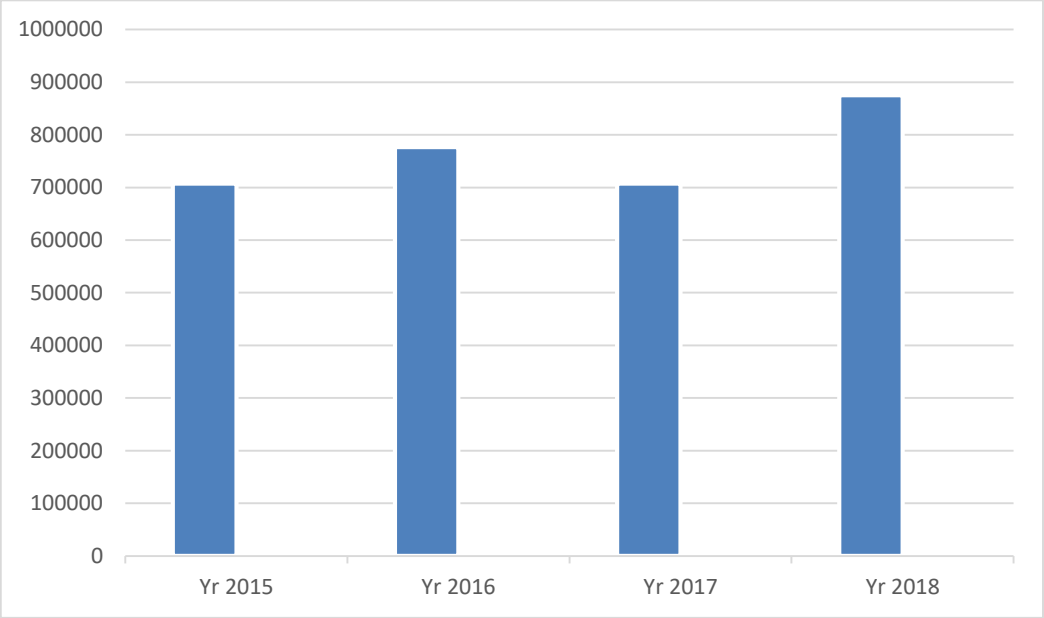
The *quantitative results* revealed that most of the participants traveled to Nakhon Phanom Province only one time (35.8%) for the reason of sightseeing (57%) in the length of stay for 2-3 days per trip (52.3%), between January and March (46.8%) as the high season. They bought air ticket online (41.8%), in particular, from Thai Air Asia Airline (84.3%). The marketing mix factors-- physical environment (Mean = 3.89), process (Mean = 3.83) and personnel (Mean = 3.80) affected the visitors. Air transport (Mean = 4.28), targeted special economic area (Mean = 4.27) and investment promotion (Mean = 4.26) affected the development of Nakhon Phanom Special Economic Zone. They also agreed moderately about more flights to Nakhon Phanom Province (Mean = 3.19). The *qualitative results* pointed to tourism as the main factor for an increase in flights to Nakhon Phanom as a cultural destination rather than a special economic zone.

Keywords: *An increase in flights, special economic zone, Highway R 12, Great Mekong Subregion*

1. Introduction

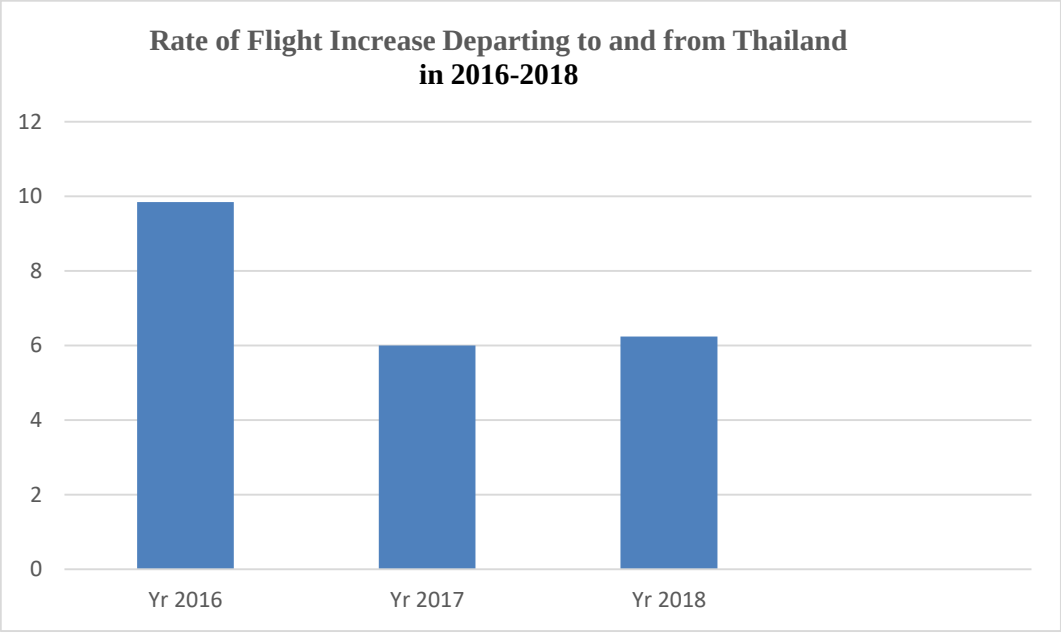
Aviation business in Thailand has been highly competitive as shown in the increasing number of flights departing to and from Thailand annually. As shown in Annual Report of Airport of Thailand Public (2019), the statistics at Suvarnabhumi Airport and Don Mueang International Airport indicated years and number of flights: 2015 = 707,362; 2016 = 776,992; 2017 = 707,362; 2018 = 874,999 (shown in Figure 1).

Figure 1: Number of Flights Departing to and from Thailand in 2015-2018
(Source: Annual Report of Airport of Thailand Plc., 2019)



The increasing trend of flights at Bangkok airports (Suvarnabhumi International Airport and Don Mueang International Airport) increased 9.84% in 2016, 6% in 2017 and 6.24% in 2018 (shown in Figure 2).

Figure 2: Rate of Flight Increase Departing to and from Thailand in 2016-2018



The effect from the increase of the flights could be seen in the increased number of tourists coming to Thailand from the ASEAN countries in 2017 at 9,322,508, in 2018 at 10,284,050, and in 2019 at 9,322,508—showing the growth from 10.31% down to 7.44%. Most tourists from the ASEAN countries traveled to Thailand continuously from Malaysia, Lao PDR, Singapore and Vietnam (Ministry of Tourism and Sports, 2019). The statistics reported land transport (53.10%) followed by air (44.10%) and by boat (2.10%) (Tourism Economic Review, 2015: 38).

2. Background of the Study

Nakhon Phanom Province is located in the Northeastern part of Thailand that has both a domestic airport and Highway R 12 connected to Lao PDR, Vietnam and the Southern part of China. This highway is the safest and shortest way to China to transport all kinds of fruits, goods and household products, with lower costs than by air transports to Thailand, Lao PDR and Vietnam (Panichsan, 2019). Nakhon Phanom Province has been positioned as one of the 10 provinces in the Special Economic Zone (SEZ) for Phase 2 to become a logistics center of the Southern part of China (Office of Nakorn Phanom Province, 2018). The Board of Investment BOI (2015) has targeted 13 industries and 61 business activities for Phase 2 of the Special Economic Zone (SEZ) as follows;

(1) Agro- industry, fisheries and related businesses
(2) Ceramic products manufacturing
(3) Textile, clothing, and leather manufacturing
(4) Furniture manufacturing
(5) Gems and jewelry manufacturing
(6) Medical devices manufacturing
(7) Automotive, machinery and parts manufacturing
(8) Electronics and electrical appliances manufacturing
(9) Plastics manufacturing
(10) Pharmaceuticals manufacturing
(11) Logistics businesses
(12) Industrial zones or industrial estates
(13) Businesses that support tourism

It was noted that Nakorn Phanom Province has been strategically located for highway transport that connects Thailand with Lao PDR, Vietnam, and the Southern part of China (R 12) and especially with the Third Thai–Lao Friendship Bridge built in 2001. The bridge has evidently improved the socioeconomic growth of both Thailand and Lao PDR. Meanwhile, the domestic airport in Nakhon Phanom Province has the capacity to serve up to 300,000 passengers per year. There are three flights a day by Low Cost Airline (LCA) named Thai Air Asia Airline that has replaced Nok Air since February of 2019. Nakorn Phanom Province has been well known as a tourist destination of historical heritage, arts, cultural festivals, and traditions of Buddhism, particularly Pra Thad Phanom Stupa and illuminated fire boat procession--locally called Lai Reua Fai. Since 2016, the fifteen-meter high sculpture of the Naga King Phaya Srisatta Nakarach of seven naga heads, with the overall weight of 9,000 kilograms has become a major tourist attraction. People came to pay respect and worship to the Naga King. It is interesting to investigate the need to

increase flights to Nakorn Phanom Province as a tourist destination in parallel with the government's promotion for its special economic zone in Phase 2 as a logistics center to the Southern part of China.

3. Objective

This research aimed to study factors on travel behavior of visitors that affect an increase in flights to Nakhon Phanom Province.

4. Research Methodology

The researcher used the quantitative and qualitative research methods. This section reports the participants and research instruments used in the study.

4.1 The Participants

The participants were 400, sampled by Krejcie and Morgan Table (Ritcharoon, P., 1997). Of 400 participants, 8 persons were key informants: 4 from the tourism sector and another 4 from the special economic zone in Phase 2 of Nakhon Phanom Province. The first person was selected purposefully and the rest by a snowball technique after Atkinson and Flint (2001). All participants were business owners in Nakhon Phanom Province, government officers from the Ministry of Tourism and Sports, the Customs Department, and the Local Administrative Office.

4.2 The Research Instruments

The researcher constructed a questionnaire of which the content validity was by Index of Objective Congruence (IOC) between 0.67-1.00; these values were higher than 0.50 which was designed to be appropriate for data collection after Tiraganon (1993). In addition to the questionnaire to collect *quantitative* data, the researcher also used a set of questions for semi-structured interviews to collect *qualitative* data on travel behavior of visitors from the participants.

5. Data Collection and Data Analysis

The researcher collected quantitative data by distributing the questionnaire to 400 participants, and qualitative data by interviewing 8 key informants as mentioned in Section 4.1. Descriptive statistics was used for frequency, percentage, mean and standard deviation. Inferential statistics was used to test the three hypotheses and Stepwise Multiple Regression Analysis to study relation between independent variables assumed as two predictors, and dependent variables by means of stepwise (Wanichabancha, 2003 : 352-403). Content analysis was used with qualitative data (Mayring, 2000) and the triangulation technique to identify similarities and differences in the answers provided by the participants (Carter et al., 2014). It was expected that the analyzed quantitative and qualitative data could yield findings responsive to the identified research objective.

6. Research Results

Since the study focused on factors on travel behavior of visitors that affect an increase in flights to Nakhon Phanom Province, the researcher reported the results in three aspects : (1) travel behavior of visitors who came to Nakhon Panom, (2) factors affecting their travel choice or travel motives by cultural or investment interest in the economic zone, and (3) factors

affecting an increase in flights to Nakhon Phanom Province—be it tourism or the economic zone.

6.1 Travel Behavior of Visitors to Nakhon Phanom Province

The researcher presented the participants' variables obtained from the questionnaire to illustrate the picture of the visitors' travel behavior. Most of the participants or airline passengers at Nakorn Phanom Province were female (54%). More than half were in the age range of 20-39 years (55%). They were business owners (31.3%) with a monthly income average between 10,001-30,000 baht (32.8%). More than half of these travelers were first-time visitors (35.8%) and enjoyed historic, art, cultural and traditional sightseeing (57.0%). Almost half visited Nakhon Phanom Province during January and March (46.8%), and more than half spent 2-3 days per trip (52.3%). As for air ticket purchasing, almost half used airline website (41.8%), and the majority selected Thai Air Asia Airline (84.3%).

6.2 Factors Affecting Travel Choice or Travel Motives for Nakhon Phanom Province

From the participants' responses, it was found that the visitors tended to rely on marketing mix factors for their cultural or industrial interest, which in turn affected an increase in the number of flights to Nakhon Phanom Province. The results were as follows;

(1) Most of the participants or airline passengers considered the marketing mix factors as determinants for their trips to see the sites of history, arts, culture and traditions in Nakhon Phanom Province at a high level (Mean=3.73). Other aspects were also rated high or moderately high: Physical Environment (Mean=3.89), Process (Mean=3.83), Personnel (Mean=3.80), Product (Mean =3.75), Place (Mean=3.66), Promotion (Mean =3.64), and Price (Mean=3.52).

(2) The participants or airline passengers felt positive about the special economic zone at the highest level (Mean=4.21). Other aspects were also rated high or moderately high: Air Transport (Mean=4.28), Targeted Special Economic Area (Mean=4.27) and Investment Promotion (Mean=4.26). These aspects or factors appeared to affect the development trend of the special economic zone in Nakhon Phanom, as suggested in their moderately high rating of the current increase in flights to Nakhon Phanom Province (Mean=3.19).

6.3 Factors Affecting an Increase in Flights to Nakhon Phanom Province

The researcher examined the participants' responses for a direct impact on the increased number of flights to Nakhon Phanom Province and found the following:

(1) Tourism appeared to play a major role in the participants' decision to visit Nakhon Phanom Province to see historic, art, cultural and traditional sites and activities. They evidently considered a marketing mix of Product, Price, Place, Promotion and Physical Environment. In particular, Personnel and Process had impact on an increase in flights to Nakorn Phanom Province, as hypothesized and tested with a positive result by the researcher.

(2) The special economic zone appeared to play a relatively minor role in attracting travelers to the Province, as perceived by the participants in the study. However, they

were in favor of the established special economic zone, the trade policy and promotion to connect Thailand and Khammouane District of Laos People's Democratic Republic with the third Thai-Laos Friendship Bridge in hope for economic effects trickled down to other adjacent provinces. The point on Nakorn Phanom Special Economic Zone as providing higher income for its population would help increase the number of flights to Nakhon Phanom Province was hypothesized and tested with a positive result by the researcher.

As seen in the results under 6.1-6.3, the researcher reported travel behavior of visitors to Nakhon Panom Province, factors affecting their travel choice, and (3) factors affecting an increase in flights to the Province. The participants responded to the interview questions regarding the three aspects in similar patterns; that is, the current attraction seemed to be on cultural or historical tourism rather than for investment in the special economic zone. Most of the airline passengers visited the Province for the cultural festivals, such as the annual celebration of Pra Thad Phanom Stupa and illuminated boat procession on the river (locally known as Lai Reua Fai). They came to respect King of Nagas (Serpents) Phaya Srisatta Nakarach much revered by both Thai and Laotian people. The third Thai-Laos Friendship Bridge has been used as the main linkage between people on both sides of Mekhong River. Laotian people have also used this pathway to go to Vientiane as a safe and fast route. In developing Phase 2 of Nakhon Phanom Special Economic Zone into as a logistics center, the participants informed that it had impact on only a few hotels and restaurants but not yet to the stage of stimulating local investors to invest in these businesses. Some more local residents have not yet been well-aware of the special economic zone in Phase 2. To the participants, tourism has currently become a prominent factor that attracts tourists and helps increase the number of flights to the Province.

7. Discussion

As for *travel behavior of visitors*, most of the travelers to Nakhon Phanom Province were women running their own businesses, as reported in the document of Thailand Statistics Office (2015) and the study by Deeprasert (2016). It was noted that more women than men by one percent in the last 10 years have been to this Province to update themselves with business opportunities that could attract investments in Phase 2 of the special economic zone. The Chairman of the Federation of Industries of Nakhon Phanom Province emphasized in the semi-structured interview with the researcher that people would gain benefits when they looked for good business opportunities to improve their living standards in the special economic zone.

The results of the study indicated clearly *factors affecting the visitors' travel choice or their travel motives* as currently stemming from cultural interest rather than the investment motive to do business in the economic zone. The travelers enjoyed annual celebration of Pra Thad Phanom Stupa and illuminated boat procession (locally known as Lai Reua Fai), as reported in the official document of National Statistics of Thailand (2018) that most of the visitors (80.60%) traveling to Thailand in the year of 2016 for 1-4 times per year and spending 2-3 days per trip. Nakhon Phanom Province has also been known for 7 stupas traditionally referred to as good auspices for seven birthdates for people in need of blessing. In addition, Nakhon Phanom Office of the Tourism Authority of Thailand has promotionally

extended cultural and historical tourism into the other two nearby provinces--Sakon Nakhon and Mukdahan under SANOK while including neighboring country tourism. The third Thai-Laos Friendship Bridge to Khammouane of Lao PDR enables people in these areas to visit medical centers for treatment or fly to Bangkok for quality services of hospitals, thus fitting in the long aspiration of Thailand to become a medical hub of ASEAN countries.

It was evident from the participants' responses and interview data that *factors affecting an increase in flights* to Nakhon Phanom tended to center on tourism rather than the special economic zone. The researcher received information from Torranin Nuanyai, the executive officer of Nakhon Phanom Province that inbound flights to Nakhon Phanom were at a full capacity with support from Sakhon Nakhon in one hour's drive. Tanus Kerdsombut, the officer in Business Development Department of Thai Air Asia however asserted that the increasing number of flights were related to the special economic zone policy, investment policy and purchasing power of people in the Province and its neighbors. He added that Thai Air Asia Airline from Sakhon Nakhon would be able to provide three flights a day, as stated in the Airport Cooperative Research Program (ACRP) Report 98 (2013: 13).

As mentioned earlier, Highway R 12 was important to Nakhon Phanom Province in connecting Thailand with Lao PDR through Thakhek, and with Vietnam through Hanoi and the Southern part of China. The highway saved about 823 kilometers as the shortest route to China. This was a good advantage in land transportation as pointed out earlier by Logistics Today (2019) that Highway R 12 linked well economy, trade, investment and tourism of Thailand, Lao PDR and Vietnam. Upon its completion of construction in 2021, Nakhon Phanom Province would become a center of logistics of Thailand and ASEAN countries as planned.

The findings of the study on travel behavior of visitors, factors affecting their travel choice or travel motives and those factors affecting an increase in flights to Nakhon Phanom were not beyond the researcher's expectation. Even though tourism was identified by the participants in the study as the current attraction perhaps moderately over the call of the special economic zone and its capacity as the logistics center in the Northeast Region of Thailand, the situation could change to both tourism and investment being positioned as two main attractions for the zone to benefit Thailand, Lao PDR, Vietnam and the Southern part of China. The Airport Cooperative Research Program (ACRP) Report 98 (2013: 12) emphasized improvement of airport infrastructure, accessibility, parking, safety, internet services and other facilities for shopping and hospitality products and services, for betterment of overall tourism and investment services.

8. Recommendations

Based on the findings of the study, the researcher would like to recommend in the following areas which should deserve attention in business developments as well as research for cost-effective business operations. They are the following:

(1) With the increased number of flights to Nakhon Phanom Province, Thai Air Asia Airline could consider cooperation with another local airline to cope with demands for quality services for airline passengers.

(2) Tourism activities in Nakhon Phanom Province should be in congruence with the provincial tourism policy that includes the Less Visited Areas Tourism Policy of the Tourism Authority of Thailand. As the major sponsor, Thai Air Asia Airline could play a vital role in hosting cultural and historical activities in support of Nakhon Phanom Tourism and neighboring provinces.

(3) Nakhon Phanom University could be the source of producing medical personnel to serve local people and those in nearby ASEAN countries. This would support medical tourism and medical education for ASEAN countries in a long term.

(4) Since Highway R 12 is the main connecting route for Nakhon Phanom Province and neighboring areas, the local government could consider more linking roads to facilitate land transportation and trading, especially starting with the local areas in the Northeast of the country to justify the position of Nakhon Phanom Province as a gateway to Great Mekong Subregion (GMS).

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Construction of Multi Media to Add Value to Nostalgic Tourism for Aging Clients

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Abstract

This research was to construct multimedia to add value to nostalgic tourism for aging clients. The researcher showed the constructed media in the form of a 6-minute nostalgic tourism video for the target group of tourists aged 50+ years at Don Wai Floating Market, Nakhon Pathom Province, Thailand. One hundred respondents were 45 males and 55 females, in the age range of 50-55 years = 35, 60-65 years = 42, and 70+ years = 23. The created nostalgic tourism video was of the Thai cultural identity on (1) language, costume and respect expression, (2) the local community in its historical past and Thai traditional lifestyle, and (3) local products as nostalgic souvenirs. The results of the study pointed to the aging tourists' positive perception toward the video contents and preference for nostalgic tourism that enhanced the value of the country's traditions and wisdom in cultural performances, activities, products and services.

Keywords: *Construction of multimedia, added value, nostalgic tourism, aging clients*

1. Introduction

The word "nostalgia" refers to the feeling of longing to the past. Nostalgic tourism satisfies tourists' need of "longing for the past" and "bringing back to the happy past experience." The trend of nostalgic tourism is currently becoming very popular with new attractions arising from the development of places with an interesting story in history, architecture, or way of life. Nostalgic tourism which has supported a culture of yearning for the past and revitalized old cities, especially via social media is conducive to spreading those impressive photographs. People in the online world can see each other quickly in the trend of merging the past with the present. It can be said that it is one type of sustainable tourism that enables parents and families to spend time together on vacation. The aging can bring the family members to revisit their golden places and enjoy the past experience together. As of now, there has been a steady increase in tourist attractions with nostalgic activities. One of the major concerns of the host communities or tourism business operators has its focus on how to disseminate information on nostalgic tourism regarding traditional performances, activities, products and services to the target groups. Considering issues in the nostalgic tourism trend, the researchers would like to propose the use of multimedia to add value to nostalgic tourism for aging clients.

2. Literature Review

This section will review literature related to nostalgic tourism in terms of justification of the study.

Demands for Nostalgic Tourism

As for demands for nostalgic tourism, Baker & Kennedy (1994) described the "past" as not only a sense of emotion sparked by experiences with the past. It refers to a feeling of remembrance or bitter sweet emotions that comes from the yearning for *experiences, products or services* of the past. People and society are yearning for or wanting to go back in time to experience the past for its charm and imagination. The past in various ways is inserted into the way of life of individuals and the cultural way of society. This creates a selling point to meet the needs of tourists who desire nostalgic experience by conveying the way of life of the past, the Thai identity, a local image, or history. Nostalgic tourism clients are demanding time-traveling attractions, personal satisfaction, and curiosity for their status in the order of the target society. For some people, it could be from the need to escape from the repetitive daily routines. In addition, tourists sometimes join the rare old local lifestyles that include traditional costumes, folk dances, traditional arts and crafts performances, or historical glory with museums, palaces, old churches, cathedrals, temples, and archeological sites. Light and sound events are usually part of historical glory enjoyed by tourists. The behavior of tourists who want to go back into the past has resulted in a new marketing strategy to meet the needs of target tourists.

Nostalgic Tourism and Retro Marketing

The cultural way of life in a society generally represents an attraction to visitors or tourists. In this light, marketers have created a selling point on the idea of yearning for the past of people in society. The concept of *retrospective marketing* has brought a new way of incorporating meaningful past recollections into the current lifestyle by creating linkage for consumers to relive the past, and it is important to connect it with what's causing happiness for consumers. The adoption of a new retrospective marketing mix focuses on popular and unique dimensions of the past as prototypes for production of goods and services. Such products and services are to convey the essence of what they represent with added value and emotional features for today's consumers. Goods or services of nostalgic tourism can reach consumers through advertising and marketing activities (Nantaporn et al., 2010; Zhao et al., 2014).

The concept of *retrospective marketing* or *time reversal marketing* draws a feeling or postmodern consumer behavior that craves for traditional lifestyles and the past story; it is applied to business planning to reach the consumer as much as possible. Nantaporn et al (2010) clearly explained that marketers use the method to bring popular products in the past to mimic the originals or combine them with modern technology. The products still retain the aura of the past reminiscing. Marketing segmentation strategies come in with the products reminiscent of the past by reusing old products or creating imitations. The aura of the product or service blends in the atmosphere, culture, and traditions, life.

A common nostalgic travel strategy tends to lie in the principles of marketing for nostalgic tourism. The result could be a marketing model that appeals to consumer emotions. Using memories of the atmosphere and objects of the past—be it lifestyle, fashion or culture, the marketer can connect with consumers to create a feeling of reliving their joys of childhood

or adolescent years. Interpolation of products with tourism services makes it possible for retrospective marketing to direct tourists persuasively to the trend of nostalgic tourism like the Western Concept that has attracted tourists to the pioneering lives of the early settlers and cowboys in North America. This concept was an award winner of the National Quality Award Office in 2015 by measuring customer-focus on satisfaction and loyalty, and marketing achievement. The components of sustainable tourism marketing achievement was assessed at three levels of customer loyalty: (1) Satisfaction with the brand component, (2) Feeling of satisfaction with the product, and (3) Determination to buy everything about the product.

Such a concept was further developed into the principles of *retro nova marketing* that describes a nostalgic travel strategy in three steps:

(1) *Build Linkage* to connect the present era with the past and encourage consumers to remember the old days they have happily experienced in the past. In addition, business operators of *retro-nova* first look at things that were very popular in the past with distinctive and unique characteristics to be used as models in creating the target products. For example, Yamaha Motor Company adopted the vespa scooter as a prototype for a Fino motorcycle. In the past, Vespa was very popular and featured with small and lightweight wheels. Yamaha then took all those characteristics of bright colors with rounded shapes of Vespa and put them into Fino as a big hit among consumers.

(2) *Build Value* to create value for consumers through research and development. It is important to identify the needs of today's consumers and use new technology for products in the past for current use. Retro-nova products are with functional and emotional benefits relevant to today's consumers.

(3) *Build Awareness* for consumers to recognize products or services that business operators have created. Retro nova marketing focuses on consumers' awareness of past experience to recognize products or services that capture the feeling of remembrance of the old days. To consumers, their long-gone experience has become a new experience by using the product connected with the past experience. As known, virtual representation of the recreated product or activity draws emotions and feelings upon re-experiencing past events or traditions (Nantaporn et al., 2010; Chen, Yeh, & Huan, 2014).

3. Research Objectives

This research was to construct multimedia to add value to nostalgic tourism for aging clients. It was expected that the responses from the senior tourists participating in the study could shed more light onto the value added aspects in multimedia for aging nostalgic tourism clients.

4. Research Methodology

This section reports the participants and the research instrument used in the study.

4.1 The Participants

The researchers solicited opinions from the target group of 100 voluntary tourists aged 50+ years at Don Wai Floating Market, Nakhon Pathom Province, Thailand. The respondents were 45 males and 55 females and 47 males, in the age range of 50 - 55 = 35, 60 – 65 = 42, and 70+ = 23. They were asked to give feedback about the created nostalgic tourism video contents

featuring the Thai cultural identity on (1) language, costume and respect expression, (2) the local community in its historical past and Thai traditional lifestyle, and (3) local products as nostalgic souvenirs.

4.2 Research Instrument

The researchers constructed multimedia in the form of a 6-minute nostalgic tourism video to obtain feedback from the target group of senior tourists aged 50+ years at Don Wai Floating Market, Nakhon Pathom Province, Thailand. The steps in constructing media in the form of a 6-minute nostalgic tourism video are shown below.

4.2.1 Step 1: Drafting

In drafting the multimedia contents, the researcher explored documentary search for issues on products and services in nostalgic tourism, such as past lifestyles and nostalgic travel itineraries regarding (1) uniqueness of the Thai identity in language, costume and respect expression, (2) characteristics of local community lifestyles shown in history, traditions, activities, play or beliefs, artistry and aesthetics of people in the community, and (3) representative products in the past based on Thai wisdom as souvenirs or OTOP (one-tambon- one-product) for tourists.

4.2.2 Step 2: Creating Nostalgic Travel Multimedia

The researchers created a video with the following specifications:

(1) the length of six minutes with characters wearing traditional costumes,

(2) games in the past, such as playing a circle called Ree-Ree-Khao-San, monk robing, clothing and activities like walking or cultural tours, sightseeing for temples with painted murals, and history telling of major incidents,

(3) eating and lifestyles of Thai people in the past, traditional menus, cooking methods, Thai dish ingredients, and prominent royal recipes,

(4) scenes on respect shown to the aging, politeness, and Thai smiles shown in connected images, displays, events and actions, and cultural activities—all reflecting trading and goods production in the community, kindness, and smiles to the members of the community and visitors, and

(5) selection of a representative nostalgic image for retrospective marketing.

The drafted version of the instrument was trialed in a pilot with 15 senior tourists who were not part of the participating group. The researchers used the obtained feedback for improvement and revision for the final version of the video.

5. Data Collection and Analysis

The researchers approached senior tourists on the site of Don Wai Floating Market and asked for their voluntary help in responding to the 6-minute nostalgic video on Don Wai Community. After viewing the video, they gave opinion on whether they felt positive, neutral or negative to the presented video as an attractive or effective means for retrospective marketing for senior tourists. The responses were noted and recorded with consent from the respondents. As for data analysis, the obtained data were counted for frequency and percentage. Suggestions or additional comments, if any, were also noted by the researchers.

6. Results of the Study

The results of the study are in two parts on the respondents' variables and their feedback to the presented 6-minute video on nostalgic tourism.

6. 1 The Respondents' Variables

One hundred respondents were 45 males and 55 females, in the age range of 50 - 55 years = 35, 60 - 65 years = 42, and 70+ years = 23. They were senior tourists at Don Wai Floating Market, Nakhon Pathom Province, Thailand. They were shown the created 6-minute nostalgic tourism video of the Thai cultural identity on (1) language, costume and respect expression, (2) the local community in its historical past and Thai traditional lifestyle, and (3) local products as nostalgic souvenirs. They were asked at the end of video viewing whether they felt positive, neutral or negative about the video in presenting the nostalgic past of Don Wai Community.

6. 2 The Respondents' Feedback to the Nostalgic Tourism Video

After viewing the 6-minute nostalgic tourism video of the Thai cultural identity as reported under 6.1, the respondents were asked by the researchers whether they felt positive, neutral or negative about the video in presenting the nostalgic past of Don Wai Community. Their feedback responses were noted and recorded with consent from the participating tourists. The researchers then summarized the results that pointed to the senior tourists' positive perception toward the video contents and preference for nostalgic tourism that enhanced the value of the country's traditions and wisdom in cultural performances, activities and products. Most respondents (more than 80%) liked the three aspects of the created video and complimented that it gave good and comprehensive picture of the attractive nostalgic past of Don Wai Community to current and potential tourists. This reaction was taken as a positive perception toward the nostalgic multimedia as attractive and effective tool for retrospective marketing for the aging clients

7. Discussion and Conclusion

As seen in the results of the study, the senior tourists liked media that convey the Thai identity in the past--an era without information technology to disseminate tourism information. They enjoyed uniqueness of the Thai language and costumes, history of the community, the way of life of Thai people in the past, traditions, and products or souvenirs reflecting Thai craftsmanship and wisdom. They said remembering the past made them want to go back to good old days. Senior clients' yearning for the past in nostalgic tourism was reported earlier in the work of Ononiwu (2013) who studied the role of music, media, song and spirituality in wellbeing in one's attempt to cope with aging life adjustments. Ononiwu examined the role of media, music, song and spirituality in wellbeing of aging people and determined their roles from an observational and testimonial data gathering perspectives. To the aging, media provide opportunities to do things together, gain information, tickle the brain and stimulate imaginative memories; music and song likewise give access to group exercises, relish fond memories, boost self-esteem and reinvigorate passions amidst a dwindling mental and bodily physiology. Spirituality is an aspect of wellbeing that is a well-established component of needs as enumerated by service users in voicing themselves on positive impacts and coping skills.

It is vitally important to use *research and development* in creating effective media for aging clients in nostalgic tourism. As shown in this study, the researchers initially assumed that senior tourists could be effectively attracted to nostalgic tourism in three aspects; that is, the Thai cultural identity on (1) language, costume and respect expression, (2) the local community in its historical past and Thai traditional lifestyle, and (3) local products as nostalgic souvenirs. The researchers then designed the media contents based on the identified

three aspects and asked senior tourists to respond their positivity, neutrality and negativity toward the target media after viewing. The result on positivity over 80% indicated clearly that business operators should take multimedia seriously as an attractive or effective means in communicating with senior consumers about nostalgic products and services. This communication channel appeared consistent with research findings reported by Chonody & Wang (2013) in connecting older adults to the community through multimedia. Chonody & Wang asserted that *an intergenerational reminiscence program* can be beneficial to older adults; however, benefits may not be exclusively related to reminiscing but to group process. They evaluated the program by using three sources of data: participants' stories, focus groups conducted with group members, and responses from social networking websites along with blog readers. Their findings showed that the participants benefited from the program by having a channel to tell their story and an activity that fulfilled their social needs. In addition, community members benefited from and learned about the participants in utilizing efficient modes of communication and media.

The significance of research and development to determine the channel of communication with senior tourists in nostalgic tourism was also discussed in the work of Chen, Yeh & Huan (2014). Their study dealt with nostalgia becoming a fashion in Taiwan in the past few years. "Nostalgic" restaurants are becoming common in Taiwan. A nostalgic restaurant can be a hot pot restaurant decorated with furnishings related to the origin or earlier use of the "hot pot" in Taiwan. The researchers of the study used SEM to test the hypotheses relating to nostalgia affecting consumption. The results indicated that (1) nostalgia has both direct and indirect impacts on consumption intention; (2) consumption affected by nostalgia varies depending on the individual; and (3) younger customers' predisposition for cheap prices is an important consideration in marketing nostalgia to younger customers. Another group of researchers Zhao et al (2014) also signified importance of research and development in nostalgic tourism in retrospective marketing. The researchers used different experimental priming procedures and advertising treatments across two studies to examine the moderating role of consumers affected by nostalgic and nonnostalgic advertising.

It can be seen that the findings of the present study indicated *consumers' positivity* toward the nostalgic tourism video as an affective state of the respondents who gave feedback to the researchers' data collection. This was consistent with Dryjanska (2015) who emphasized that aging inhabitants' memories can be a valuable source of information about the intangible aspects of cultural heritage of interest to tourists. Practical implications of the research project were obviously related to urban tourism and extended to nostalgic tourism as highlighted by Kim & Kim (2018). Undoubtedly, nostalgia and the development of *film tourism* products and activities play a crucial role not only in stimulating perceived familiarity with certain locations but also in motivating tourists to visit the locations and satisfying on-site experiences in the context of film tourism. Similarly, the role of nostalgia has, until now, not been fully theorized and integrated into related theories on *film tourism.* A good example can be seen in the role of nostalgia in the development of future *film tourism* products and activities in Hong Kong, particularly those that target Korean fans of Hong Kong films produced from the 1970s to the late 1990s. Sentimentality and stronger feelings of nostalgia attract tourists to the filming locations to experience even the fictional experience of those characters they have admired. Nostalgia therefore has now played an important role

in determining the new trend of nostalgic tourism. In light of the theory of social representations and cultural richness of Thailand for instance, it is not perhaps an exaggeration to say that this present research clearly projected the significance of research and development in determining the priority of the use of multimedia to communicate with senior clients in nostalgic tourism.

8. Suggestions for Future Research

Based on the results of the study, the researchers would like to suggest further research into creativity of multimedia used in retro marketing. Besides, it would be worth studying the demand forecast for nostalgic tourism in Thailand, as well as impacts of the family or sponsor on aging clients' choices of nostalgic locations both inbounds and outbounds.

9. The Authors

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The Path to Excellence in Thai Education

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Abstract

This academic paper is an adapted version of the address to educators at Chulalongkornrajavidyalaya University and the College of Education of Dhurakij Pundit University, Thailand in 2018. The author's purpose was to show the path to excellence in Thai education supported by the results from the analysis of skills needed for the changing education trends in the twenty-first century. The points under discussion included (1) desirable characteristics of learners, (2) seven new trends that affect the direction of society and the world, (3) skills for the twenty-first century in developed countries with personal/ social/ economic considerations, (4) the CCPR Model as applied to the teaching process, and (5) standards of excellence for leadership for quality education. The author closed the paper with seven proposed pillars for quality education implementation.

Keywords*: Excellence in education, Thai education, characteristics of learners, skills of the twenty-first century, the CCPR Model*

1. Introduction

Thai education has been through its struggle for quality in its process and target outcome since its first attempted establishment after the Second World War. As shown in the literature on Thai education developments, educators and layman authorities assigned to the Ministry of Education and the office of Higher Education Affairs (formerly known as the Office of Higher Education Commission OHEC, and currently as the Ministry of Higher Education, Science, Research and Innovation MHESI) have been continually upgrading Thai education at different levels in a series of models after the United Kingdom, the United States, Canada, Australia and Finland, but not with much success as planned by the National Development Plans for Education, Social and Economic Developments: The Second 15-Year National Education Development Plan 2008-2022; Higher Education Standards, 2015, 2018; Undergraduate Standards in the 4-Year Education Program, 2019; The National Policy and Plan for Digital Development for Economy and Society 2018-2037. Recently, the Ministry of Education and the Ministry of Higher Education, Science, Research and Innovation have focused on the development of learners for learner autonomy and self-learning, desirable characteristics responsive to demands for hard and soft skills of the twenty-first century, and the teaching process in congruence with Information Communication Technology ICT. Educators and researchers have been funded by the government units to conduct research on immediate education issues to yield answers in support of the new trend in education and beyond (The Ministry of Education, 2008, 2019; Office of Higher Education Commission, 2015, 2018; Office of the Prime Ministry, 2018).

2. Characteristics of Learners

In education management, classroom teachers and course instructors should pay attention to characteristics of learners. In this paper, the author considered characteristics of students to meet the demands of the ASEAN context. They are (1) Rational thinking, (2) Adapting ability to the environment, (3) Love of knowledge, (4) Ability to use modern technology, and (5) Have respect for oneself and others.

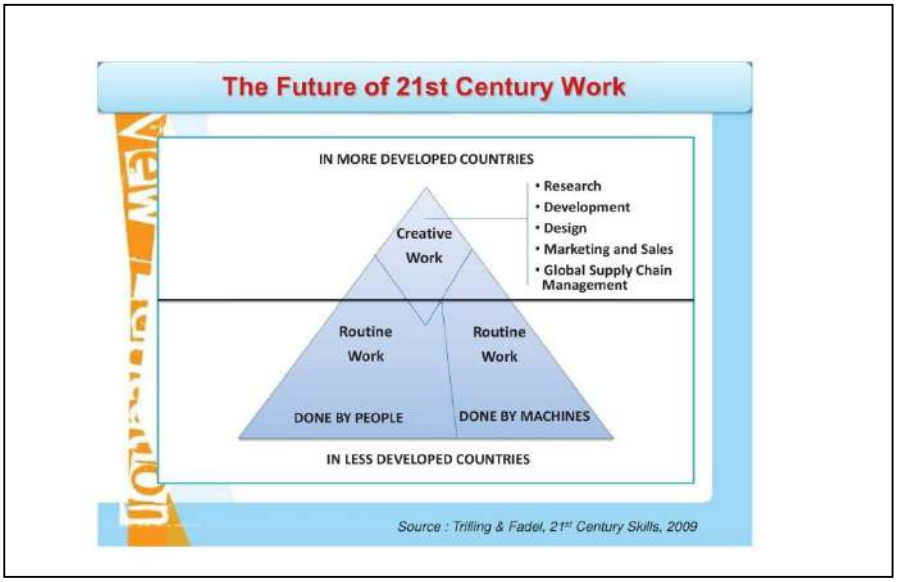
These characteristics are supposed to blend into five functions: (1) Adapt to social production and innovation, (2) Understand Thai culture, (3) Learn about culture of the neighboring countries, (4) Understand the world's problems, and (5) Make full use of world resources. It is worth noting that society and the world at large have imposed specific learner characteristics for success in the new social and economic arena. It is therefore vitally important for Thai students to know Thai society and understand the world society, and beware of their role in Thai society and the world society to become leaders in their respective communities.

3. Seven New Trends

In view of education management in the twenty-first century, the author looked at the future direction of society and the world. From the document analysis, the author identified seven trends: (1) Technologicalization, (2) Commercialization & Economy, (3) Globalization & Network, (4) Urbanization, (5) Digitalization, (6) Individualization, and (7) Environmentalization & Energy.

Technology serves as a driving force for change in trading systems for globalized networks. Globalization will lead to urbanization and a digital society in which people will be individuals in a tech-connected society. And they will face environmental problems especially of technological in nature. However, changes that occur will lead to the path of excellence, particularly in the area of education in Thailand in its attempt to cope with demands in educating or training the workforce for the twenty-first century. Figure 1 shows the future of 21st century work in more and less developed countries.

Figure 1: The Future 21st Century Work by Trilling & Fidel (2009)



We can see that the western world with more developed countries has its direction toward creative work which is a research-based task. In developing and designing creative work for sales in the global market, those less developed countries need to learn and adopt ideas, technologies from the western world for upgrading their products to be creative and innovative. This is how the 21st century skills come in and people need them to catch up with competition in terms of quality workforce and products.

4. Skills for the Twenty-First Century: A Case of Developed Countries

There are two main conceptual groups for the 21st century skills frequently reported and discussed in the literature of the 21st century. The first group on Partnership for 21st Century Skills contains Life Skills, Learning and Thinking Skills, as shown in Figures 2 and 3. The second group on ICT skills for learners is shown in Figure 4 and 5.

Figure 2: 21st Century Learning

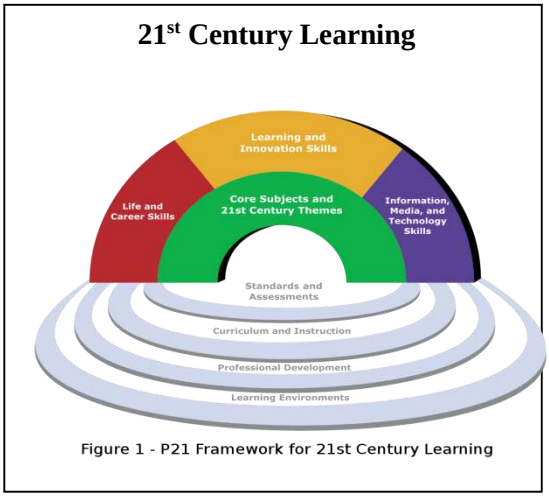


Figure 3: 21st Century Knowledge-and- Skills Rainbow

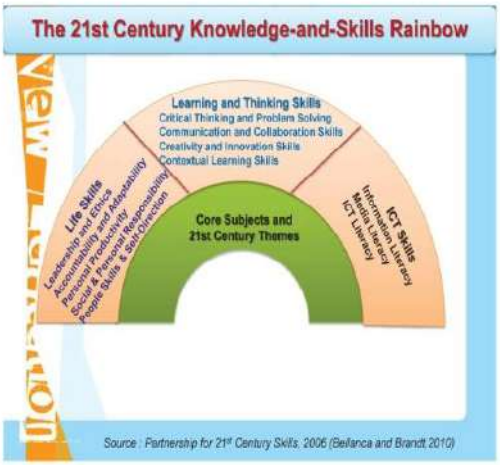
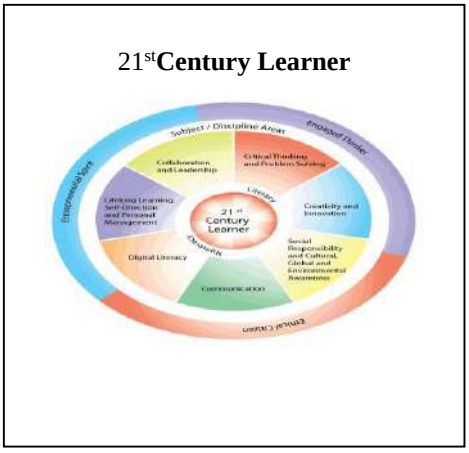


Figure 4: enGauge 21st Century Skills

Figure 5: 21st Century Learner



In addition to the two main groups, there are a wide variety of 21st century skills, such as those identified by OECD in 2005: a range of tooling skills, exchange information skills, relationship skills and professional work skills. Bellanca & Brandt (2010) reported a group of National Leadership Council for Liberal Education and American's Promise, specifying cognitive Intellectual and practice Skills, both personal and social skills, including other qualities like responsibility and ability for integrative learning (Association of American Colleges and Universities, 2007).

5. Specific Skills by Countries

Interestingly, most new skills for the 21st century are mainly identified by North American and European countries. Other countries like Singapore and Malaysia emphasize specific skills on their own: Singapore focuses on critical and inventive thinking, information and communication skills, civic literacy, and cross-cultural skills (see Figure 6); and Malaysia signifies lifelong learning, communication, leadership, teamwork, critical thinking and management skills (see Figure 7).

Figure 6: 21st Century Competencies and Desired Student Outcomes (Singapore MOE)

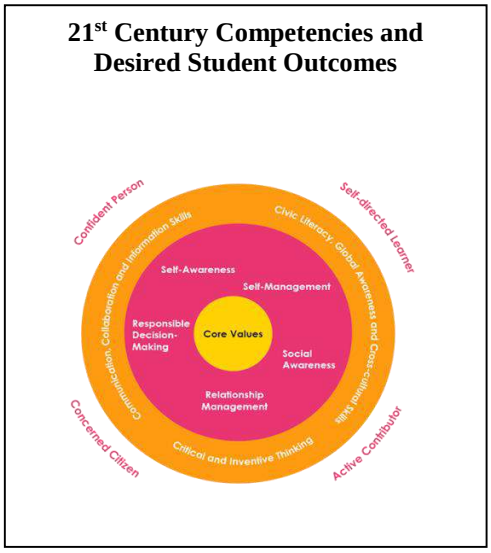
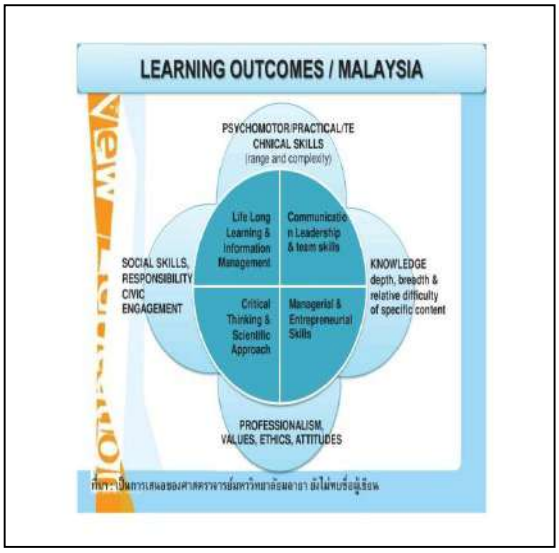


Figure 7: Learning Outcomes/ Malaysia Outcomes (Malaysia MOE)



6. Twenty-First Century Survival Skills

Professor Wagner of Harvard University identified in 2008 seven skills in the 21st century: (1) critical thinking, (2) collaboration, (3) adaptation, (4) initiative, (5) communication, (6) access to information and data analysis, and (7) inquisition, as shown in Figures 8 and 9.

Figure 8: Survival Skills

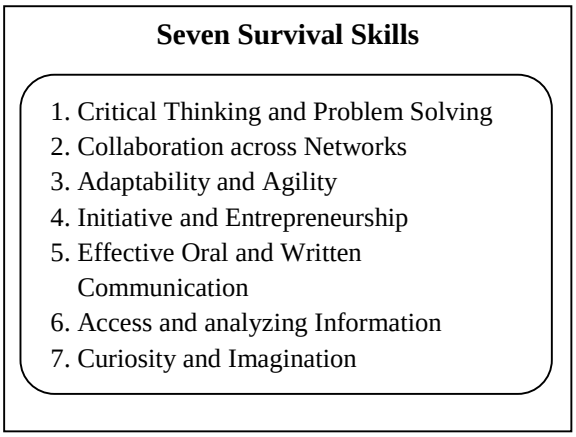
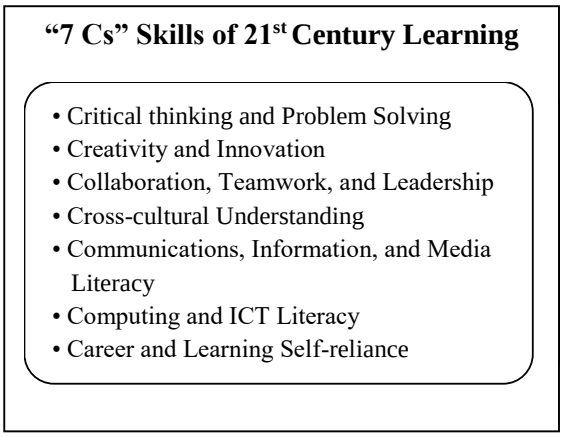


Figure 9: 7 Cs" Skills of 21st Century Learning



To the author, Trilling & Fadel (2009) summed up well 7 Cs to be easy to remember: Critical Thinking, Creativity, Collaboration, Cross-cultural, Communications, Computing and Career.

It is interesting to look at the 21st skills in the personal, industrial, and cultural perspectives as shown below.

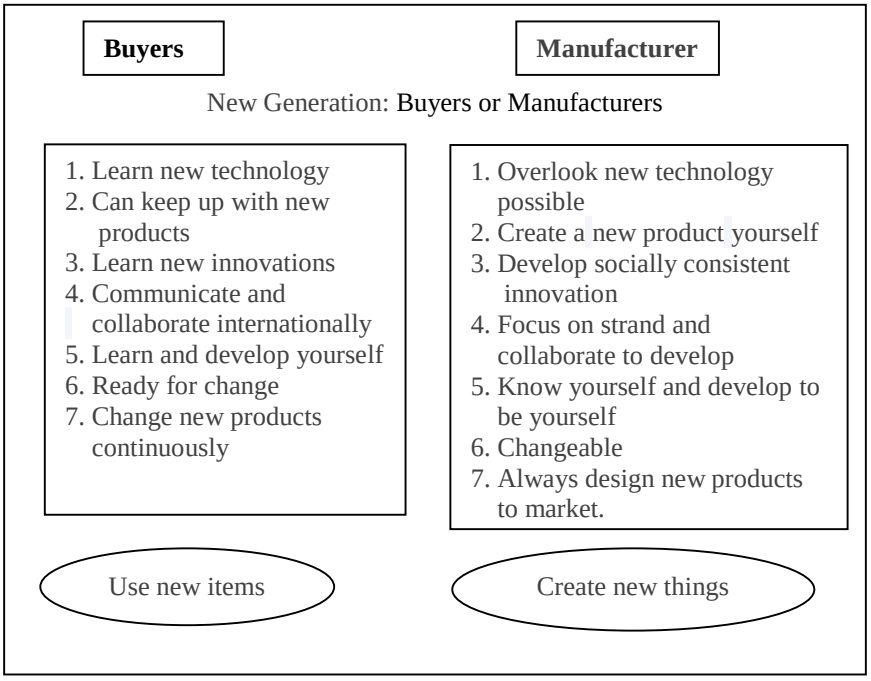
Personal

The identified 21st learning and skills are from the western world and they serve like products people *may personally wish to buy*, especially in working with new technologies in communication, trading and manufacturing. People need to develop skills to use new products or change them into new models by new technology.

Industrial

Learning and keeping up with the 21st century is considered a modern norm. This will allow us to learn and develop our skills to keep up with new products that change ways of work and life in the new business contexts in the new industrial age.

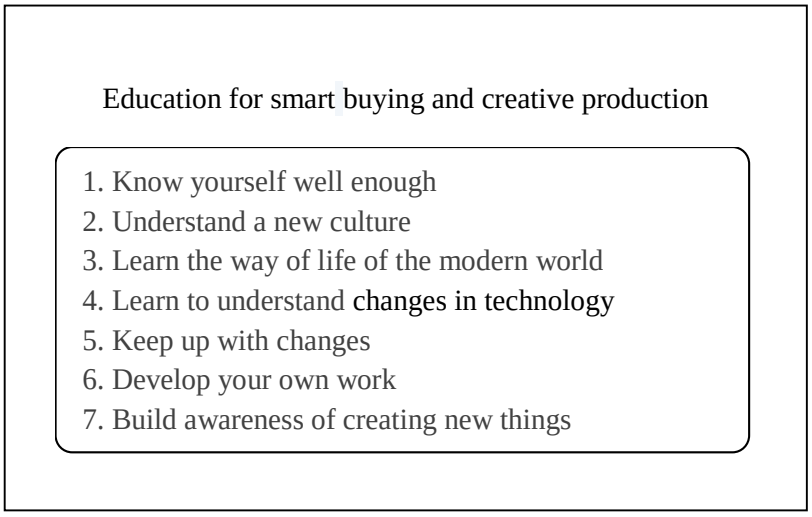
Figure 10: New Generation: Buyers or Manufacturers



That is why we should not just stick being a buyer, but we have to move on to being a smart buyer, and we need our learners to create their own new products, know themselves, make changes and design new products for the new market.

In a competitive society that constantly creates new quality products for the global market, it is imperative that we build our children or learners with quality and consciousness to develop Thai society to cope well with the world and new culture well, including learning to change and constantly strive to create new things for society. This can be done through education to make the young generation smart and productive buyers, as shown in Figure 11.

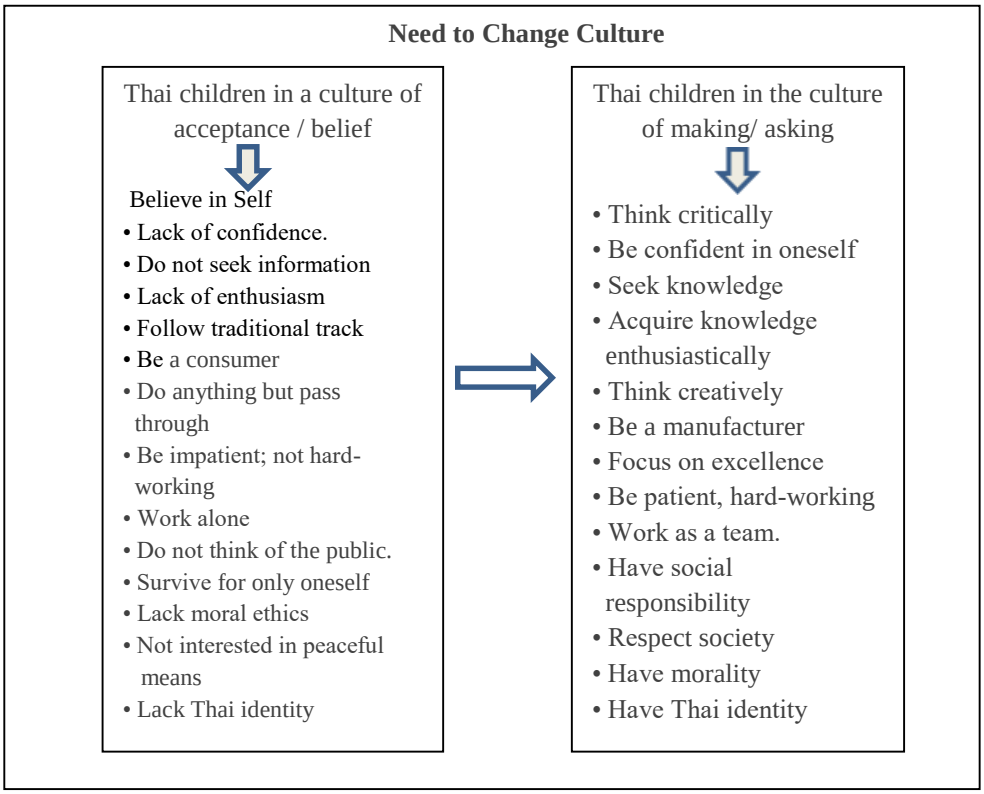
Figure 11: Education for Smart Buying and Creative Production



Cultural

In order for our learners to be smart with buying and creating new things, and keep up with changes, it is imperative that we change our own learner's culture, give practical values in a way that leads to new values and characteristics, especially thinking, production, and quality upgrading. The author considered changing culture for Thai learners as the new generation from being only a recipient / believer to be an innovator and questioner, as shown in Figure 12.

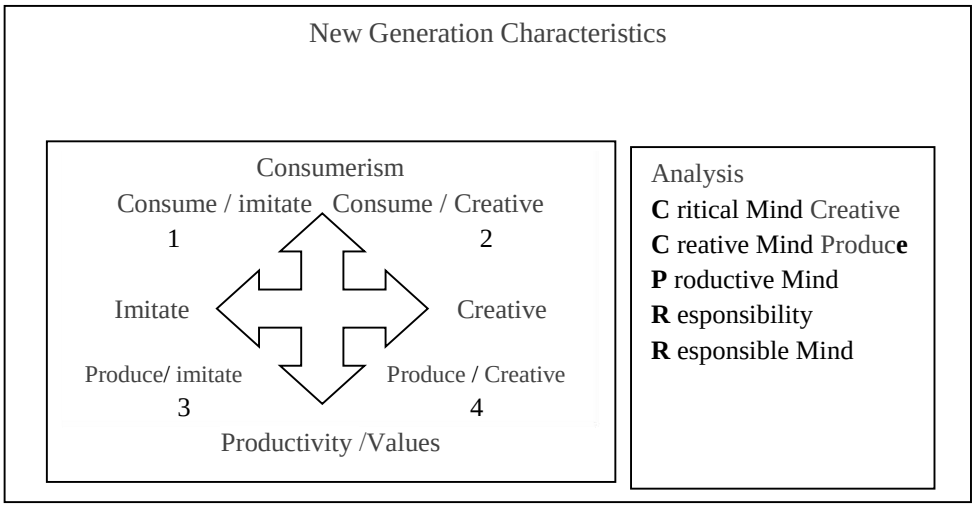
Figure 12: Need to Change Culture



7. New Generation Feature: CCPR Model

The researcher considered a new model called CCPR model with critical thinking, creative thinking, productive capacity, sense of responsibility, for development of children or learners in Thailand, as shown in Figure 13.

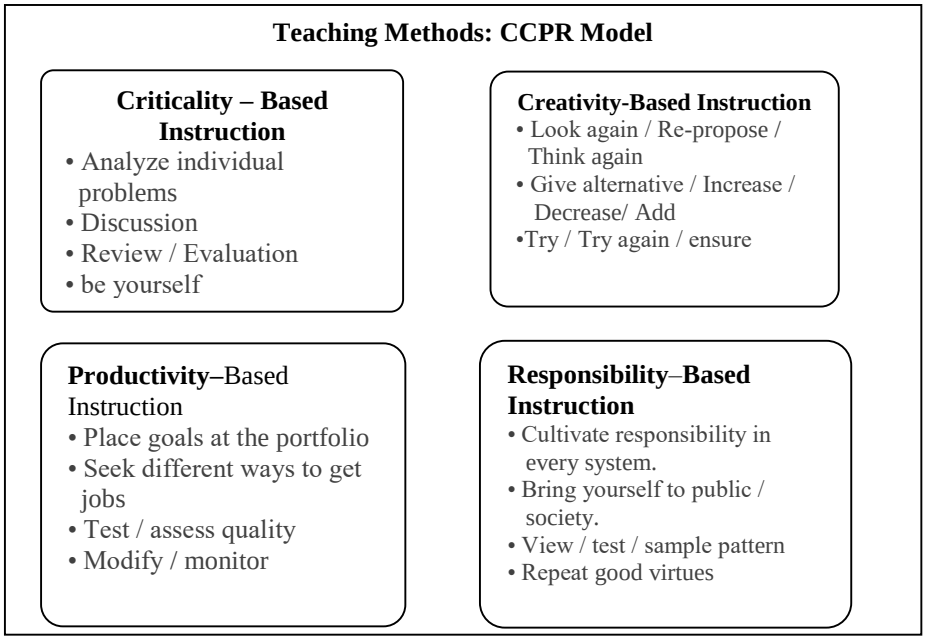
Figure 13: New Generation Characteristics



CCPR Model Teaching Process

To achieve CCPR qualifications, we need to teach learners how to innovate and think analytically. Practice in analytical thinking requires support for creativity to produce something new with training for responsibility development, as shown in Figure 14.

Figure 14: Teaching Methods: CCPR Model



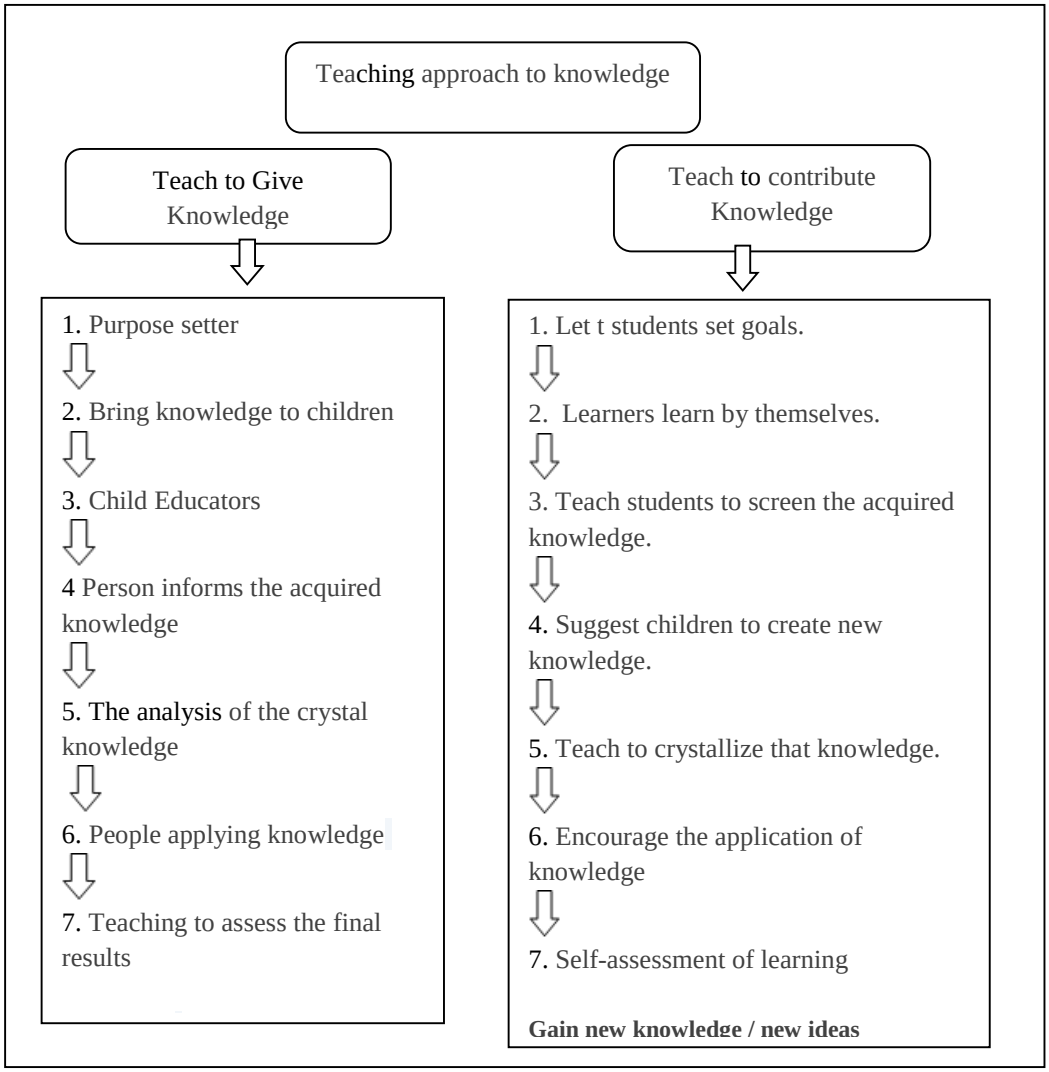
8. New Teacher Role: Teaching Approach to Knowledge

The new role imposed on teachers requires three new stages: (1) changing the old teaching role, (2) taking the new role, and (3) letting students talk.

1) Changing the old teaching role

Teachers are to leave their traditional teaching role in prescribing or spoon feeding knowledge to children or learners. They need to understand that the traditional method of imparting knowledge to learners will not be able to motivate or inspire learners to seek knowledge independently. Teachers are to provide support or assistance for learners by means of facilitating learning for the latter to explore in the areas of interest, partly as guided by the curriculum or the learning program.

Figure 15: Teaching Approach to Knowledge



2) Taking the new role

Teachers are to guide and encourage children to set own goals and find their own sources of knowledge. Children should be advised to choose and think for themselves,construct their own knowledge, clarify gained knowledge, use processed knowledge and evaluate the reconstructed knowledge in order to take practical and sensible action upon what has been learned, as shown in Figure 16.

Figure 16: Methodology: Learners

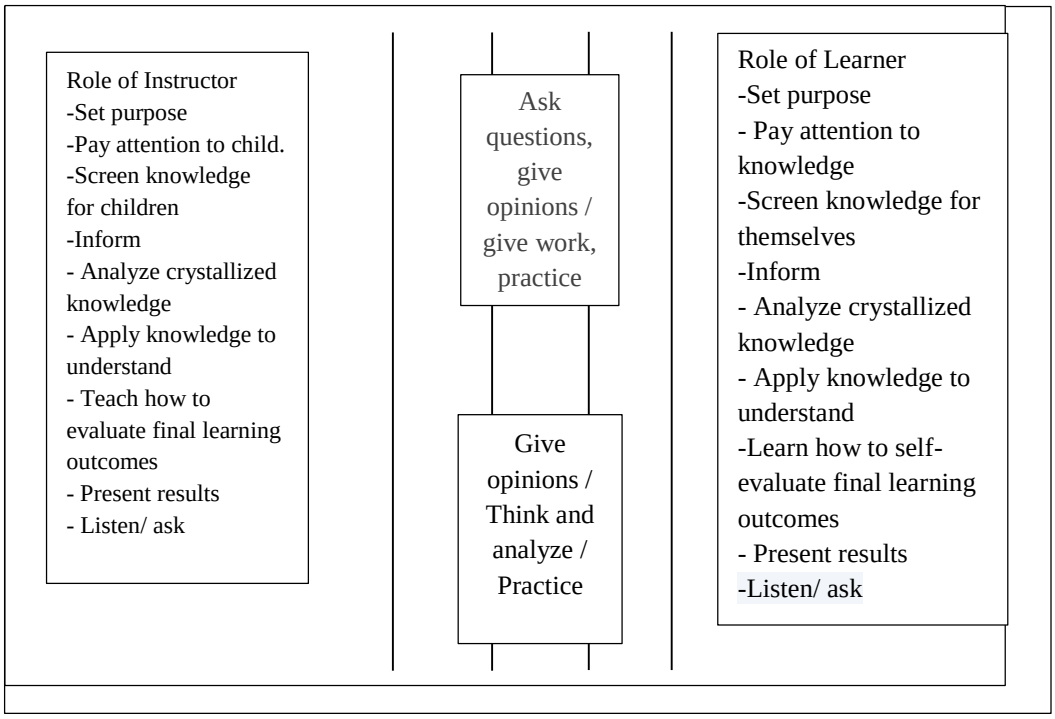
Methodology: Learners		
Process of teaching in a conducive way (Facilitator)	**Student role**	**Teacher role**
1. Set goals to get with learners	1. Set goals	1. Encourage learners to think about learning
2. To get planning in seeking knowledge and encouraging learners to educate themselves	2. Seek knowledge	2. Recommended knowledge sources for children to find knowledge
3. Sharing data screening	3. Select / knowledge	3. Encourage learners and coach

Methodology: Learners		
Process of teaching in a conducive way (Facilitator)	**Student role**	**Teacher role**
4. Additional things for students to create their own knowledge	4. Create new knowledge	4. Encourage students to construct experimental accounts of knowledge
5. Encourage learners to crystallize acquired knowledge	5. In conclusion, what I have learned or crystallized in knowledge	5. Encourage learners to impart knowledge, ask questions and evaluate
6. Teach students to apply knowledge	6. Apply knowledge	6. Emphasize use of knowledge and see the methods used to encourage learners to evaluate knowledge and practice
7. Encourage learners to assess acquired knowledge.	7. Assess acquired knowledge	7. Encourage students to assess the knowledge acquired or practice setting criteria

3) Letting students talk

In the whole learning process, teachers have to close their mouth (stop talking) to give time for learners to open their mouth or talk/ express themselves. Children should be supported to manage their learning, set goals and pursue their own learning for knowledge acquisition. Teachers need to learn new methods to assess students' learning outcomes. See Figure 17.

Figure 17: Role of Learner: Open Mouth of Student, Close Mouth of Teacher



As the overall picture, we need learners to be able to acquire knowledge and analyze knowledge by themselves. They should be empowered for knowledge analysis and self-assessment to make possible their sustainable learning in the long run. They are to become self-directed learners to meet with principles underlying the path to excellence in Thai education.

9. Standards of Excellence

The author would like to report standards of excellence by examples in this section.

1) Examples of Excellent People

The examples on new activities were shown in *one school project, one innovation per year* at Romchat Foundation of Chao Khun Thongchai, Wat Traimit College. This was to promote quality of education by having a number of best practice projects as good examples. There were nine examples of excellent teaching at preparatory schools for administrators to use as examples:

1. Knowledge of subjects taught
2. Professional teaching, self-learning
3. Teaching ability
4. Evaluation processes that can classify students
5. Considering differences among learners
6. Morality and ethics teaching
7. Ability to use technology
8. Collaboration, communication, human relations
9. Personality, physical and mental readiness

2) Excellent Innovation

The one-school-one-project scheme can yield innovation with a set of quality criteria as follows:

1. Academic Values: Thinking Process and Development, Outcomes and Impacts
2. Benefits of Innovation: Professional Importance and Application
3. Characteristics of Work: Outstanding Novelty
4. Collaborative contribution: diversity of stakeholders
5. Presentation: Techniques to present information and evidence

School administrators can take advantage of developing innovative operations by using the criteria shown above.

3) Excellent Teaching

The lessons from follow-ups, support and evaluation used in the project in promotion of innovation in Primary Learning of Romchat Foundation can be used for application in schools as follows:

1. Stakeholders: Important people, parents and participation in teaching and learning activities
2. Local wisdom: Local scholars and practitioners of knowledge or practice in the nearby community
3. Environment/ company/ community: Value of learning from close things and environment
4. Craft activities: Trust and belief in projects and activities
5. Booklet
6. Computer technology: Breaking through limitations
7. Learning power: Hidden in students.

Excellence is an important direction of quality in various dimensions of learners, teaching, management and environment, as shown in Table 1.

Table 1: Model of Excellence

Goals / dimension	**Learning**	**Thinking**	**Doing**	**Being Honest**
Learners	High achievements are capable of being complementary	Analytical, creative, intellectual solution	self-learning	Discipline, honesty, public mind.
Teach	have knowledge and methods of teaching	Have ability to think and teach thinking.	Analyze curriculum development, learning evaluation,	Kanlayanamit or camaraderie emphasizes good learners
Administrators,	academic leaders to promote good teaching	Encourages good thinking	Good teaching supplement	An enterprising role model
Environment	A community of learning and faith?	Has to promote thinking	Activities to promote thinking and collaboration.	Caring for people around

5) Excellent Organization

Excellence organization deals with organizational characteristics and the excellent school model as shown in the box under (1) below and Figure 18.

(1) Organizational Characteristics

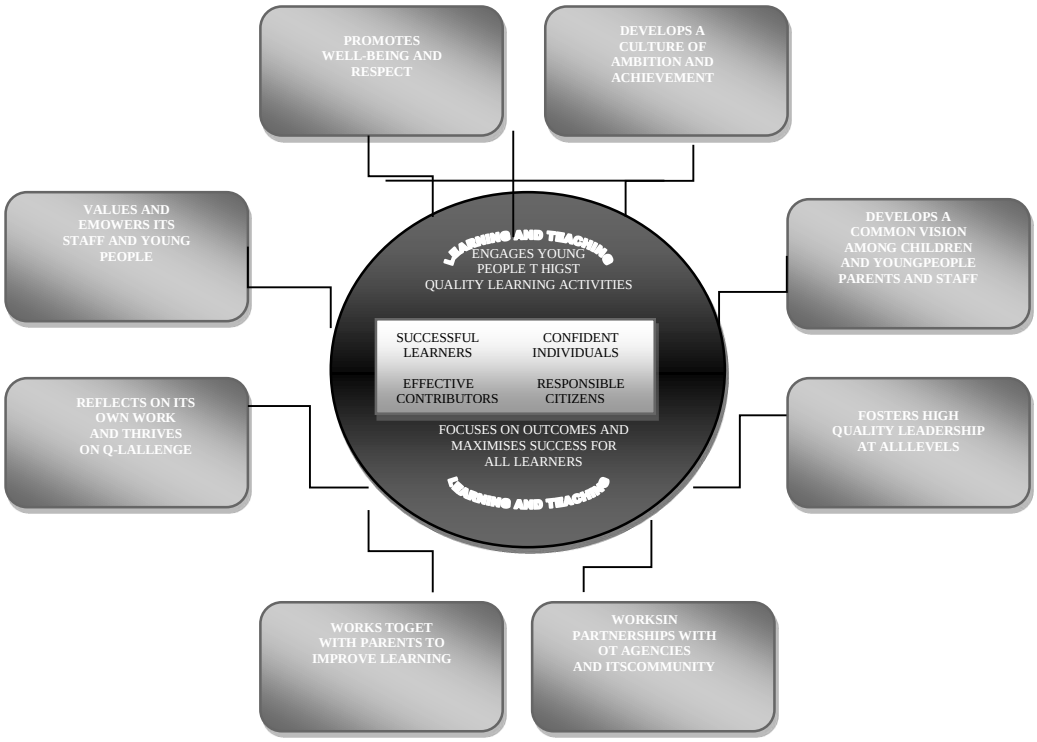
Pillar 1 Project Management
Pillar 2 Knowledge Management
Pillar 3 Process Management
Pillar 4 Change Management
Pillar 5 Human Management

It should be noted that organizational excelllence carries five concepts or pillars to be developed for efficiency of quality education implementation.

(2) Excellent School

The excellence school model is illustrated in Figure 18 below.

Figure 18: Excellent School



6) Process of Excellence

The process of excellence is in two patterns: (1) Pattern 1 in Participatory Style, and (2) Pattern 2 in Preparation for Change, as shown in Figures 19 and 20.

Figure 19: Pattern 1 of Process of Excellence in Participatory Style

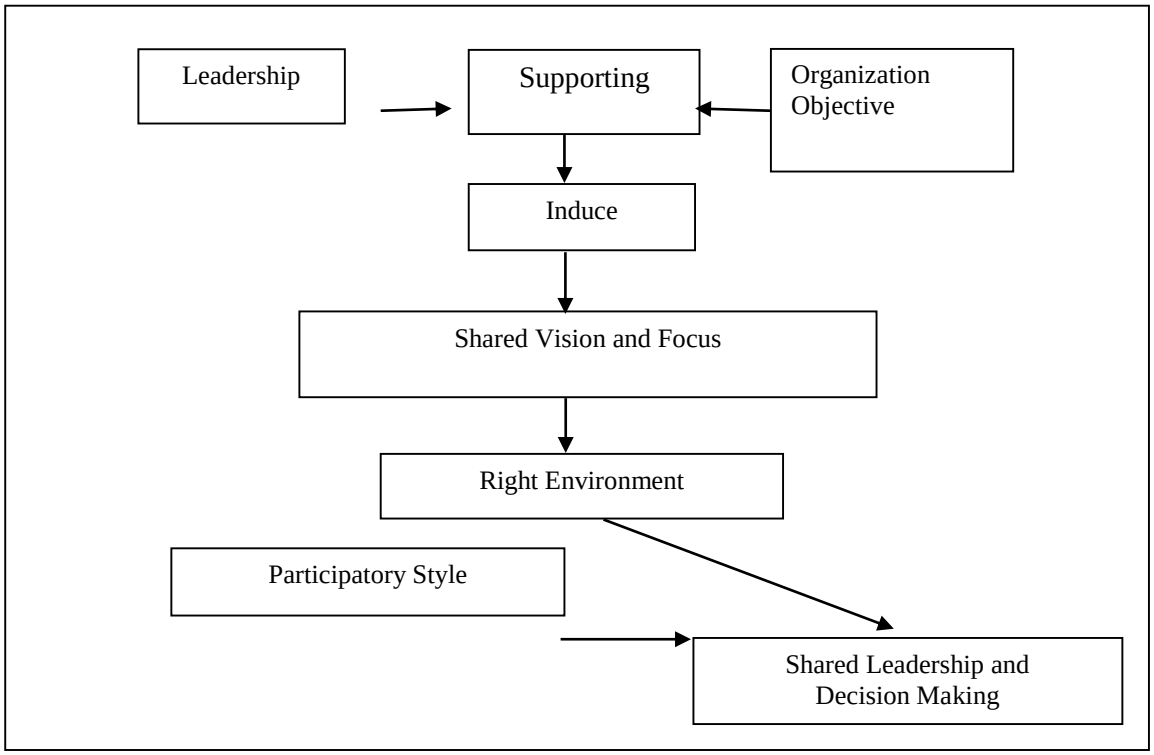


Figure 20: Pattern 2 of Process of Excellence in Preparation for Change

1. Leaders Correcting Vision and Mission
2. Leaders Motivating Employees
3. Effectively Communicating
4. Empowering Employees
5. Encouraging Teamwork
6. Preparing for Change

Source: Neuman, S. & *Its.* "Roles of Empowerment in Uplifting an Organization's Excellences in Less Development Countries (LDC)" Retrieved from the Internet, September 2019)

7) Leadership in Teaching Excellence

Leadership in teaching has seven main domains:

Domain I: Fostering a Collaborative Culture to Support Educator Development and Student Learning

Domain II: Accessing and Using Research to Improve Practice and Student Learning

Domain III: Promoting Professional Learning for Continuous Improvement

Domain IV: Facilitating Improvements in Instruction and Student Learning

Domain V: Promoting Use of Assessments and Data for School and District Improvement

Domain VI: Improving Outreach and Collaboration with Families and Community

Domain VII: Advocating for Student Learning and Profession

10. Strategies to Improve the Quality of Education

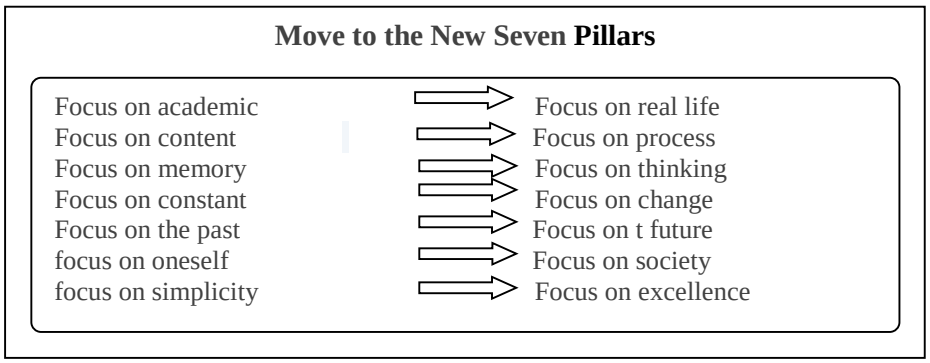
The author has put forward a synthesis of thoughts and understanding into seven strategies for intended excellence. Teachers need to motivate and encourage learner autonomy with a variety of learning-facilitation methods and alternative modes of classroom management. It is also important for teachers to collaborate with schools administrators for efficiency in quality education upgrading in four perspectives of *KIBA*: *K* for *Knowledge* in new management, up-to-date knowledge, and professional advancement; *I* stands for *Ideal* in having smart people to mobilize others to come up with work in action: *A* for *Action* to be taken for good results in education in the 21st century.

Summary of 7 strategies
Dreaming / Visioning
Inspiring / Encouraging
Best Practicing / Doing
Diversifying / Differentiating
Empowering / Developing
Coaching / Mentoring
Networking / Cooperating

11. Recommendation: Move to the New Seven Pillars

In this paper, the author analyzed and synthesized the highlights of the 21st century that have impacts on quality education and resulted in various models, strategies, pillars in guidance of adaptation for the ever changing contexts of education at all levels. The author has called attention to Thai educators and teachers to the application of seven pillars or in his own term in Thai as "Satasita" or seven stone tablets. He has cautioned teachers and school administrators to avoid actions that deviate from good practices that benefit learners, as shown in Figure 21.

Figure 21: Caution on a Step forward from Seven Pillars



To the author, it is high time for those authorities concerned in education administration to depart from the focus on content and rote memorization and then empower students with learning autonomy at all levels to assist and support them to go through the 21st century with confidence and needed abilities/ skills to contribute well to the society they belong.

12. The Author

The author Paitoon Sinlarat, Ph.D., is a renowned professor and educator in Thailand in the areas of educational administration and educational theory. He has been well-recognized for his project work on Thai graduates' desirable characteristics, contribution to Thailand Qualification Framework in Thai higher education, and supervision for curriculum standards of teaching certification under Kurusapa or the Teachers' Council of Thailand.

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Sharing Professional Viewpoints:
Direction of Business Administration Program

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1. Introduction

As known, the undergraduate program in Business Administration or BBA is one of the popular options to first-year university students for the reason that its discipline in social science related to business practically promises a good job in local and international business. The BBA program typically encompasses other business-related disciplines, such as accounting, finance, marketing, management of various branches, international trade, entrepreneurship and industry, and digital applications. In general, the program is designed to equip learners with both general and specific business concepts, skills and strategies to meet with demands in the job market. As of now, we can see a shift of the BBA program toward creative entrepreneurship and management, as well as integrates creative thinking by combination of various disciplines, such as the BBA program in Biomedical Science and Business Administration at Australian Catholic University (https://www.bachelorsportal.com), Music Business and Production Program at University of Kent in the United Kingdom (https://www.kent.ac.uk), Business Analytic Program at University of Miami in USA (Business Administrative Program, 2020), to name but a few. We can say that the innovation of business administration program has emerged in response to diverse business contexts.

2. Importance of Business Administration Program

Over the past fifty years, business educators have created and offered the Business Administration Program in many universities worldwide. Overaker (2020) asserted that studying business can develop crucial communication skills, ranging from writing a convincing report, drafting business documents in accounting and budgeting and email messages to presenting a winning pitch to customers, entrepreneurs, investors and project leaders. Beach (2020), Program Chair of the Bachelor of Arts Program in Business Administration for the Forbes School of Business and Technology® at Ashford University, stated that the skills needed in business administration come down to two types: business management and leadership. BBA students will gain critical thinking and leadership skills needed for comparison and contrast of different business environments, financial information analysis for decision-making, planning for strategic business, and other key business-related abilities. Likewise, the Business Administration Program is currently created to teach learners to have a comprehensive understanding of the business world and function effectively in business transaction tasks.

3. RICE Business Administration Program

This section shows an example of the BBA program toward creative entrepreneurship and management, as well as integration of creative thinking into a combination of various disciplines. It is the Bachelor of Business Administration Program in International Creative Industry Entrepreneurship (International Program) operated for almost three years since 2018 by Rattanakosin International College of Creative Entrepreneurship (RICE) of Rajamangala University of Technology Rattanakosin (RMUTR), Thailand. The program has 138 credits with five majors: (1) Accounting and Finance, (2) Asia and International Business, (3) Service Business, (4) MICE and Special Events, and (5) Aviation Management. Students are trained in creative thinking with internship required in the fourth year to apply their knowledge and skills to the real working life. The program commits to development of high qualities and competencies in young talents for their professional and business opportunities as entrepreneurs/ intrapreneurs. The program equips students with the most needed critical qualities--critical and creative thinking, networking, and communication skills. Extensive discussion of the cutting-edge industries and business practices helps enlarge the perspective of young people to vision themselves and their ideas in the new business arena. The business course contents have been updated and modified to ensure that the graduates be equipped with the most progressive business skills and visions. By the end of their second-year study, students choose to explore specific business sectors of their choice and a "true and through" understanding of present and future perspectives of their selected areas. Graduates are expected to enter the workforce confidently both in Thailand and elsewhere.

4. Program Operations

As of now, the currently registered students in the BBA Program in International Creative Industry Entrepreneurship are mainly Chinese. First of all, foreigner students are provided from the first day of their arrival with airport pick-up service, dormitory, student visa application, and other supporting facilities. The Program arranges for an orientation to inform students of the curriculum, academic regulations, followed by a university tour to get access to the central library, working space, computer rooms, and recreation facilities. Regular academic, social and cultural activities and projects are organized and supported to enrich their learning experience in successful entrepreneurship as well as Thai culture and tradition. Moreover, the Chinese coordinator helps with communication in Chinese with students.

From the author's observation, most Chinese students are well-disciplined, conscientious, polite, rather shy and cooperate well with the program staff according to the given guidance. Only a few of them encountered slight problems in adjusting themselves to academic and social life on campus in the first stage of program attendance and later on managed to overcome those limitations. The Program has provided for students supplementary tutorial sessions in subject contents as well as communication skills as needed, and organized social activities and cultural trips to ease up their adjustment into the new cultural environment. In particular,

the activity *Toast Master Club* is meant to develop leadership and public speaking skills. Students are guided in their project work and assisted with additional review of the course contents before the final presentation or examination as required by individual courses. They are taken on business trips to learn from successful organizations prior to internship and program completion.

5. Reflection

In 2019 the Program had to cope with the pandemic COVID-19, and arranged for online teaching and learning achievement assessment. Students' parents were concerned about hygiene safety and precautions. As a result, online meetings like Microsoft Team, Zoom and VooV have become the main teaching tool to reach students in China, most probably until the pandemic is over in one year's time. It is really a true challenge for the program staff to provide the online teaching option that best suits international students in time of crisis and beyond.

Having been through the BBA program operations for almost three years, the author has noticed that Chinese students' strength lies in business content and digital knowledge, but need more support for development of the 21st century soft skills that deal with interpersonal relations, teamwork, and communication skills and strategies. To the author, diligence and good self-discipline shown by students would certainly be a good potential for their development in critical thinking and creative entrepreneurship and management as the ultimate goal of the BBA Program at Rattanakosin International College of Creative Entrepreneurship.

6. The Author

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Authors should submit a non-formatted WORD file of their manuscript in single spacing (see Section 3: For Authors below) to Editor-in-Chief 2 Ruja Pholsward <rujajinda@gmail.com>.

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3. For Authors

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Paper size: Standard A4

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Left margin: 1.25 inches	Right margin: 1 inch
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3.2.1 The title: The **title of the article** must not exceed 2 lines. A title itself has to be informative and indicates the main topic in the article. The title should be set in the center of the page, using upper and lower case letters of Times New Roman 12 points and printed bold. If there is any symbol, its size must be the same as the text in that line.

3.2.2 Author's name: The author's name and last name are in Times New Roman 11 points in upper and lower case letters in the center of the page below the title of the article. In the case of multi-authorship, identify each author by superscript numbers at the end of the author's last name.

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3.2.4.1 Abstract should be informative and state what was done, obtained and concluded. It should be accurate, self-contained, concise and specific, coherent and readable, and reflect only what appears in the original paper. An abstract should contain the following basic components: (1) purpose/motivation/problem statement, (2) methods/design/procedure/approach, (3) results/findings/products, (4) conclusion/applications/research limitations/implications (if applicable), practical implications (if applicable), pedagogic or social implications (if applicable), and (5) originality/value. The length of the abstract should be about 150 words and not exceed 200 words. Type the word "**Abstract**," using Times New Roman 11 points and print bold, left-hand justified. The abstract should be written in one single-spaced paragraph under the heading.

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3.2.6 In-text Citations: Authors are to give references to all the information obtained from books, papers in journals, websites, or other sources. The Author-Date System should be used to cite references within the paper by using the author's last name and date (year), separated by a comma in parentheses; for example, name(s), year.

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3.2.7.1 Tables: The large-sized table format should not be split into two columns but small-sized table can be fit into the column. Each table must be titled, numbered consecutively and complete with heading (title with a description that goes above the table). The word "**Tables**," including number should be typed using Times New Roman 11 points and bold, left-hand justified, and follow by regular 11 points Times New Roman for the heading.

3.2.7.2 Figures: Line-drawn graph or Figure (in black) is accepted. Also, in the case of photographs, glossy photographic prints, 3.5 x 5.0-inchs, should be submitted concurrently. Similar to tables, large-sized figure format should not be split into two columns but small-sized figure can be fit into the column. Each figure must be numbered consecutively and complete with caption under the figure. The word "**Figure**," including number should be typed using Times New Roman 11 points and bold, left-hand justified, and followed by regular 11 points Times New Roman for the caption.

3.2.8 Symbols and Units: Every used symbol must be defined in the text and written in the simplest possible way.

3.2.9 Numbering Pages: Manuscript pages must be consecutively numbered throughout the paper except the first page in the bottom center of the page, using bold Times New Roman 12 points.

3.2.10 Reference Lists: The final page contains a list of resources cited in the paper. The style of citations used in RJCM should conform to the American Psychological Association (APA). It is the author's responsibility to ensure the accuracy of all references cited in the paper. References should be listed in alphabetical order using regular Times New Roman 11 points.

3.3 Guideline to References

Abstract

Format:

Author.//(Year of publication).//Title of Abstract (abstract).//*Journal Title, Year,Volume(*Number), /Page number.

Books

Format:

Author.//(Year of publication).//*Title*.//Edition (if any).//Place of publication: Publisher.

Example:

Wallace, M. & Wray, A. (2016). *Critical Reading and Writing for Postgraduates.* Third edition. Thousand Oaks, California: Sage Publications Inc.

Book Articles

Format:

Author.//(Year of publication).//Article Title.//Editor(s) (if any).// *Title of book*.//Edition (if any).//Place of publication:// Publisher,/Page Numbers.

Example:

Hickman, G.R. (2010). Concepts of leadership in organizational change. In Preedy, M., Bennett, N. & Wise, C. (Eds). (2012). *Educational Leadership: Context, Strategy and Collaboration.* Thousand Oaks, CA: SAGE Publications Inc., 67-82.

Conference and Seminar Proceedings
Format:
Conference or Seminar Organizer.//(Year of publication).//*Name of conference,/ Conference date.*//Place of publication (if any):/Publisher (if any).

Example:
Jareonsubphayanont, N. (2014). The international student policy in Thailand and its implication on the 2015 ASEAN Economic Community. *Southeast Asian Studies in Asia from Multidisciplinary Perspective International Conference*, March 2014, Kunming, China.

Dissertation or Thesis
Format:
Author.//(Year of publication).//Title of dissertation or thesis.//Type of Thesis.//Awarding Institution.
Example:
Ua-umakul, A. (2017). The Effects of the Counseling-Based Method on Physics Learning Achievements of Upper Secondary School Students: An Area Focus on Momentum. A Dissertation for the Degree of Doctor of Education in Educational Studies. The Graduate School, Rangsit University.

Editorial
Format:
Author.//(Year of publication).//Title of Editorial (editorial).//*Journal Title,/Year (Volume if any),*/Page numbers.
Example:
Fisher, R.I. (2003). Immunotherapy in Non-Hodgkin's lymphoma: Treatment advances (editorial). *Semin Oncol 30, 2003* (2Suppl 4), 1-2.

Journal Articles
Format:
Author.//(Year of publication).//Article Title.//*Journal Title.//Year/Volume*(Number),/Page numbers. Doi number (if any).

Example:
Srichandum, S. & Rujirayanyong, T. (2010). Production scheduling for dispatching ready mixed concrete trucks using bee colony optimization. *American Journal of Engineering and Applied Sciences, 2010, 3*(1), 823-830.

Trongratsameethong, A. & Woodtikarn, P. (2019). Thai QBE for Ad Hoc Query. *Journal of Technology and Innovation in Tertiary Education, 2019, 2*(2), 1-24. doi 10.14456/jti.2019.7

Letter
Format:
Author.//(Year of publication).//Title of Letter (letter).//*Journal Title,/Year (Volume if any),*//Page number.
Example:
Enzensberger, W. & Fisher, P.A. (1996). Metronome in Parkinson's disease (letter). *Lancet, 1996, 347,* 1337.

Unpublished/In press Article
Format:
Author.//(In press Year).//Article Title.//*Journal Title./*(in press).
Example:
Veena, B. (2004). Economic pursuits and strategies of survival among Damor of Rajasthan. *J Hum Ecol*. (in press).

Websites
Format:
Author.//Title.//(Online).//the full address of the web page, accessed date.
Example:
Charlotte, B. Quotes about Action Learning. (Online).
http://www.goodreads.com/quotes/tag/action-learning, January 18, 2017.

3.4 Manuscripts of Brief Professional Viewpoints for Sharing

The length of Brief Professional Viewpoints for Sharing is about 8-10 typed A4 pages. Its content should be arranged as follows: **title**, **name of the author, name and address of the institution**, **3-5 keywords**, **body text**, **the author's biography** of 50-80 words, and **references**. The format, font, and font size used in each section correspond to those in the section of **3.2. Manuscripts of Original Article**.

3.5 Reprints

During the first two years of publication (2020-2021), authors will receive one free copy of the journal.

RJCM Publication Ethics

RICE Journal of Creative Entrepreneurship and Management (RJCM) has policies on publication ethics after the guidelines given by Committee on Publication Ethics (COPE) <https://publication ethics.org>. Publication ethics policies mainly involve duties of (1) Authors, (2) Editors, and (3) Reviewers.

Authors:

Authors or paper contributors shall not submit simultaneous or duplicate manuscripts. It is imperative that authors submit work of original investigation and acknowledge concepts, research methodology and findings of preceding authors or researchers by giving proper references. If required, authors need to seek permission for the use of specific data or adaptation of research methodology as well as provide evidence on approval of professional ethics in the selected field of study. Plagiarism of all kinds is unacceptable and will result in paper rejection and permanent dismissal by RJCM. Authors shall be solely and fully liable for all viewpoints and research components used in published papers.

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RJCM publishes three numbers per volume annually and welcomes contributors to submit their manuscript in January, May, and September of each year. We accept both academic and research papers in social sciences from contributors.

The length of the unformatted manuscript in WORD can be 15-25 pages in length including references. The contents of the manuscript should include (1) a title with the author's name, affiliate, email address and telephone contact, (2) an abstract of 150 words with 3-5 keywords, (3) an introduction, (4) a rationale and background of the study, (5) research objectives, (6) research methodology, (7) data collection procedure, (8) data analysis, (9) results and discussion, (10) research limitation (if any), (11) conclusion, (12) the author's biography of about 50-80 words, (13) acknowledgement(s) (if any), (14) references, and (15) an appendix or appendices (if any).

All interested readers and paper contributors please contact Editor-in-Chief: Ruja Pholsward, Ph.D., Associate Professor, Rattanakosin International College of Creative Entrepreneurship (RICE), Rajamangala University of Technology Rattanakosin (RMUTR) <rujajinda@gmail.com>, <ruja.pho@rmutr.ac.th>. Please check *RJCM* Publication Policy as guidelines to paper submission. Website submission will be advised after the first editorial screening.

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