PREFACE

Nakhon Sawan Rajabhat University – an academic institute for local development whose ideology includes building public knowledge, recovering learning power, promoting local wisdoms and creating arts and sciences for the development, stability and sustainability of people – realizes the importance of this issue. We organize the 1st national and international conference on “Understanding the Change of Localization in the 21st Century” (ICNSRU2016) for exchange of knowledge among scholars, researchers and all people involved. All knowledge is the core idea in the development of the local community. The outputs resulting from the research will be published and lead to utilization in the development of the local community to achieve stability, prosperity and sustainability. As a result, the research network cooperation between educational institutions, government, public sectors, private sectors and local governments should be formed to develop local communities.

Finally, thanks to Universities and institutes which co-host the conference composed of Kamphaeng Phet Rajabhat University, Pibulsongkram Rajabhat University, Uttaradit Rajabhat University, Chiangrai Rajabhat University, Panyapiwat Institute of Management, Boromarajonani College of Nursing, Sawanpracharak, Nakhonsawan, and HUE University, Vietnam. Including, government and private sectors, Subdistrict Administration Organizations in Nakhon Sawan and Uthai Thani support this conference.

The ICNSRU2016 Organizing Committee
MESSAGE FROM THE PRESIDENT OF NAKHON SAWAN RAJABHAT UNIVERSITY

Nakhon Sawan Rajabhat University is a higher education institution for local development. The core functions of the university are to strengthen the nation’s wisdom, play a leading role in promoting local wisdom, preserve and promote arts and cultures, conduct research, and improve and distribute jointly with developing technology for sustainable community development. Based on these missions, the 1st national and international conference on “Understanding the Change of Localization in the 21st Century” (ICNSRU2016) will be held by the Research and Development Institute of Nakhon Sawan Rajabhat University, in cooperation with Kamphaeng Phet Rajabhat University, Pibulsongkram Rajabhat University, Uttaradit Rajabhat University, Chiangrai Rajabhat University, Panyapiwat Institute of Management, Boromarajonani College of Nursing, Sawanpracharak, Nakhonsawan, and HUE University, Vietnam. This conference is also supported by government and private sectors as well as Subdistrict Administration Organizations in Nakhon Sawan and Uthai Thani.

I hope this conference will be a platform for scholars, researchers and participants to share their ideas and learn from each other in order to create new knowledge that can be adopted to develop our communities. It also provides researchers with an opportunity to disseminate their work and a forum on stable, prosperous, as well as sustainable local, community and nation development. Additionally, participants and researchers will have opportunities to build up a network of conducting research and future cooperation.

Nakhon Sawan Rajabhat University would like to thank keynote speakers, professionals, universities, supporters, committees, researchers as well as exhibitors for giving support and helping us to fulfill the conference objectives.

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A Development and Transfer Body of Knowledge Enterprise Community Researcher for Enhance Enterprise Researcher Community Competency on Sufficiency Economy for Farmers in Surin, Bureerum and Srisaket Province

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Abstract

The purpose of this research were as follows: 1) development body of knowledge enterprise community research for enhance enterprise researchers community competency on sufficiency economy for farmers in Surin, Bureerum, and Srisaket Province, 2) transfers body of knowledge enterprise community research for enhance enterprise researchers community competency on sufficiency economy for farmers in Surin, Bureerum, and Srisaket Province. The two hundred farmers were purposive sampling selected from farmers in Surin, Bureerum, and Srisaket Province. This research conducted during year 2013-2014.

The instruments used for gathering data were: 1) a curriculum development training enterprise community research for enhance enterprise researchers community competency on sufficiency economy for farmers in Surin, Bureerum, and Srisaket Province, 2) a satisfactions questionnaire with a five-level Likert Scale, reliability value of 0.85. The statistical procedures employed in the data analysis included percentage, mean, standard deviation and t-test.

The results the study as follows:
1) The results of the comparison of pre-test scores and post-test scores all lessons were significantly difference .05
2) The results of the satisfaction of farmers among a development and transfers body of knowledge enterprise community research for enhance enterprise researchers’ community competency on sufficiency economy for farmers in Surin, Bureerum, and Srisaket Province was found to be a high level.
1. Introduction

Research is fundamental to the creation and development of knowledge and new technologies that can create a breakthrough for the country. In the past, Thailand has changed and society is a consumer society in all its aspects. Consumables Knowledge and technology as well as cultural outsiders, but Thailand still lack the ability to get the technology used or be adapted to suit the socio Thailand also does not produce or create or develop the knowledge, technology and culture. Despite faring Thailand has many things to offer to the development of education and contributing to the development of such resources. Biodiversity, cultural knowledge and wisdom Thailand. Research is a very important mission. Development and resolve all issues to achieve effective and have a database of research is a key component. Teaching is as well to develop learners as individuals qualities include integrity, knowledge and skills to make decisions and solve problems, teachers will use the research results and conducting research to develop a significant (Chitra. son Tra earring. 2550: 28), the research is important, and more important, more process knowledge with intellectual activity. Knowledge discovery from such research will lead the way to solve problems effectively. The discovery of new knowledge that benefits both the knowledge and the adoption invented something new.

Community Enterprise, a public organization set up under the SME Promotion Act of 2548 is based on the philosophy and methods of cooperative and sustainable economy, but smaller. Flexibility to meet the target well. By a person or group of people gathered at least seven people to a legal entity or an entity that is a combination of a bond and a life together. To produce goods or other services to achieve socio-economic development of learning communities. Which is based on its members to help each other. Community economic development of the communities to be strengthened. Self-reliance by creating opportunities to encourage learning. Local Wisdom Management of community funds creatively. Monetization replace imports from outside the community. Developing the capacity to manage. The implementation of community-oriented social gains, including a strong sense of community. The peace of a society that is based on the sufficiency economy. Currently, there are communities across the country to file a registration number 23,910 nationwide. It also has a network of community enterprise was filed by 28 members of a total of 394 529 people for the province has filed communities most top 5 include Rai 1139 of Mai 1116 in Roi 1044 of Khon Kaen, 924 and Kalasin 625 places. (Department of Agriculture. 2549), which was filed on the category of product has a relatively diverse community such as processed food products manufacturing plant products, textiles / clothing, Livestock Production inputs Wicker herbal products Flower production, fishing, gift / souvenir etc. There is also a community of business services to their registered travel community savings groups, such as mechanical repairs.

From interviews with community groups in the South East found that at present there are barriers in the research community is important. 1) Lack of knowledge and understanding of the research community and 2) income support and do not know the source of research funding 3) lack of incentives for research, 4) lack of experience in the research community and 5)
community not undergo learn from. Do your research researchers 6) research problem is not caused by problems of the community 7) determine the research community did not participate? 8) Most research into personal research project is a lack of process knowledge between research projects between researchers and stakeholders 9) the link between research and policy and of the parts involved also. Rare 10) Lack of factors contributing to the research, 11) do not have time to research and 12) do not see the importance of research, etc. What is especially worrisome is that the community enterprise in the South East. Still cannot manage to develop our own research, come up with a system to address shortcomings and problems as follows. 1) Lack of setting and reviewing strategic research participation. 2) The lack of a framework for research. 3) The areas are not clear 4) the lack of a systematic plan to develop our research 5) lack of analysis, research issues and problems involved. 6) Monitoring data in a detailed and accurate 7) lack of an assessment of the feasibility and 8) to document summarizes our research does not host or clear accountability addition, government officials still were not ready for. Coordination and integration of government projects. Support for instructions from authorities is minimal. Storage lack of detail. The leader or the mission and role of many. Members do not see the importance of their participation. Selection does not follow the procedures and conditions. The preparation stage, the community and the community needs analysis done hastily took a little communities still lack knowledge and understanding of the community plan. The community does not support the planned budget. Lack of support, guidance and lack of monitoring and evaluation continues. Supported by funding procedures and conditions, however, the development of community enterprises in the three northeastern provinces Surin, Ram and Si Sa Ket is the fundamental problem. 1) The products lack the spirit of the Manufacturer 2) operations. Management No community participation in the planning figure 3) the nature of the group is mainly characterized by the establishment of the government, which does not cause a strong and sustainable 4) management of the government. There are no clear criteria conflicting agencies. Working for their work, regardless of the impact on the community 5) Support Agency. Lack of understanding of the true greats of the community and work overlap and duplication. 6) Expo Not the kind of product and consumer behavior 7) skilled manufacturing workers over Thailand 8) no place. Center or hosted in brainstorming to develop its community clearly 9) database producer groups / communities unreachable 10) costs of production. 11 high unit cost) producers, but consumers are increasingly less 12) of its narrow 13 major markets), the promotion of exports rather than 14) to improve the quality of the product has a condition that is not consistent with the community. Inconsistent with local 15) behind the production needs 16) to produce in large quantities. As a result, the product quality is 17) the difference between the production of large machines with 18 communities), sales volume does not match the actual sales reported to the governor 19) the lack of market information. Enabling operators to plan not good enough. 20) Restrictions on the distribution. Make residues 21) the product sold at a low price does not break 22) the lack of knowledge and experience in management. You cannot compete with other businesses, and 23) inappropriate use of resources in some communities and
adversely affect the environment. For this reason, researchers are interested in developing and transferring knowledge to the research community and research capacity building, community enterprise philosophy of sufficiency economy for farmers in Surin. Buri Ram, Si Sa Ket and more To develop a community enterprise potential and capacity in the research community can effectively enhance the quality of life better.

**Research Objectives**

The development and transfer of knowledge to the research community and research capacity building, community enterprise philosophy of sufficiency economy for farmers in Surin. Buri Ram, Si Sa Ket and aims

1. To develop cognitive research community to enhance research community based on the sufficiency economy philosophy for farmers in Surin, Buri Ram, Si Sa Ket.

2. The transfer of knowledge to the research community to enhance research community based on the sufficiency economy philosophy for farmers in Surin, Buri Ram, Si Sa Ket.

**Scope of Research**

The development and transfer of knowledge to the research community and research capacity building, community enterprise philosophy of sufficiency economy for farmers in Surin. Buri Ram, Si Sa Ket and scope of the research is as follows.

1. Population are farmers, community groups with their own needs and wants to fix a problem with the community in Surin. Ram and Si 600

2. Examples include farmers groups, community enterprises that are looking to improve themselves and the group wants to fix the problem, which has operations in 20 communities, including 1) the production of organic rice 2) production of artificial flowers 3) Production of vegetables Cha. money 4) pig 5) raising native chickens 6) planting onion 7) planting garlic 8) catfish pond Cement 9) production of wicker, bamboo, 10) turn-eating insects. 11) mushroom basket 12), the frog 13) silk weaving 14) Cowboys 15) to grow organic vegetables, 16), rubber 17) cultivated papaya organic 18) planting lemon outside. in the Cement pond 19) to grow vegetables. And 20) Food Preservation Has come from choosing specific (Purposive Sampling) 200.

**Variables**

1. The variables include the transfer of knowledge to the research community by training.

2. Variables include knowledge, skills and attitude towards the transfer of knowledge and research community.

**2. Research Methodology**

The tools used in this research. A questionnaire on the satisfaction of the farmer community enterprise is divided into the following two.

The first survey was a questionnaire items (Check List) on the status of farmers about gender, age, marital status.
The second is a questionnaire about their satisfaction with a rating scale (Rating Scales) with five levels of lift Kirtland. Which has set up a five-star rating is much more moderate, less and less possible.

The process of creating a research tool. The tools used to collect data. Follow these steps:

1. Studies concepts and principles of books and academic papers related research on satisfaction, quality of work life.
2. The data from the study process. A structured questionnaire to determine the extent of the content.
3. The concepts and information. Conducted a questionnaire on the extent of the content. The data that is ready to offer expert. For advice and suggestions for improvement.
4. The questionnaire was modified and approved it. Experts have proposed three criteria to consider is a graduate of the master's degree in the field of agricultural systems. Or research or educational measurement and evaluation. Or curriculum and instruction Business Administration or related field and to determine the content validity and accuracy of the language. Then came revisions and additions to the recommendations of experts.
5. For the content validity (Content Analysis) The index for consistency between question on purpose (Index Item-Objective Congruence: IOC) selected the questions with the IOC than or equal to 0.50 as the index of the questions. Consistent with the objective questions (Index item-objective Congruence: IOC) is 1.00.
6. The questionnaire was revised to trial with farmers in the parish community enterprise Lee Surin Chom Phra Chan District Hub district rostrum finish. Province and District Clarinet Zodiac Salai district of Si Sa Ket. The sample is 30 people to the faith by means of a coefficient alpha of Cronbach's the confidence level of 0.93.

3. Results

The research findings are as follows.
1. Check the model. Developed training cognitive research community to enhance research for the business community by the simple philosophy for Agriculture in Surin. Ram and Si Sa Ket. There were the appropriate training, knowledge, research community and to strengthen the capacity of researchers for the business community by the simple philosophy for Agriculture in Surin. Ram and Si Sa Ket. The overall level the first two items in the order of highest to lowest were: 1. To determine the content of each (X = 4.57) have the most value. 2. The content of the course, followed by the actual implementation (X = 4.55) 3. Events and training courses in each subject (X = 4.52) 4. Learning content in each subject (X =. 4:51) 5. Course content (X = 4.49) 6. Outline of the scope of the training course (X = 4.48) 7. Learning to use in enhancing the knowledge (X = 4.48) 8. The aim of the course (X = 4.45) 9. Foster learning (X = 4.44) 10. In principle, of course, the actual implementation (X = 4.41) 11. Sorting out the content of each course. (X = 4.41) and 12. The duration of the training (X = 3.61), respectively.
2. To evaluate the consistency of the program.

The results show the outlines the consistency of cognitive training research community to enhance research for the business community by the simple philosophy for Agriculture in Surin. Ram and Si Sa Ket Ranged from 0.80 to 1.00, sorted by topic below. 1) The problem, of course, the aim of the course. 2) The difficulty of the course with behavioral objectives of the course. 3) The problem, of course, the content of the course. 4) The problem, of course, the topic of training. 5) The aim of the course with behavioral objectives of training courses in each subject. 6) The aim of the course content of the course. 7) The aim of the course on the topic of training. 8) Behavioral objectives and content of training courses in each subject. 9) Training course on the topic of training. 10) In the behavioral objectives of training activities and training methods. 11) In subjects with objective behavioral evaluation. 12) Behavioral objectives of training in the evaluation. 13) The content of training courses on the topic with the media. 14) The content on the topic of the evaluation. 15) Activities and training on the topic of media and 16) activities and training on the topic of the evaluation.

3. Results curriculum development training cognitive research community to enhance research community.

Table 1 compares the achievement of curriculum development training cognitive research community to enhance research community (5.00 points)

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<thead>
<tr>
<th>Test</th>
<th>n</th>
<th>X</th>
<th>SD</th>
<th>t-test</th>
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<tr>
<td>Pre used</td>
<td>200</td>
<td>3.77</td>
<td>0.82</td>
<td>-6.551*</td>
</tr>
<tr>
<td>Post used</td>
<td>200</td>
<td>4.27</td>
<td>0.64</td>
<td></td>
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* <P.05 a statistically significant level. 05

Table 1 that achievement before and after the training curriculum of cognitive development research community to enhance research community. The difference was statistically significant level. 05.

Table 2, the average and standard deviation of satisfaction of the farmer community enterprise with the knowledge of the research community.

<table>
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<tr>
<th>Items</th>
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<th>SD</th>
<th>Interpret</th>
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<tr>
<td><strong>Body content knowledge</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1. Body content knowledge before training</td>
<td>3.77</td>
<td>0.82</td>
<td>Middle</td>
</tr>
<tr>
<td>2. Body content knowledge after training</td>
<td>4.26</td>
<td>0.64</td>
<td>High</td>
</tr>
<tr>
<td>3. Manual</td>
<td>4.27</td>
<td>0.62</td>
<td>High</td>
</tr>
<tr>
<td>4. Appropriated content</td>
<td>4.11</td>
<td>0.64</td>
<td>High</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4.05</td>
<td>0.46</td>
<td>High</td>
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Table 2 shows that the satisfaction of the farmer community with the knowledge of the research community as a whole at a high level. ($X = 4.11, SD = 0.44$).

4. Discussion

1. Achievement before and after the training curriculum of cognitive development research community to enhance research community. The difference was statistically significant at the .05 level. According to the resolution of the base. It is because the transfer of knowledge to enhance research community has taken the knowledge base by focusing on community-based instruction integrated. It was also used for teaching and learning experience producing communities.

2. Satisfaction with the development of cognitive research community to community capacity building, researchers found that satisfaction with the course of the research institute for training teachers of basic education in Surin. The overall level is based on assumptions it is because the design of instruction are performed to analyze the needs of the students. The feasibility study and the consistency of the program, according to expert opinion. Course structure to achieve the stated objective by focusing on activities with the students to share their learning experiences are conducted in a systematic sequence begins. Sparked the idea to expand the idea. Practice Presentations a summary and evaluation and application of knowledge to use. The speaker was an example of the real lessons about community enterprise products using peer teaching and learning through Community-Based. The instructor will serve to facilitate guidance and help when necessary. The question at issue learners to think and solve problems all the time. In addition, the course will encourage students to learn together. The exchange of learning experiences to friends to friends anytime. Allow the teaching of life and actual practice
the students were satisfied with the teaching of this lot. Consistent with research Pichai Rich et al (2550) studied the technology suitable for commercial production of fruits that the evaluation of the project. The evaluation of the questionnaires before and after the training showed that farmers understand the production of fruits increased from the number of people with an interest rate lower or much lower. Decreased and the number of farmers who have knowledge levels increase in all sections of the assessment of the evaluation after training farmers, 60% are satisfied in the form of training and more than 80% had cognitive content. What can be treated in accordance with their own research Krisda. Lt. Check at the General Shining et al (2550) studied the training requirements and program management, technology transfer appropriate for farmers. The new generation in the province of Project 1. A sample training requirements of the agriculture. Most systems, sustainable agriculture and plant sciences. And Veterinary Science Variations in the knowledge field trips, lectures and practical work. Consistent with research blessings of joy Ananta Porn (2545) Factors Affecting the Adoption of Agricultural Technology Project Hybrid Case province found that most farmer’s average age of 45 years as head of the family. Completing primary education Married the farm has its own family of two people without hiring more people. He had been trained to do integrated farming. Get news About the Integrated Farming. Period of 6-10 years to learn farming and agricultural areas of the elder’s 1-5 rai of crop area. Water use and rain. The Animals Net income 40000-60000 baht and lack of investment in agriculture, most farmers have the knowledge, attitudes and behaviors about farming blended average. Marital different. As a result, knowledge incorporating different aspects of farming with a statistically significant p-value equals 0.016 Net income and different sources of funding have resulted in a different attitude. To accept the farming mix different significant statistical p-value equal to 0.158 and 0.036 respectively lie from this acreage different also affect the behavior of agricultural combines different. a statistically significant p-value equals 0.033 consistent with the research of commemoration Wadi Singh Suri. (2545). studies have expected role in contributing to the development of agricultural projects. Agricultural technology transfer through Farmers Field School in the initiative. Found that farmers with land holding per household 41.10 acres (6.58 ha) in the area made an average of 37.92 acres (6.07 ha), most farmers do two times a year by an experienced farmer average 32.84. Years of use Supanburie one most expected role in contributing to the development of agricultural projects, “the Agriculture technology process farmers Field school initiative” the four main roles that overall, farmers expect. joint action every time an average of 60 percent of the activity is expected to contribute the most. Knowledge or experience to share with group members. To resolve the most pressing problems are two of the main problems is the low product prices and inputs are expensive. The hypothesis testing found that farmers receive a number of sources of news do more. Are expected to contribute to the plan. Practice and more significant level. There are 05 farmers and workers in households that do more. Are expected to participate and take advantage of the more significant level monitoring and evaluation. 05. Also expected to participate are more practical significance. 01 is consistent with the research of Chandra Surabhon Admixtures and faculty. Education, technology transfer,
leading farmers in Phitsanulok. This research finds that aims to track the performance of the leading farmers in Phitsanulok. The training was organized by the lecturer of the Department of rice to serve as a guest speaker to convey to local rice farmers professionals. And provide advice to farmers in the community. In a study of 11 people from Phitsanulok Rice Research Center. And leading farmers from Phitsanulok. 22 people showed that after the training, farmers leading 77.27 percent of the knowledge that has been extended to professional farmers. But some lack the skills, knowledge and technology. Therefore, farmers should be selected as the leading feature set as rice with knowledge, skills and time to transfer knowledge to the professional farmer. And should be able to coordinate seamlessly with simple hard key. The Public Relations Department of rice and to clarify the properties of leading farmers. Leading to farmers to farmers participating in the project should be aware of and plan for rice production. To achieve interoperability between agencies and farmers in line with the research of the Holy Edchns family name. (2555).

Studies on the agricultural extension officer with the model using e-Extension to agricultural technology transfer. in the BMA revealed that 1) Agricultural extension officers are women aged 38-50 years accounted for 55.1 percent, 35.4 percent graduated with a bachelor's degree. 72.4 percent have experience in the field of Agricultural Technology Transfer 6-25 years and 26-35 years accounted for 33.9 percent of the same experience in the field of agricultural information work 1-5 years old accounted for 46.4 percent of the salary. Get 13501-30000 baht per month, representing a 39.4 percent level or the academic level agricultural extension specialists / experts in agricultural extension officer. And 60.6 percent are exposed to information technology accounted for 90.6 percent, 2) agricultural extension officer with comments on the format for the transmission of e-Extension agricultural technology with a moderate level.3) Agricultural extension officers have comments on a form e-Extension with agricultural activities for technology transfer at least agree. And 4) agricultural extension officer with gender, age, education. Work experience in the field of agricultural technology. Work experience in the field of agricultural information. Salary levels Rank or position and exposure to information technology, agriculture. Salary levels Rank or position and exposure to information technology was not associated with a comment on the model using e-Extension for technology transfer and comment on the model using e-Extension with promoting agriculture. Technology transfer is in line with agricultural research.

Peerless sun Pattanakij. (2551). The study was a project of the agricultural technology transfer Dabos. Samut Prakan found that most farmers career four main groups mushroom growing vegetables hydro enough Knicks. Vannamei and fish farming both want to bring knowledge to good use on a personal level. Farmers like mushrooms knowledge processing mushrooms. Vegetable Growers Hydro Knicks need enough knowledge of the market. White shrimp farmers need to know the culture. Increase Productivity The value-added shrimp and fish farmers do not need any extra knowledge. Technical requirements for technology transfer to farmers with agricultural technology group is to form a lecturer demonstration vegetable growers hydro enough Knicks. Shrimp and fish feed demand model training Vegetable Growers Hydro
Knicks and I want to feed the fish model study. Exhibition Farmers grow vegetables and mushrooms, as well as hydro Knicks media formats like VCD through websites mushroom farmers who want to form a pamphlet. The white shrimp farmers also want the format for the media through TV, no DVD because farmers do not want to turn to a different player. Consistent with the research of Ampha Sri traders. (2557). studied technology management cooperative mill communities to build their economic standing: the case of mills Community Sabres nude district Wong province found that most respondents know or have heard of waxy band and realistic. The consumption of rice Wong Kalasin The softness of the rice and the island well. The second is the unique aroma and taste. The frequency band in buying rice for a long time. And those who have consumed rice Wong. Most need to consume rice band in the future. The consumer does not think consumers will continue in the future with the band rice is rice, followed by the band’s hard to buy higher priced rice and short shelf life. The consumption per month is between 1-20 kg and rice consumed a large portion of the plant itself or from their families grow, and if you purchase a large amount of time is between 1-5 per kg for rice.

3. Development and transfer of knowledge, research community and to strengthen the capacity of community-based research enterprises, the main philosophy for Agriculture in Surin. Ram and Si is 20 points below.

Production of organic rice Rice, organic rice, organic production, a production that avoids the use of synthetic chemicals or other substances, such as chemical fertilizers, growth regulators and herbicides. Fungicides and insect pests of rice in the process. Production and during storage productivity. The area planted the large contact area and the soil fertility is naturally high. Water for planting. Avoid areas with the use of chemicals in large quantities, contact a long time or are contaminated with chemicals and away from the area with the use of agricultural chemicals. The area is monitored for residues in the soil or in water. The use of rice Most varieties of rice, jasmine and 105 b. 15, both of which are varieties of rice seeds specially prepared with quality grain. Choose seeds that are produced from the seed production plot has been well-prepared soil, rake, and plow in regular furrows for the second time by the plow roughly for the first time and how to plant the rice valleys black lace. The rice seedlings should last about 30 days, your seedlings grow healthy and free from disease, insect damage. The frequency spacing is approximately 20x20 cm seedlings than 5 per clump of soil fertility management. Managing soil fertility. Organic rice to avoid using chemical fertilizers. Managing soil fertility for organic rice production. Consistent with its research the morale. (2548). Education strategy development, technology transfer and agricultural crops in the FFS process works. District Lankrabue Kamphaeng Phet found that 1) the technology transfer process agricultural crops in the works include the FFS. (1) The promotion of the establishment of farmer groups. A group of farmers for 20-30 people (2) are prepared to learn and practice, together with the establishment of a knowledge exchange (3) officers have been trained in the knowledge transfer to farmers in the process. School rice farmers in the province, (4) a group of farmers to test their knowledge of the period. And (5) the report and concluded that the relevant authorities 2) the transfer of agricultural technology,
according to the school, rice farmers in the initiative are: (1) farmers are not confident of the question by the group (2). Learn narrowness and lack of funding (3) membership, farmers were transmitted on time (4) Agricultural extension officers and farmers held a demo day (5) to write the book, not the farmers, (6) the farmer does. In reporting the results and conclusions as well. (7) Agricultural extension officers and farmers do not elect a speaker. Agriculture 3) demand by the Agriculture Technology School of rice farmers in the initiative include. (1) Requires that agricultural development and management group with a strong (2) a place to exchange knowledge and to learn the appropriate permanent (3) a group of farmers to receive uninterrupted transmission (4.) is to organize a demo day. (5) Improve model evaluation (6) membership, farmers have to contribute, report data and results. And (7) a lecturer of Agriculture is a mainstay of the knowledge transfer to farmers, 4) educational strategy, technology, agriculture, according to the school, rice farmers in the works to have success in the offense are: (1) the establishment of the group. To resolve the problem, (2) determine the knowledge and prepared to learn and prepared to learn (3) a review of the knowledge and knowledge (4) to determine the reason and necessity. (5) Schedule assessment phase 3 (6) monitoring and reporting. And (7) the development of leadership and expanding membership. 5) After analyzing internal and external factors related to the transfer of agricultural technology through Farmers Field School in the works already. The strategy developed by the Agricultural Technology Transfer through Farmers Field School in the initiative. Meet key strategies include (1) encourage farmers to be able to analyze and plan their own. (2) a place to practice and study a common platform. (3) Create a participatory learning process, (4) a plan for the funding request. (5) Improve the evaluation system. (6) Members have defined contribution report and summary, and (7) development leaders as speakers and consistent with the research of Mr. Judson the optical Savings (2555) studied fulfilled the transfer of technology to produce grain. Members of the agricultural Extension center and Community rice, lotus sleep. Mae Lao District, Chiang Rai Province found that this study aimed to fulfill the rice seed production technology solutions to the problems in the use of technology to produce low-quality seed rice farmers. The center promotes and produces varieties of lotus, sleep 20 people by questionnaire. Achievement test before and after training. The samples from the transgenic rice seeds.Send Rice Ministry of Agriculture and Cooperatives Check certified seed after agriculture brings insights gained from the transfer of technology into practice. Statistics for data analysis were percentage, frequency, average correlation coefficient. Studies using questionnaires fulfilled before the training. The level of information and knowledge. Insight care to produce rice. Physiological characteristics of rice The quality of the seed Custody converted rice production The knowledge Level of knowledge With an average understanding The study by Fulfilling the test series After training found that the information knowledgeable. Understanding the increase in the level knows better understand the results of certified quality seeds found. Seed of 20 samples met the standard of 18 samples, and do not meet the standards of the two samples of seeds of other campsites, more than 20 seeds in line with the research of the city still standing (2544) studied factors that influence adoption. Technology transfer,
integrated pest management, rice farmers in Phanom Thuan district of Kanchanaburi Tha Muang. The objective of this research was to evaluate the technology of hybrid rice pest management. And to study the social and economic factors that affect the adoption of technology by farmers in Phanom Thuan district. And Tha Muang District Karnchanaburi Questionnaires and segmented the respondents into two groups: those who had attended the School of Agriculture and the group had not participated in training groups of 102 people attended the statistical analysis of variance and multiple classification analysis. Found to have been taught by the media. The Institute is a member of the agricultural use of pesticides that bundle. Affect the adoption of hybrid rice technology to eliminate the enemy at a statistically significant level. 0:05 consistent with the research of wreaths Wan. Similar. (2554). Studied business strategies, organic community enterprise Confederate Non Kho fields offense that community enterprise Confederate Non Kho field. Province Due to the incorporation of community members with the goal of increasing the value of the rice is done on a regular basis. To supplement the family income. The implementation of a community and form part of the results showed that the management group. The group has managed to form a committee. By acting together, aptitude, knowledge, ability, through the approval of the Board of Directors and members of the board, each party, including the president, vice president, secretary, treasurer, coordinating and advisory group with the rules and regulations are strict for all members to respect. Founder of the group praised the emphasis on the participation of members and operates a network. Sesame has been made by members of the delegation are fully capable and happy in their work. Evaluation and committee meetings, and members are continuing. Monthly meetings at the annual meeting. And an urgent meeting The production management group that produces four types of rice, organic rice, jasmine rice, jasmine rice 105 Red Glutinous Rice. 6 with the purchase of paddy strict. A stage production of organic paddy system. All manufacturing processes, chemical-free and leading scholars. Combined production Seeds, organic fertilizer production within the group. Brown rice is a process and system standardization. And crop rotation to maintain soil during the dry season, and increases revenue another way, the Treasury found that raising capital from the shareholders of the members. Capital loan and the share of profits each year. The budget for subsidies from the government to develop the group. With the division of profits to members in proportion to the votes each year for the first time at the conference. Financial notes in diary form separate parts. And presented at the meeting on the agenda Strategic Marketing 1) Products found that brown rice has 10 patterns and organic brown rice the main group with four kinds of products have been certified rice, organic products, OTOP 4 stars. The conventional and vacuum packaging. Name of product groups "Rice moral" 2) the prices that are priced based on the cost of production and prices of networking groups are aligned close together and sold both wholesale and retail. 3) the distribution channel is found. a channel is a major customer. And government support. And planned negotiations on the implementation of 4) Marketing Promotion found that public relations activities. According to government
According to the company, and customers who purchase the product with the event organizer, with the support of government agencies.

5. Recommendations

Suggestions for adoption.

1. Before introducing training courses to transfer knowledge to the research community. Facilitator guide for training. Educational needs and interests of the farmers. The data used by the context of the transfer of knowledge by training sequences in six steps.

   1) Speaker to determine the purpose of training, including what happened to those who want to be trained. It will provide the trainees have been learning all three aspects of the knowledge, skills and attitudes. The purpose of the project is the bestselling author.

   2) To target speakers include information about who is trained as anyone. What position what have many people.

   3) Determine the resource box content knowledge. After studying documents Texts related training content to be content with the selection criteria described below. The key to learning is accurate, modern Interesting it is learned Objectives It is useful to students and is provided to the students.

   4) The speaker frame learning activities. After studying and analyzing documents Texts related to the learning experience for the recipients of knowledge. The process is concluded Based on the content knowledge and the knowledge that the recipient has been set. Making it possible to determine the activity of learning the process described below. The study visit Practice its activities include learning, Group activities and recreation

   5) Do Instructor defined evaluation methods? The evaluation of the training is consistent and appropriate to the purpose of the course. Target group Content knowledge and learning activities. Including taking into account the environmental factors involved in the training and the atmosphere was the basis of the recipient’s knowledge by assessing two ways to evaluate the effectiveness of the recipient’s knowledge and assessment of management training.

   6) Checks the course lecturer. The objective was to study the defects should be considered by the experts. Conducts inspection the assessment of training courses created to provide expert evaluation. Things to check the accuracy of appropriate curriculum to learners in the process and content knowledge.

2. Guidelines for the transfer of knowledge. Trainers should continue as flexible.

   1) The speaker should be prepared by pre-planning is generally good, although there are ways to convey it. But if it lacks content and proper preparation. The operation was not successful.

   2) Convey how each method has both advantages and disadvantages lecturer should use methods appropriate to the target audience and the content of the technology itself.

   3) The trainers need to train themselves to become familiar with how to convey the uncomfortable. By combining practical experiments with other ways more interesting. If teaching is to make it fun. The story is fun as well.
4) The facilitator should encourage participation among employees at all levels should be encouraged to participate in both the planning and implementation of broadcast production.

5) Speakers should be able to provide farmers or community groups or individuals targeted mainly engaged in learning activities as much as possible in learning activities in each situation may vary. It will be an opportunity for students to participate fully in all activities.

6) Use the speaker should have learned by practice as much as possible to learn by practice or learning by doing (Learning by doing) as a demo and so on.

7) Speakers should be reinforced with praise. Reward the behavior of individual learning goals as possible in a positive encouragement to those who are trying to learn, but also unfulfilled.

8) Should lecturer teaching or knowledge seriously and strengthen the learning atmosphere to relax with humor on occasion.

3. To encourage the transfer of knowledge in the organization. By conducting appropriate follow.

1) The speaker encouraged the farmers community enterprise learning by teaching and sharing knowledge.

2) Lecturer and community groups, farmers have used the narrative. Storytelling as a tool for knowledge transfer.

3) Lecturer and farmer community enterprise development and sharing of new knowledge all the time.

4) Lecturer and farmer community enterprise with interests and expertise in the subject.

5). Lecturer and farmer community enterprise has a good relationship with each other.

4. The key elements that contribute to learning. Should integrate the learning follows.

1) Time is of the first order. If the organization Community or family farmers, community groups, there is no opportunity to learn something new and do not have time to be creative. The transfer of knowledge by training farmers should not be held for several days because the mission of career and needed money to support his family. If several training days, farmers income losses and to cooperate less.

2). The stage area Discussions are used for conferences, seminars, etc., may be arranged by special interest groups. Working on the same or on a voluntary basis. This combination must have felt secure independent trust which will cause generosity to the generally popular management training by the middle of the village community hall. Or demonstration or learning center, depending on economic issues to the appropriate training, which must come together to jointly develop creative thinking.

3) Lecturer and farmer groups, community relations should be up to each other is to eliminate bias, ego mind was a blank. Do not stick with old or paradigm ever be able to put the skills to get a new speaker should be a learning experience for the farmers groups to learn gradually in five ways: 1). Learn much more I know a lot of 2) even more to overtake. 3) Even more discerning class 4) learn much more. The more progressive and 5) the student lot. The Social Development
Suggestions for further research.

1. The transfer of knowledge to the research community and research capacity building, community enterprise based on the sufficiency economy philosophy for Agriculture in Surin. Ram and Si in this study broadly in 20 of the next time should delve into detail on the issue, the issue of farmers' groups, community interests and development needs, such as the production of rice Jasmine making pig pit weaving. Mudmee Food preservation and processing products, etc.

2. Carefully study the factors that promote effective community of farmers who produce vegetables and other professionals.

3. Should the transfer of technology, design and packaging of products from the community.

4. Carefully study the factors that affect the success of product marketing community.

5. Should the transfer of intellectual community of scholars.

6. Education Empowerment to strengthen the community.

7. Should the knowledge management community sustainability.

8. Education should develop community enterprises Buddhist way.

9. Carefully study the organization of learning communities, using community-based learning.

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7. References


Initial Cash Flow for Commercial Culture of Thai Fairy Shrimp from Water Discharge of Striped Catfish Pond in Amphur Chumsaeng, Nakhon Sawan.

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Abstract

The study on initial cash flow for commercial culture of Thai fairy shrimp Branchinella thailandensis Sanoamuang, Saengphan and Murugan using water discharge from striped catfish pond was aimed to investigate production cost, profit and payback period of culturing Thai fairy shrimp by using water discharge of striped catfish ponds. Data were collected from the striped fish farmer in Amphur Chumsaeng, Nakhon Sawan province between October 2013 and May 2014.

A trial on commercial culture of Thai fairy shrimp using water discharge from striped catfish pond fed the fish by pellets was undertaken. Nylon cages were laid into the fish pond, pumping water from the fish pond into the cage at night about 10 hours. The density of commercial culture was 10 individuals/ litre and the period of culture was 15 days. As a result, production of Thai fairy shrimp culturing for 15 days in a cage was 961.01±32.70 g wet weight/ton. Initial cash flow for commercial culture of Thai fairy shrimp in 2 cages (6x3x0.5m³) was 19,000 Baht, and the cost of production per crop (15 day) was 3,207.42 Baht. If revenue of Thai fairy shrimp is 300 Baht/kg, the profit for selling Thai fairy shrimp per crop will be 1,928.58 Baht and the payback period will be 60 days or four culturing cycles.

Keywords: commercial production, profit, payback period, Thai fairy shrimp

1. Introduction

Branchinella thailandensis Sanoamuang, Saengphan, and Murugan, 2002 or Thai fairy shrimp (Figure 1) have been found in the northern part of Thailand since 2000 (Sanoamuang et al., 2002). Life history, the method of optimal egg hatching and mass culture of this species have been studied (Saengphan et al., 2005; Boonmak et al., 2007; Dararat et al., 2011). Thai fairy shrimp can be served as live feed for freshwater aquatic animals such as prawns, shrimp, and ornamental fish (Sanoamuang, 2005; Sriputhorn and Sanoamuang, 2011) because of its higher nutritional value than other common freshwater food resource such as Daphnia and Artemia(Dararat et al., 2012). The Thai fairy shrimps is considered as a high fecundity producing >4,000 cysts per female during a life span of 1 month culture period, and it is easily cultured. Fairy shrimps are non-
selective filter feeders. Various food sources, both live and inert, have been used successfully for culturing Thai fairy shrimps from nauplii to adults (Saengphan and Sanoamuang, 2009). The possibility of culturing Thai fairy shrimp by using water discharge from striped catfish pond have been studied (Srinoparatwatana et al., 2013).

NakhonSawan is a province in the lower north of Thailand which there is the highest culture units and area of fish farm (having product) in the north of Thailand around 19,402 rai in 2013 and most of them is pond culture. NakhonSawan is also one of the most of striped catfish producer in Thailand. Water discharge from striped catfish ponds contain phytoplanktons and organic matters which can be used for feeding Thai fairy shrimp. If the striped catfish fish farmers used water discharge of their farms to produce the secondary economic animals, their income will be increased. In this study, a trial experiments were conducted on commercial culture of Thai fairy shrimp using water discharge of striped catfish pond in AmphurChumsaeng, NakhonSawan in order to assess initial cash flow for commercial culture of this species.

2. Materials and Methods

Culture of Thai fairy shrimp

Cysts of Thai fairy shrimp were incubated in 5 l plastic containers with dechlorinated tap water. Nauplii which were hatched between 24-36 hours after incubation were used for experiments. Nylon cages (6x3x0.5m$^3$) were laid into the striped catfish pond, pumping water from the fish pond into the cage at night about 10 hours (Figure 2). The density of commercial culture was 10 individuals/ liter and the period of culture was 15 days.

Figure 1 Thai fairy shrimp (*Branchinella thailandensis*) female (left) and male (right)

Figure 2 Nylon cages for culturing Thai fairy shrimp using water discharge of striped catfish pond
Break-even analysis

Break-even point = Fixed cost / (Revenue – Variable cost)

3. Results and Discussion

The production of Thai fairy shrimp (Figure 3) which fed by water discharge of striped catfish pond (details as described in the method) was 961.01±32.70 g/ton. The initial investments for preparing materials to culture Thai fairy shrimp in the 2 nylon cages (6x3x0.5m³) was 19,000.00 Baht as shown details in Table 1.

Table 1 Initial investments of materials to culture Thai fairy shrimp in the nylon cages laid into the striped catfish pond

<table>
<thead>
<tr>
<th>Items</th>
<th>Cost (Baht)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Investments of 2 nylon cages (6x3x0.5 m³)</td>
<td>11,500.00</td>
</tr>
<tr>
<td>2. Water pump 2 inches</td>
<td>4,000.00</td>
</tr>
<tr>
<td>3. Plastic tank 500 liter (for nursing nauplii)</td>
<td>2,500.00</td>
</tr>
<tr>
<td>4. Thai fairy shrimp cysts</td>
<td>1,000.00</td>
</tr>
<tr>
<td><strong>Total initial Investments</strong></td>
<td><strong>19,000.00</strong></td>
</tr>
</tbody>
</table>
If lifetime of nylon nets are 2 years and the culture cycle was 12 times a year, so this nylon nets will be used for 24 times. The amortized cost of fixed cost for materials will be 19,000.00/24 = 791.67 Baht/cycle. The average production of Thai fairy shrimp for 2 nylon cage per cycle will be 17.3 kg (6x3x0.5x2x961.01). If sale price is 300 Baht/kg, fish farmers will have revenue 5,190.00 Baht per cycle. Therefore, the profit per production cycle will be 1982.58 Baht (Table 2) which higher than the profit of culturing Thai fairy shrimp with Chlorella which was 274.00 – 399.00 Baht/ 6m² and sale price was 500 Baht/kg (Sanoamuang et al., 2009).

Table 2 Cost and profit of culturing Thai fairy shrimp in nylon cages laid into the striped catfish pond

<table>
<thead>
<tr>
<th>Items</th>
<th>Cost (Baht)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue from Thai fairy shrimp production (17.3x300)</td>
<td>5,190.00</td>
</tr>
<tr>
<td>Amortized cost of fixed cost</td>
<td>791.67</td>
</tr>
<tr>
<td>Variable cost</td>
<td>2,415.75</td>
</tr>
<tr>
<td>- Labor cost (150x15 days)</td>
<td>2,250.00</td>
</tr>
<tr>
<td>- Electricity (0.4x10x15x2.76)</td>
<td>165.75</td>
</tr>
<tr>
<td>Total cost for a production cycle</td>
<td>3,207.42</td>
</tr>
<tr>
<td>Profit for a production cycle</td>
<td>1,982.58</td>
</tr>
</tbody>
</table>

Cash inflow of a production cycle for culturing Thai fairy shrimp by using water discharge of striped catfish pond is 5,190.00 Baht. Consequently, cash collection for 4 production cycles will be 20,760.00 Baht. Due to initial investments is 19,000.00 Baht, hence payback period will be equal to 4 production cycles or 60 days.

Break-even point for culturing Thai fairy shrimp by using water discharge of striped catfish pond will be 4.94 kg [791.67 / (300-139.64)] or sale price at 1,482.00 Baht.

4. Conclusions
1. The initial investments for culturing Thai fairy shrimp from water discharge of striped catfish pond was 19,000.00 Baht.
2. Cost of a production cycle (15 days) was 3,207.42 Baht.
3. If sale price is 300 Baht/kg, profit for a production cycle will be 1,982.58 Baht.
4. Payback period for culturing Thai fairy shrimp from water discharge of striped catfish pond was 60 days.
5. Break-even point for culturing Thai fairy shrimp by using water discharge of striped catfish pond was 4.94 kg or sale price at 1,482.00 Baht.
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6. References


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Abstract

Fe doped TiO2 nanoparticles were prepared by wet-impregnation method. The photooxidation of methylene blue occurred in a home-made photoreactor. Effects of %Fe dopant loading, amount of TiO2 catalyst, pH and irradiation time were studied. During the photodegradation reaction, the concentration of methylene blue was recorded using UV-Vis spectrophotometer. The results showed that the irradiation time for 150 min with 3wt%TiO2 doped with 3 wt% under pH 10.5 was attributed to the maximum photodegradation of methylene blue at 90%. The experimental results indicated that Fe doped TiO2 nanoparticles having an effective of photodegradation process which considered a promising new photocatalysts for the treatment of synthetic dye contaminated wastewater.

Keywords: TiO2; Fe dopant; photocatalytic; methylene blue

1. Introduction

In recent years, the increased use of synthetic dyes in the textile industry has lead to cause severe pollution problems due to the highly color, toxicity and carcinogenic nature [1-3]. Several techniques are applied to eliminate these synthetic dyes from water resource such as chemical precipitation, electrochemical technique, sedimentation, ion-exchange and photocatalytic process [2,4]. Among them, photocatalytic process has been applied for dye contaminated textile industrial as high efficiency and cost-effective technique.

Titanium dioxide (TiO2) is the most widely used as catalyst for photocatalytic reaction that can exhibit high catalytic activity, chemical stability and nontoxicity [5,6]. However, the limitation of practically used of TiO2 depends on the relatively wide band gap energy (about 3.2 eV for anatase TiO2), which can only absorb UV light. Moreover, the high recombination rate of electron-hole often results in decrease its photocatalytic activity [7,8].

Many attempts have been studied to expand the photoresponse of TiO2 to visible light activity by doping with metal oxides such as iron, zinc, vanadium and others [8,9]. In recent year, an enormous interest has been incorporated Fe ions in TiO2 to increase photocatalytic activity [2,8]. Fe ions play a very important role in the absorption response and retarding the electron-
hole recombination and thereby increase the photocatalytic activity of these composite photocatalysts [2,8].

In this work, the degradation of methylene blue (MB) were investigated using Fe doped TiO$_2$ nanoparticles under visible illumination. The effect of %Fe dopant loading, amount of TiO$_2$ catalyst, pH and irradiation time was studied.

2. Experimental

2.1 Materials

All chemical used were analytical grade and used without further purification.

2.2 Catalyst preparation and characterization

Pure TiO$_2$ and Fe doped TiO$_2$ nanoparticles (1, 3 and 5 %wt. Fe) were synthesized and characterized according to previous studied [10-11]. The obtained TiO$_2$ and Fe doped TiO$_2$ nanoparticles contained 100% anatase phase with the specific surface area of bare TiO$_2$, 1%wt. Fe/TiO$_2$, 3%wt. Fe/TiO$_2$ and 5%wt. Fe/TiO$_2$ at 51.11, 56.82, 75.50 and 66.23 m$^2$g$^{-1}$, respectively.

2.3 Photocatalytic activity testing

Experiments were carried out in a homemade photoreactor under visible illumination [10-11]. A different dosage of TiO$_2$ (1, 2, 3, 4 and 5 wt%) or composite catalysts (1, 3 and 5wt% Fe dopant) was mixed with 10 mgL$^{-1}$ methylene blue was subjected to visible illumination. Typically, the mixed suspension was maintained for 15 min in the dark condition to establish to equilibrium adsorption/desorption. The concentration of methylene blue was investigated by UV-Vis spectrophotometer at 30 min time intervals. Control experiment was also studied in the absence of methylene blue or using pure TiO$_2$ to clarify the effect of illumination. All experiment was studied the effect of amount of TiO$_2$ catalyst, %Fe dopant loading, pH and irradiation time.

3. Results and discussion

3.1 Photocatalyst activity

Photodegradation experiment was conducted under visible irradiation (400 Wm$^{-2}$) of A different dosage of TiO$_2$ (1, 2, 3, 4 and 5 wt%) was investigated the optimal amount of 10 mgL$^{-1}$ methylene blue. The UV-Vis absorption spectra with the increasing of TiO$_2$ dosage is shown in Figure 1. In the absence of TiO$_2$ catalyst, the photoactivity was almost no degradation of methylene blue than all those catalyst. The photoactivity increased when TiO$_2$ was added to methylene blue solution from 1-3 wt% was about 82% in the case of 3 wt% TiO$_2$ and further decreased to 50.67 and 53.53% at 4 and 5wt% TiO$_2$ catalyst, respectively. The possible explanation is involved with the concentration of catalysts that low concentration of TiO$_2$ provide less OH$^-$ radical formed on the surface of TiO$_2$. So the oxidizing agent decreases with low amount of catalyst. The reversed effect is observed with the increasing the amount of TiO$_2$ since increasing in TiO$_2$ lead to inhibit the light penetration.
3.2 Effect of Fe dopant

The photocatalytic degradation of $1.0 \times 10^{-5}$ mol/L was carried out on 3wt%TiO$_2$ with different percentage of Fe dopant (1, 3 and 5wt%). Figure 2 depicts the absorption spectra of 3wt%Fe/3wt%TiO$_2$ that showed the most efficiency within 150 min. The photoactivity increased up to 3wt%Fe/TiO$_2$ composite catalysts followed by decrease in activity of 1 and 5 wt% that remarkable higher activity compared with bare TiO$_2$. The significantly enhanced photocatalytic of TiO$_2$ decorated with Fe$^{3+}$ and also depending on its contents. At low Fe$^{3+}$ concentration, Fe$^{3+}$ ions act as $e^+/h^+$ trap, which inhibit $e^+/h^+$ recombination. Meanwhile, Fe$^{3+}$ ions act as recombination $e^+/h^+$ at high Fe$^{3+}$ content [2]. Moreover, the increasing in Fe$^{3+}$ can be attributed to increases in surface area, reduction in band gap energy which in turn shifting the absorption spectra to the visible region. In addition, more OH· generated from Fe$^{3+}$ could accelerate the photoactivity process.

3.3 Effect of pH

In comparison with pH effect on methylene blue photoactivity, alkaline condition shows a higher photoactivity under visible irradiation. The removal of methylene blue under proper conditions is demonstrated in Figure 3. The efficiencies of Fe$^{3+}$/TiO$_2$ were found to range in following order: alkaline > neutral > acidic. These results are consistent with the report by Theerakarunwong [11]. Since the negatively charge was observed on TiO$_2$ surface under alkaline condition, which leads to methylene blue adsorption. In contrast, the photocatalytic activity
decreases at acidic and neutral media due to acidic solution retarding methylene blue adsorption [5].

![Figure 3. The effect of pH on methylene blue degradation.](image1)

### 3.4 Effect of irradiation time

Figure 4 shows the decrease of methylene blue on Fe$^{3+}$/TiO$_2$ photocatalyst under visible exposure. About 90% degradation of methylene blue is achieved within 150 min. photocatalytic activity of methylene blue at lower exposure time cause lower efficiency whereas the degradation performance is higher upto 150 min and stable.

![Figure 4 The effect of irradiation time on methylene blue degradation.](image2)

To evaluate the possibility of remediation of methylene blue contaminated wastewater from textile industry, the photoactivity of 3 wt%Fe/TiO$_2$ was carried out (Figure 5). It is observed that the degradation of the dye increases upto 210 min reaction time and keep stable. The lower efficiency (65%) of 3 wt%Fe/TiO$_2$ can be caused by more than methylene blue would absorbed and also the matrix in wastewater was vary depended on the process of factory used.
4. Conclusion

The photocatalytic degradation of methylene blue under visible irradiation was conducted using Fe/TiO$_2$ nanoparticles in a home-made photocatalytic reactor. The amount of Fe dopant leads to an increase in degradation of methylene blue. The 3%wt TiO$_2$/3wt%Fe dopant showed the highest photoactivity. The results demonstrated that Fe doped TiO$_2$ catalyst is a good alternative light source for using solar light which contained only 2-3% UV. Further studies on the understanding of toxic from nano-catalyst residue contaminated after degradation process.

5. References


The Development of Virtual Classroom by Thinking Process for Data Structure and Algorithm

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Abstract

The purpose of this research were 1) to develop teaching and learning system through virtual classroom to practice thinking skills in algorithm and information structure course 2) to find the efficiency of teaching and learning system through virtual classroom to practice thinking skills in algorithm and information structure course 3) to find the learners’ achievement before and after having been taught with teaching and learning activities through virtual classroom to practice thinking skills in algorithm and information structure course. The contents of the experiment are as follow; 1) information structure type Array 2) information structure type Stack 3) information structure type Queue. The samples are 30 student, program in Information System and Software development. They are derived by purposive sampling.

The result found that the development of teaching and learning system through virtual classroom to practice thinking skills in algorithm and information structure course has the efficiency as 81.67/84.89 which was met the criteria 80/80 and the experts agreed that teaching and learning system through virtual classroom to practice thinking skills in algorithm and information structure was appropriate in very good level (x = 4.15, s.d. = 0.57) The achievement of students after having been taught with virtual classroom to practice thinking skills in algorithm and information structure was in well virtual classroom to practice thinking skill in algorithm and information structure was in well progress and higher level of acquitting. Student’s attitude toward the using of the system was in good level (X = 4.51)

Keywords: Development, virtual classroom, algorithm, learning system

1. Introduction

Thailand National Education Act of B.E.2542 which has the effect of teaching and learning more by the ambitions and the key is to manage the study must be to develop the Thai people to a full human both body and intellectual knowledge alongside morality and culture in life can be shared with other people in the happy and from research on the teaching of the Higher Education Level: the development of the learning process in the bachelor degree study the condition and issues related to the teaching of Thailand found that the condition of the Teaching Focus on learning from the classmates and the teaching model that focuses on the learning from the source learn the problems of teaching in the undergraduate level in the is
the teaching found that the Teaching Model is often the Teaching Model describing how to use the transfer of knowledge is not taking techniques to make a focus on the learn by heart can not establish a love to learn the learner found that the learner lack of skills and experience in research lack of skills to write a sort of English. Course found that there is no integration of the course so that the students have the knowledge in the field of study, but the learner to specific locations on the material found that the library does not modern can not be a gallery of sufficient knowledge of the faculty to find more knowledge. The management found that the assessment of the teaching in a university is not possible because the principles of each of the University of mobile phones for freedom and academic freedom from the issue described above is the most important reason is that drives the education in the Higher Education Level must be reformed the Quality Tools teachers technology and academic research, accelerate the development of the teaching focus on training students to learn manually recognize as a problem solving with disciplinary action up on training by operating should bring the process of the quality and standard of education to use as soon as the trend of teaching is to use the Group to learn to learn together to learn and to learn to open with the development and teaching by the application to teach such as to learn flexibility and long-distance The Teaching Model to promote the problem solving, teaching and research in the scientific through the network the World Wide Web.

Pansak Polsaram (2543) baseline has said that the learning to develop the skills of the learner is very important to manage the study to have a quality in the development of the quality of the Intellectual Ethics values and are good citizens of the country, there must be a learning experience with the value to the learner that will achieve it must be designed to learn with the performance as a result to the development of the learner to think as good ideas in Thai society that Thailand should focus on the school to develop the quality of thought process is a process is important to teach them to think it is a problem and is from a meeting of educators from different countries at the wingspread conference center in racine, wisconsin state to find ways to develop the skills to think of children found that the guidelines that educators use to do research and try to develop the thinking is 3. The Guidelines is the teaching model to think about the Teaching Model to teach about the ideas that are suggested that in the teaching should take the technology to participate as a tool for the development of the skill practice as the Building Block Building Block media or the lesson finished activities for the virtual classroom is an Innovation in Education at Educational Institutions around the world are paying attention and expand more options

Kanchit Malaivongs (2552) to say the meaning of the virtual classroom that the learning through a computer network that links your computer to the web service may be a link close-up, or remotely through the communication system and the Internet coaching process the instructor will design the system of teaching by the activities of the teaching media presentation via a web site regularly subjects to create web pages in each section to complete the learner will access to the web site regularly subjects and perform the lesson.
Rajamangala University of Technology Isan, Sakon Nakhon Campus, is a management system to teach undergraduate level with network the Internet can be students to research the manually. But most of the teachers do not have teaching materials that support the dear over the Internet so that the Investigator is the development of the system of teaching through the virtual classroom to practice the skills so that students feedback as a and solve the problem is with the terminology and the data structure and algorithms because the terminology is the content is to think the intellectual property and to encourage students to recognize the research to find the knowledge to self-discipline is the responsibility of the role to power of the nation.

The purpose of the research project to the development of virtual classroom by thinking process for data structure and algorithm to find the system performance of the teaching through the virtual classroom to practice the skills of coursework the data structure and algorithms to find the results of the study of the learner between the before and after the lesson with the system of teaching through the virtual classroom to practice the skills of coursework the data structure and algorithms

2. Methodology

1. Population and Samples

Population is the students at the School of Business Administration Academic Program Information systems and software development, University of Rajamangala campuses in the northeast region of Sakon Nakhon is the subject the students the information system on your computer and the developer of the software that is register in the academic year 2012 selected by the way of the specific 30 people

2. Hypotheses

2.1 performance of your system of teaching through the virtual classroom to practice the skills of coursework the data structure and algorithm that have a value that is greater than or equal to the criteria that define at least 80/80

2.2 learner with a system of teaching through the virtual classroom to practice the skills of coursework the data structure and algorithms have the outcomes of the higher the statistical significance 0.01

3. Variable

The variable is a system of teaching through the virtual classroom to practice the skills of coursework the data structure and algorithms

The dependent variable is performance based on criteria E1/e2 outcomes of the study

4. Research Tools

4.1, the system of the teaching through the virtual classroom to practice the skills of coursework the data structure and algorithms
4.2 evaluate the performance of the system of teaching through the virtual classroom to practice the skills

4.3 Exam Results of the study the terminology and the data structure and algorithms

5. Data Collection

5.1 steps to perform the trial research study trial by manually experiment with in business administration program of study information systems and software development years 3 of 30 people are as follows: more than

5.1.1 explained to allow students to understand the process of teaching by using a system of teaching through the virtual classroom to practice the skills of coursework data structure that developed more than.

5.1.2 tested before the dear (pre-test) by using the test results of the study, which this quiz covering all the objectives of the unit to learn after the subject has been completed to review to evaluate the score before than

5.1.3 perform the learning process with a system of teaching through the virtual classroom

5.1.4 to test after the dear (post-test) by using the test results to the dear old.

5.1.5 Intentional gather all the information and analysis by the Statistical methods more than.

5.1.6 Intentional access a summary of the results of the study.

5.2 duration of the collected data in the trial to manage learn by using a system of teaching through the virtual classroom to practice the skills of coursework the data structure and algorithms the investigator is set the duration of the trial and storage is a 2/2555

6. Data Analysis and Interpretation

6.1 analyze the results of the Quality Evaluation System of learning through virtual classroom to practice the skills of coursework the data structure and algorithms by expert of 3 analysis of the level of using the statistics mean and standard deviation in the analysis is the average compared to the evaluation criteria as follows (Pisutta Arreeraad, 2551 : 143-151)

\[
4.51-5.00 = \text{most beneficial} \\
3.51-4.50 = \text{very beneficial} \\
2.51-3.50 = \text{average} \\
1.51-2.50 = \text{less beneficial} \\
1.00-1.50 = \text{the least beneficial.}
\]

6.2 analyzed for the performance of the system of teaching through the virtual classroom to practice the skills of coursework the data structure and algorithms

The performance of the system of teaching refers to the ability of the system to the teaching to create the outcomes the learner has the ability to take a quiz during the lesson exercise or the exam After the lesson, achieving the objectives in a threshold (Monchai Thainthong, 2548: Page 201-202)

Efficiency = $E_1/e_2$
When the
\[ E_1 = \text{the average score of the students from all the quiz of the lesson.} \]
Each kit
\[ E_1 = \text{the average score of the students from all the quiz after the lesson (posttest)} \]

6.3 Achievement test

Outcomes are the results of the work according to the target set in the objectives are guidelines for assessment for the action with a group of one example 2 How is 1. Compare before and after the trial. 2) to compare the experiment with the specified criteria such as the comparison results the average, for example after the education with the lesson computer and perform the learner to have the results of the study is higher than the average level of 3.50 (Monchai Thainthong, 2548: Page 207-208)

6.3.1. Statistics for Achievement test

6.3.1.1 Validity

By using the formula index consistency between test with purpose by using the formula value Item objective congruence index : IOC The questions that obtain the IOC between 0.5 – 1.0 were deemed acceptable

\[ \text{IOC} = \frac{\sum R}{N} \]

When
+ 1 means the question is congruent with the objectives
0 means the question is uncertain to be congruent with the objectives
- 1 means the question is not congruent with the objectives

6.3.1.2 Difficulty.
The difficulty to use. It is between 0.20 - 0.80

6.3.1.4 Reliability

The Reliability for interpreting the confidence is as follows: (Reference Cited Kiatsuda Srisuk, page 144).

0.00 - 0.20, means the lowest
0.21 - 0.40 means low
0.41 - 0.70 means moderate
0.71 - 1.00 means high

6.3.1.5 Statistics for the pre-test and post-test by test critical value, (t-test) - dependent sample (Kanchana Watthayu, 2548).

\[ T = \frac{\sum D}{\sqrt{n \sum D^2 - (\sum D)^2}} \]

Where the df = N-1 and N refers to the number of pairs of scores.

6.3.2 Setup Procedure to create a quiz measure outcomes of the courses. The data structure and algorithms

6.3.2.1 Study of curriculum.
6.3.2.2 Analysis of the purpose to teach the lanyard to the course and a description of the courses.

6.3.2.3 Create quiz measure outcomes of the class to cover the content as defined in the course by creating a multiple choice, select Reply 4 options have the correct answer only one answer the number of 30

6.3.2.4 Take the quiz to create an expert to verify the match (Content Validity) consistency between content with the purpose and the accuracy of the language used to improve.

6.3.2.5 Record the result of the consideration to the opinion of the experts in each of the content in each of the and then find the total score the opinions of all the experts as the and find the index of consistent (IOC) test with the purpose of behavioral (Bunchom Sisa’at, 2545) (the index the consistency between the test with the purpose of the calculated \( \geq 0.5 \) indicates that a test consistent with the purpose if the index of the calculated \( < 0.5 \) indicates that the test is not consistent with the purposes).

6.3.2.6 Take the quiz has been revised to try out (try with students program the system of Bangladesh on the computer - Software Development semester 2 / 2555 of 20 people

6.3.2.7 Scores from the try out to analyze the test of the value for easy (P), the power to recognize (r), and the confidence of the whole of the way of a ladder Richardson by using the formula (Luan Saiyos et.al, 2543)

6.3.2.8 Selection of a test measures the results of the study in the number of 30 article Create a test of the complete to apply to the actual test to the subject.

3. Results

This research the investigator has The Development of Virtual classroom by thinking process for data structure and algorithm for students in Business Administration program of study the information system to appear the results of the data Analysis and Interpretation are follows:

The results of the Quality Evaluation System of learning through Virtual classroom by thinking process for data structure and algorithm with experts of 3, the results of the assessment of the quality of the classroom through the Virtual classroom by thinking process for data structure and algorithm. Shown in Table 1.

Table 1 Shows the results of the Quality Evaluation System of learning through Virtual classroom by thinking process for data structure and algorithm

<table>
<thead>
<tr>
<th>Review Section</th>
<th>Level</th>
<th>S.D.</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>( \bar{X} = 4.53 )</td>
<td>0.58</td>
<td>most beneficial</td>
</tr>
<tr>
<td>Graphics and design</td>
<td>( \bar{X} = 67 )</td>
<td>0.58</td>
<td>most beneficial</td>
</tr>
<tr>
<td>Technical Support</td>
<td>( \bar{X} = 4.33 )</td>
<td>0.56</td>
<td>very beneficial</td>
</tr>
<tr>
<td>The average total</td>
<td>( \bar{X} = 4.51 )</td>
<td>0.57</td>
<td>most beneficial</td>
</tr>
</tbody>
</table>
Table 1 The results of the Quality Evaluation System of learning through the virtual classroom by thinking process for data structure and algorithm and 3 is the content of graphics and design technical support with average level is most beneficial ($\bar{X} = 4.51$, SD = 0.57).

More than the system performance of the teaching through the virtual classroom to practice the skills of coursework the Data Structure and Algorithm from the learner can take the quiz between the lesson post-test which are the result Table 2.

Table 2 shows the results of system performance of the teaching through through the virtual classroom by thinking process for data structure and algorithm

<table>
<thead>
<tr>
<th>The Criteria</th>
<th>Total</th>
<th>The average score</th>
<th>The percent value</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1.</td>
<td>30</td>
<td>24.50</td>
<td>81.67</td>
</tr>
<tr>
<td>E2.</td>
<td>30</td>
<td>25.45</td>
<td>84.89</td>
</tr>
</tbody>
</table>

Table 2 The results of the system performance of the teaching through through the virtual classroom by thinking process for data structure and algorithm Performance 81.67/84.89 that is higher than the criteria that is 80/80 by test scores during the lesson is the percent value 81.67 and post-test is the percent value 84.89

More than more than the investigator. scores pre-test and post-test of the 30 students from the teaching model with a system of teaching through the virtual classroom by thinking process for data structure and algorithm to calculate by statistics t-test (dependent). Set the level Statistical Significance level .05 when calculating the statistics student. The Investigator. Open the t-value from the table and apply the t-value from the calculation and from the table is compared to test the hypothesis by assumes the following:

H0 : The average score pre-learning students are not higher than before

H1 : The average score post-learning of the Students is higher than before

Table 3 Shows the results of the study of a subject from the study the Classroom through the virtual classroom by thinking process for data structure and algorithm found the pre-test and post-test of the students are the average score equal to 12.10 and 24.63 when the comparison between the pre-test and post-test found that the exam scores after the student higher than before the dear when analyzing the statistics values with the analyze statistical computer from the calculations for t - test can be concluded that the results of the study before using the system of teaching through the virtual classroom by thinking process for data structure and algorithm and after use is different at a significant by the after the use of the
classroom through the virtual classroom to practice the skills of coursework the data structure and algorithms students studying in the higher the statistical significance level of 0.05.

Review

This research the investigator has The Development of virtual classroom by thinking process for data structure and algorithm for students in Business Administration program of study the information system to appear the results of the analysis and interpretation in this research following:

1. The results of the Quality Evaluation System of learning through the virtual classroom by thinking process for data structure and algorithm and 3 is the content of graphics and design technical support with average level is most beneficial ($\overline{X} = 4.51$, SD = 0.57).

2. The results of the system performance of the teaching through through the virtual classroom by thinking process for data structure and algorithm Performance 81.67/84.89 that is higher than the criteria that is 80/80 by test scores during the lesson is the percent value 81.67 and post-test is the percent value 84.89

3. The results of the study of a subject from the study the Classroom through the virtual classroom by thinking process for data structure and algorithm found the pre-test and post-test of the students are the average score equal to 12.10 and 24.63 when the comparison between the pre-test and post-test found that the exam scores after the student higher than before the dear when analyzing the statistics values with the analyze statistical computer from the calculations for t-test can be concluded that the results of the study before using the system of teaching through the virtual classroom by thinking process for data structure and algorithm and after use is different at a significant by the after the use of the classroom through the virtual classroom to practice the skills of coursework the data structure and algorithms students studying in the higher the statistical significance level of 0.05.

4. This results in accordance with the assumptions and in accordance with the objectives that the Investigator is set.

4. Conclusion

1. The results of the Quality Evaluation System of learning through the virtual classroom by thinking process for data structure and algorithm and 3 is the content of graphics and design technical support with average level is most beneficial ($\overline{X} = 4.51$, SD = 0.57).

2. The results of the system performance of the teaching through through the virtual classroom by thinking process for data structure and algorithm Performance 81.67/84.89 that is higher than the criteria that is 80/80 by test scores during the lesson is the percent value 81.67 and post-test is the percent value 84.89

3. the results of the study of a subject from the study the Classroom through the virtual classroom by thinking process for data structure and algorithm found the pre-test and post-test of the students are the average score equal to 12.10 and 24.63 when the comparison between the pre-test and post-test found that the exam scores after the student higher than before the
dear when analyzing the statistics values with the analyze statistical computer from the calculations for t-test can be concluded that the results of the study before and after use is different at a significant the skills of coursework the data structure and algorithms students studying in the higher the statistical significance level of 0.05.

5. Acknowledgment

This research is the capital support to research from the Rajamangala University of Technology Isan. B.E.2555 Thank You for the management and all related you to research done by the request to thank the students program of study information system that cooperation in the trial lessons learned in the Research in This and the cooperation in the Research Project in this success

This last of the investigator hope that this would be useful more or less. For those interested in as well as the related if there is nothing lacking or there is an error of any of the investigator shall receive feedback with pleasure.

6. References


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The Integration Curriculum Development for Enhancing the Competency Holistically Integrative Researchers of Learning Substance Group Basic Educations School in Surin Province

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Abstract

The purpose of this research were as follows: 1) to construct and find an efficiency of the Integration Curriculum Development for Enhance Competency Holistically Integrative Researchers of learning Substance Group Basic Educations Education School in Surin Province at the 80/80 standardized criterion efficiency, 2) to find the effectiveness index of the Integration Curriculum Development for Enhance Competency Holistically Integrative Researchers of learning Substance Group Basic Educations Education School in Surin Province, 3) to compare pre-test scores and post-test scores all lessons, 4) to study the satisfaction of the Integration Curriculum Development for Enhance Competency Holistically Integrative Researchers of learning Substance Group Basic Educations Education School in Surin Province, 5) to study the attitude of the Integration Curriculum Development for Enhance Competency Holistically Integrative Researchers of learning Substance Group Basic Educations Education School in Surin Province, and 6) to find the retention of the Integration Curriculum Development for Enhance Competency Holistically Integrative Researchers of learning Substance Group Basic Educations Education School in Surin Province. The two hundred teachers are on purposive sampling selected from teachers Substance Group Basic Educations Education School in Surin Province. This research conducted during year 2013-2014.

The instruments used for gathering data were : 1) the development of the Integration Curriculum Development for Enhance Competency Holistically Integrative Researchers of learning Substance Group Basic Educations Education School in Surin Province was conducted, 2) the
achievement test consists of 90 multiple-choice questions with index of difficulty from 0.36-0.77, discrimination from 0.21-0.35, with the reliability of test was 0.83. 3) A satisfaction questionnaire with a five-level scale, reliability of questionnaire value of 0.85. The statistical procedures employed in the data analysis included percentage, mean, standard deviation, t-test.

The results of the study were follows:

1) An efficiency of the Integration Curriculum Development for Enhance Competency Holistically Integrative Researchers of learning Substance Group Basic Educations Education School in Surin Province was 82.54/82.11 with higher than the 80/80 standardized criterion efficiency.

2) The effectiveness index of the Integration Curriculum Development for Enhance Competency Holistically Integrative Researchers of learning Substance Group Basic Educations Education School in Surin Province was 0.7246.

3) The results of the comparison of pre-test scores and post-test scores all lessons significantly different at 0.05.

4) The results of the satisfaction of the Integration Curriculum Development for Enhance Competency Holistically Integrative Researchers of learning Substance Group Basic Educations Education School in Surin Province was found to be a high level.

5) The retention of the teachers after join the class in the two weeks was no significantly different at 0.05.

Keywords: Integration Curriculum Development, Competency Holistically Integrative Researchers of learning Substance

1. Introduction

Education is paramount in order to help people develop the knowledge. Ability and is one of the factors that will drive the nation prosperous society in the future, and education is a social activity that is fundamental to the creation and accumulation of national power. Any nations with a strong social capital have good quality. The amount will depend on how much the education system and education is a process that has several components in order to bring the country to target desirable to develop human qualities. Education is essential that all countries must continue to take place in a systematic way to improve the quality and increase the population of the country in international competition, according to the National Education Act. Prof. 2542 has set the details of the education provided by many of the objectives and principles. The rights and obligations of the educational system of education. Resources and investment to education. Including educational technology which can be said to cover the necessary material content of current education (Education Act of 2542).

Teacher professional development reflects conditions that are important in the development of teachers as a teaching expertise, a key element of the course. In social learning, which requires new knowledge to cope with the complexities that face is. Teacher development
as a researcher, teacher or researcher (Teacher as Researcher) in the teacher’s role as a researcher. In a manner that will guide the work of teachers is basic research, ie research process can be used to manage learning in the classroom. While the teaching takes place. To seek practical solutions to improve teaching. Improve student learning or might be said. Teachers, researchers, who are two aspects of teaching (Two side of Teaching) is a coherence in the implementation of research activities in conjunction with instructional time. The process of creating knowledge and knowledge is the key to teaching and research combined. (Freeman.1998) teachers, researchers must be able to both teaching and research. To take action as the two come together in the same role. The process of teaching and research to create a process for teachers. The process of understanding what is happening to teaching and learning in the classroom. A knowledge that reflects an understanding of which is different from teaching in general.

Research is a learning process Teacher Education. Researching solutions to improve their teaching responsibilities. Teachers, researchers who help bridge the gap of knowledge of these. By practice, teaching and knowledge that occurs in a class by themselves. Taking into account the balance to the system. The structure of the class to acquire knowledge about teaching. The ability of teachers formed a research teacher performance. This is due to the work as a researcher who has studied the context of the classroom. Research is an important part of the process of teaching. The goal is to improve the learning of students in the class at the same time it is important for teachers to make their own history and look at the practice. Researchers, teachers, performance is a feature of the major pegs directly affects the development of the teaching quality and developing teachers’ performance standards, which deals with the discovery of documents and research reports point out that performance. Teacher researchers the performance consists of two parts, the association is. Performance of teaching and performing research (books Barratt had left. 2540: 120) Teacher Competencies researchers include key capabilities five areas: 1) the psychosocial research (Research Mind) 2) the pursuit of knowledge in a systematic way. (Systematic Inquiry) 3) of the learning and teaching (learner) 4) practice-oriented reflection (Reflective practice), and 5) the characteristics of teachers (teachers Personality).

For problems encountered in the development of teachers, researchers found that the current problems in both policy and management in school organization and collaboration between organizations. The problem of individual factors on the part of the vision of the administration and lack of understanding of the importance of academic development. The misconception that research and development of teachers teaching the same subject is not relevant. Teachers lack the motivation to adapt techniques for the learning process. Lack of learning and research consultant. The problems stemming from the curriculum development process and in the training of teachers, researchers or capacity building. There are problems in the process of development or training. And scaling effectiveness. The activity does not lead to the creation or implementation performance has habitually. Curriculum and teachers do not
focus on feature development, the researchers inserted into practice or course, other teachers did not learn the research process and cannot be applied. In light of the current circumstances, the course teacher in the undergraduate course in the present. With a focus on research methods and attributes, knowledge and attitudes, rather than focusing on the pursuit of knowledge. Curriculum and teaching. Not conducive to the development of teacher competencies researchers are not integrated and do not lead to a fundamental process research and development activities. But the emphasis on knowledge transfer instruction. The course, taught in separate research and teaching. Will focus on how knowledge. Model and its findings, which are not sufficient to lead to a job in the teaching profession.

Education Act of 2542, Section 4, Article 23 stipulates that education in the educational system. Non-formal education And informal education must emphasize the importance of knowledge, virtue, learning processes and integrate, as appropriate, at each level of education, and Section 24 (4) requires that. The teaching and learning by incorporating knowledge of various aspects of a balanced and cultivate virtue. Values are pretty good and desirable in all subjects. The intent of the Act, as discussed above. Can conclude that the instructor must be based integration. (Integration) in the curriculum. Because the study is intended to provide students with a man complete physical, mental, intellectual, knowledge, ethics and culture of life can coexist with other people happy, so learning it. The need for a holistic learning (holistic) or balanced (equilibrium) to help students learn how to integrate knowledge about life and the knowledge that the students get the meaning. Diverse and can be applied to practical use on a daily basis. Due to the integration of curriculum and instruction: 1) real-life stories of people who have a relationship with each other. Not separated from each other as any two) students will learn better and learn in a meaningful way. When integrated into real life by learning something close and then expand far away 3) the expansion of current knowledge. Expanding very fast with the new increased manifold. It is necessary to select a material essential to the learner at the same 4) courses are only of a single package and can be used to solve everything that happens in real life 5) subjects. and other similar or related. Should be linked to student learning in a meaningful way. Reduce duplication of content-oriented, reduce the time burden of teachers 6) provides an opportunity for students to apply their knowledge, ideas and skills that many. 7) The teaching relationship linking concepts from many disciplines together with many benefits, most importantly, contribute to knowledge transfer (Transfer of learning) for teaching integrated in. helps students connect what they have learned to real life, and in turn, they can link the classroom to a real life outside the classroom. The students understand that what they learn is useful to actually eight) curriculum and teaching integrated with the purpose of eliminating the duplication of the content of the curriculum 9) teaching integrated. Integration can respond to people’s ability to learn multiple languages such as Thailand, which has a mathematical space. The maneuverability of the body and the animated musical, social or interpersonal knowledge and self-understanding which is called multiple intelligences (Multiple Intelligence) and the response capabilities that would express the emotional response and 10) the teaching
process in curriculum integration. consistent with the theory of knowledge by students. (Constructivism)

From the current situation and the problems, the research was to study the development of an integrated capacity building training for teachers, researcher integrated, holistic learning of the basic school in Surin.

1.1 purpose
1. To create and develop integrated training to enhance teachers, researchers Integrative Holistic group learning of basic school in Surin with standards at 80/80
2. Effectiveness Index for curriculum development, integration, training, capacity building for teachers, researchers integrated, holistic learning of the basic school in Surin.
3. To compare the achievement integrated training courses to enhance teachers, researchers integrated, holistic learning of the basic school in Surin.
4. Satisfaction Study course development, integration, training, capacity building for teachers, researcher integrated, and holistic learning of the basic school in Surin.
5. To study the durability of learning, curriculum development, integration, training, capacity building for teachers, researchers integrated, holistic learning of the basic school in Surin.

2. Scope of Research

2.1 Population used in this research includes.
1. The population data used to study the basis for curriculum development consisting of teachers of basic education in Surin province in 1,000 and the five experts.
2. The population of the study course consists of basic education teachers in Surin 1, 2 and 3 400 people.
3. The population of this technology include teacher training to the personnel of the Office of Education in Surin 1, 2 and 3 400 people.

2.2 The sample, the sample used in this study was composed.
1. Samples
2. The samples used in the experiment consists of faculty, staff, curriculum consists of the Office of Education in Surin 1, 2 and 3 of 60.
3. The sample used to train teachers to include technology transfer, personnel of the Office of Education in Surin 1, 2 and 3 around 200 people.

2.3 Variation Study
1. The variable is integrated training courses to enhance teachers, researchers integrated, holistic learning of the basic school in Surin.
2. The dependent variable is
   1) Achievement learn.
   2) Process Skills Research
   3) Attitudes towards training.
3. Research Methodology

The purposive sampling was 180 people from academics, teachers, and educational personnel of basic school in Chumphon Buri, Surin Sukhaphum Sangkhasap center and Castle Centre Rattanaburi and Surin. The tools used in this study include: 1. Guide lecturer problems and the need for training. Content activity guide books on topics such as academic training 2. A training manual. There is a built structures covered in the course. 3. Guide books on topics such as technical training and media training activities, achievement and attitude test performance. 4. The researchers noted in the report. 5. The observer noted that the performance of the participants. 6. Evaluation training for assessment after completion of training. To assess the suitability of the course takes place in the training process. Data collection: 1) a letter asking for data collection, 2) planning to collect data to make an appointment to collect the data, 3) data collection operation as planned.

4. Results

The research findings are as follows.

1. Check the form of capacity building training to teachers, researchers integrated, holistic learning of the basic school in Surin. The results show that the suitability of curriculum integration, training, capacity building for teachers, researchers integrated, holistic learning of the basic school in Surin. The overall level, the first two items in the order of highest to lowest were: 1. To determine the content of each of (X = 4.57) have the most value. 4. The content of the course, followed by the actual implementation (X = 4.55) 3. Events and training courses in each subject (X = 4.52) 4. Learning content in each subject (X =. 4:51) 5. Course content (X = 4.49) 6. Outline of the scope of the training course (X = 4.48) 7. Learning materials that will be used to strengthen the knowledge (X = 4.48) 8. The aim of the course (X = 4.45) 9. Foster learning (X = 4.44) 10. In principle, of course, the actual implementation (X = 4.41) 11. Sorting out the content of each course. (X = 4.41) and 12. The duration of the training (X = 3.61), respectively.

2. To evaluate the consistency of the program.
The results found that consistency of curriculum integration training to enhance teachers, researchers integrated, holistic learning of the basic school in Surin. The ranged from 0.80 to 1.00, sorted by topic below. 1) The problem, of course, the aim of the course. 2) The difficulty of the course with behavioral objectives of the course. 3) The problem, of course, the content of the course. 4) The problem, of course, the topic of training. 5) The aim of the course with behavioral objectives of training courses in each subject. 6) The aim of the course content of the course.7) the aim of the course on the topic of training. 8) Behavioral objectives and content of training courses in each subject. 9) Training course on the topic of training. 10) In the behavioral objectives of training activities and training methods. 11) In subjects with objective behavioral evaluation. 12) Behavioral objectives of training in the evaluation. 13) The content of training courses on the topic with the media. 14) The content on the topic of the evaluation. 15) Activities and training on the topic of media and 16) activities and training on the topic of the evaluation.
3. Results curriculum integration, training, capacity building for teachers, researchers integrated, holistic learning of the basic school in Surin.

Table 1 compares the achievement of curriculum integration, training, capacity building for teachers, researchers integrated, holistic learning of the basic school in Surin.

<table>
<thead>
<tr>
<th>Test</th>
<th>n</th>
<th>X</th>
<th>SD</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>30</td>
<td>71.30</td>
<td>4.27</td>
<td>8.624</td>
</tr>
<tr>
<td>Posttest</td>
<td>30</td>
<td>81.70</td>
<td>4.27</td>
<td></td>
</tr>
</tbody>
</table>

* P<.05

Table 1 showed that the achievement of curriculum integration, training, capacity building for teachers, researchers integrated, holistic learning of the basic school in Surin by statistical significantly at level 0.05.

Table 2 outlines the suitability of curriculum integration, training, capacity building for teachers, researchers integrated, holistic learning of the basic school in Surin of 5 experts.

<table>
<thead>
<tr>
<th>Test</th>
<th>n</th>
<th>X</th>
<th>SD</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>5</td>
<td>50.0</td>
<td>0.70</td>
<td>18.50</td>
</tr>
<tr>
<td>Posttest</td>
<td>5</td>
<td>57.60</td>
<td>0.54</td>
<td></td>
</tr>
</tbody>
</table>

* P<.05

Table 2 outlines the suitability of curriculum integration, training, capacity building for teachers, researchers integrated, holistic learning of the basic school in Surin. Suitable

Table 3 compares the attitudes towards integrated training courses to enhance teachers, researchers integrated, holistic learning of the basic school in Surin.

<table>
<thead>
<tr>
<th>Test</th>
<th>n</th>
<th>X</th>
<th>SD</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>30</td>
<td>78.53</td>
<td>2.70</td>
<td>27.836</td>
</tr>
<tr>
<td>Posttest</td>
<td>30</td>
<td>102.76</td>
<td>3.42</td>
<td></td>
</tr>
</tbody>
</table>

* P<.05

Table 3 showed that attitudes towards integrated training courses to enhance teachers, researchers integrated, holistic learning of the basic school in Surin different by statistical significantly at level 0.05.

The results show that the average and standard deviation of the observation, practice, curriculum integration, training, capacity building for teachers, researchers Integrative Holistic group learning in basic education of Surin Province. The operational skills curriculum integration,
capacity building training to teachers, researchers integrated, holistic learning of the basic school in Surin were at a high level. \((X = 4.11, SD = 0.79)\) on the revenue side. Sort average score from descending 3 found 7) Knowledge of statistics and statistical methods used for research, integrated \((X = 4.56, SD = 0.68)\), followed by 9) Monitoring \((X = 4.55, SD = 0.83)\) and 29), presentations \((X = 3.51, SD = 0.75)\), respectively.

4. A performance of integrated training courses to enhance teachers, researchers Integrative Holistic group learning of basic school in Surin.

Table 4 performance integrated training courses to enhance teachers, researchers integrated, holistic learning of the basic school in Surin 1:1

<table>
<thead>
<tr>
<th>NO. of students</th>
<th>E1</th>
<th>Percentage</th>
<th>E2</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Average 212.66</td>
<td>79.25</td>
<td>Average 70.00</td>
<td>77.77</td>
</tr>
</tbody>
</table>

Table 4 curriculum integration training to enhance teachers, researchers Integrative Holistic group learning of basic school in Surin province, a 1:1 effective 79.25 / 77.77, lower than the threshold. 80/80 performance has brought it to improve the performance of integrated training courses to enhance teachers, researchers integrated, holistic learning of the basic school in Surin province, a 1:1 point. From now on

1. State the problem and the need for training. Has written to improve consistency. On a systematic training process. Using participatory activities for the benefit of the training experience.

2. Behavioral Objectives Add to behavioral objectives covered in the training course.

3. Training Content Subject to adjustment in accordance with the aims of the course and cut a too detailed to be appropriate and in line with the activity.

4. Activities and training methods. Write a detailed training methods to clear up. Time to suit the activities and events that are interesting. Consistent with the subject matter and the maturity of the trainees. It can provoke the joint training activities and lesson plans to reveal details. And the continuity of the course content.

5. Evaluation written evaluation to clear up. Add evaluation report of the training.

Table 5 performance integrated training courses to enhance teachers, researchers integrated, holistic learning of the basic school in Surin 1:10.

<table>
<thead>
<tr>
<th>No. of students</th>
<th>E1</th>
<th>Percentage</th>
<th>E2</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Average 219.60</td>
<td>81.33</td>
<td>Average 72.50</td>
<td>80.55</td>
</tr>
</tbody>
</table>
Table 5 curriculum integration training to enhance teachers, researchers Integrative Holistic group learning of basic school in Surin 1: 10 effective 81.33 / 80.55 higher performance criteria. 80/80

Table 6 performance of integrated training courses to enhance teachers, researchers integrated, holistic learning of the basic school in Surin province in 1:30.

<table>
<thead>
<tr>
<th>No. of students</th>
<th>E1</th>
<th>E2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>222.86</td>
<td>73.90</td>
</tr>
<tr>
<td>Percentage</td>
<td>82.54</td>
<td>82.11</td>
</tr>
</tbody>
</table>

Table 6 curriculum integration, capacity building training to teachers, researchers integrated, and holistic learning of the basic school in Surin province, effective 1:30 82.54 / 82.11 higher than 80 performance criteria. / 80

6. Retention Study

Table 7 compares the durability, integrated training courses to enhance teachers, researchers integrated, holistic learning of the basic school in Surin.

<table>
<thead>
<tr>
<th>Test</th>
<th>n</th>
<th>X</th>
<th>SD</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posttest</td>
<td>30</td>
<td>81.70</td>
<td>4.018</td>
<td>1.795</td>
</tr>
<tr>
<td>After Posttest</td>
<td>30</td>
<td>81.60</td>
<td>4.039</td>
<td></td>
</tr>
</tbody>
</table>

Table 7 showed that durable integrated training courses to enhance teachers, researchers integrated, holistic learning of the basic school in Surin. No different conclusion, teachers trained to 1 month are competent unchanged, that is, with the persistence of learning.

Discussion

1. The performance of the integrated training courses to enhance teachers, researchers integrated, holistic learning of the basic school in Surin province, a 1: 1 effective 76.41 / 75.55 less than satisfactory performance. 80/80 could be because of teaching. Teaching to the test is a PowerPoint tutorial exercises are not appropriate skills. A hard-to-understand picture colorful letters do not convey clear from observing the behavior of the students and ask for satisfaction is moderate, it has updated and revised text, image color accuracy of the language interesting and. Appeal the level of difficulty of the content of the lessons and exercises. A higher quality

2. Finding effective integrated training courses to enhance teachers, researchers Integrative Holistic group learning of basic school in Surin 1: 10 effective 81.07 / 80.88 above. 80/80 performance may be due to the observed behavior of the students and ask their satisfaction at the high level, but the students get feedback on language learning and teaching activities, and peer learning. Taught using problem based Teachers act as facilitators. To provide guidance and a good advisor. In addition, improved color accuracy, image text language to be
clear, concise and to the level of difficulty of the lesson into smaller units. Ideal to learn and understand the teacher's knowledge, share experiences with each other all the time.

3. The performance of the integrated course training to enhance performance, teachers, researchers, instructional integration, learning of basic education in the province. 1:30 pm (field) effective performance exceeding 81.92 82.19/80/80 is according to a set of hypotheses might be due to the process of teaching plan operations carefully. Strong every step since the preparation step instruction and assessment stages. With the development of teaching literature, practice teaching, media, Power Point quiz questionnaire measured the satisfaction received revised and developed to a higher quality in addition. Have to find a quality research tool. The angular precision value content (Content Analysis) or the consistency index values during the test with a purpose (IOC), difficulty (p), (r), the classification of the powers to test the confidence of the query by means of cross naba (Conbach) in this process, the researchers have also revised the July. Teaching process by motivating students as follows: 1) create more teaching by ask sakan. Discussions and work together as a subgroup to be enthusiastic, listening attentively. Establish mutual acceptance 2) have been used to reinforce the. In proper teaching and teachers are required to provide the desirable behavior by deleting the unwanted behavior of 3) practice test situations form the temple training activities as a stimulus, teachers attend lessons and awake in classes all the time), still. Baphon exam practice activities immediately so that teachers have reviewed their grasp. Is there anything that needs improvement is the way that allows teachers to keep the content going 5) teaching and learning practices, and assign a follow-up until it succeeds because of the success that occurs will encourage learners to learn next time. In accordance with research of the magical Chai Pong Sok riwong Krone (2552 (2009): 156) to study the development of the teaching pattern based on the theory of knowledge in order to strengthen their ability to create a student’s knowledge of mechanic industry. Performance patterns taught teaching based on the theory of knowledge in order to strengthen their ability to create a student’s knowledge of mechanic industry. Efficiency equals higher threshold 89.81 86.13/80/80 which is defined in accordance with the research of evolution have Suwannee ron (2551 (2008): 130) to study the development of forms of teaching and learning through a wireless network on a personal digital. Performance development forms of teaching and learning through a wireless network on a personal digital lighting for television production education. An effective equivalent to 86.12/85.75 correspond to the research of the gold sword, BEC (2552 (2009): 125) to study the development of the teaching pattern in mathematics that focuses on developing the student’s creativity, the students of grade 6, found that the effectiveness of teaching and learning formats, Switzerland. The mathematics that focuses on developing the student’s creativity, the students of grade 6 story addition, subtraction and multiplication, decimals efficiently 69.75/60.65 is according to standard criteria defined 60/60 complies with the research of Araya bouquet, California Ang (2553 (2010): 188) development studies. Bopkan teaching to foster the ability to think, solve problems effectively wichan Mystics instructional science student’s 5th grade performance format to promote the teaching and the ability to think, solve problems
effectively witchan Mystics citizenship wor. Students’ science grade 5 is equal to 86.11, compared with 87.67 criterion 80/80 were found to be higher-performance criteria defined. Does not correspond to the research of the phet reboot. ’S Boon (2552 (2009): abstract) to study the development of biology teaching pattern based on learning theory, group mixes for students, schools, science, Nakhon Nayok. Find the theoretical biology teaching and learning groups mix for students, schools, science, Nakhon Nayok. An effective 82.43/66.58 correspond to the research of authentic Thailand army met khan (2554 (2011): 169) to study the development of forms of teaching to learning integrated course of life information technology undergraduate students in Rajabhat University. Find an integrated teaching and learning information technology courses to undergraduate students in the life of the Rajabhat University. An effective 82.07/80.39 correspond to the research of lighting gel ZiLOG yachim (2552), who has studied and developed a teaching concept that reinforce Lae to solve problems in physics high school classes. Found that the effectiveness of teaching formats (E1/E2) is equal to 80.37/81.04 which passed 80/80 is defined, which is consistent with the concept of direction Na Khaem Mani (2545) concluded that the teaching is teaching execution plans that have been placed in a systematic way and consistent with the theoretical relationship. The primary learning or teaching uphold and has proven. Efficacy test Can help students to learn according to the aim only of the particular teaching format is also consistent with the conceptual development of the teaching pattern of Joyce and Weil that poem teaching formats must be supported, such as psychological theory, theory of learning and when developing forms of teaching, then prior to the widespread use will require research to test the theory, and a commercial quality inspection applied in real situations and adopt findings in improving the editing pattern that developed. (Moonlight prosperity chim. 2552: 203) and catfish (Duke.1990:90), said that the pattern of teaching each format will have different weaknesses and good points, does not have any teaching format, which is a universal fit, and for all of us, so it is the duty of the teacher to choose their teaching in order to help those.Creatine yonkoet learning based on the aim to comply with the research of grain, vine nian Siri (2552 (2009): 94) that the study of the development of the teaching pattern to improve the advanced thinking of Thailand found that the teaching format, the researchers developed powerful 85.45/84.27 is according to Kon, and consistent with the research of Hacienda Kung tha 10 November 2015 (2553) study, develop teacher training, integrated research in the classroom. It found that the effectiveness of the training pattern of steps and information collected is equal to 88.16/83.50 higher criteria that define 80/80 and in line with the research of Siri Kanda points (2552:61), who has studied and created and developed collaborative learning kits for preliminary research stories of the learners. Tea business research program subjects of business administration and economics, Faculty of Management Sciences, Uttaradit Rajabhat University found that a series of collaborative learning, academic research, business matters, statistics, preliminary research series 1 to series 3 efficient 88.50 88.00 89.25% and 86.25 88.37 87.93% respectively, which is higher than the benchmark set 80/80 can therefore be used. Teaching activities, research, academic, business and effectively, consistent with and for their research. Siri Panich (2553:281) has studied the development of
teacher training courses for the teaching profession by teaching project developed. It found that
the effectiveness of the training course, the theory is equal to 82.35/81.71 practices section is
equal to/higher than the threshold, 80.38 81.00 and compliance with research and faculty
celebrate fixed the midwives (2554:163) has studied the development of the training courses, the
academic lives Township economy. Aphiang as Thailand for students, Rajamangala University of
Technology ISAN Surin campus. Found that the training courses, the academic lives of suffici
economy as Thailand for students. Rajamangala University of Technology ISAN Surin campus
Efficiency exceeding 84.70 84.40/80/80 in accordance with research of khachen sacred Tri-
m (2553 (2010): 89) to study the development of the teaching activities using teaching that focuses on
skills practice using the device and circuit group of career & technology. Secondary 1 found that
models that focus on teaching the skills practice using the device and circuit group of career &
technology. Secondary 1 efficient 84.74/88.41and 80/80 exceeding that set.

4. Effectiveness Index for curriculum integration, training, capacity building for teachers,
researchers Integrative Holistic group learning of basic education in the province. There 0.7507
Effectiveness Index is based on the assumption that the professors conclude that courses through
integrated training to enhance teachers, researchers Integrative Holistic group. Knowledge
increased 75.07%, it is because the teaching is planning to conduct a thorough, concise process
all the steps from preparatory step instruction and evaluation. Teaching exercises are developing
skills. Media instructional Power Point test questionnaire measuring satisfaction has been
improved and developed to a higher quality than that. There is a qualitative study. To find the
content validity (Content Analysis) or the IOC between test purposes (IOC) is equal to 1.00. The
difficulty (p) is between 0.33 -0.78 discrimination (r) is between 0:21 to 0:32 of the test the
reliability of the questionnaire by means of Cronbach (Conbach) equals 0.83 more. 0.70 is
consistent with the research of optical month growth Chim (2552: 200), who has studied the
development of teaching concepts and build solutions in high school physics class. Found that
the effectiveness of the model is equal to 0.50, consistent with the research of Phatcharee own
staff Noonan (2553: 152), who has studied the development of teacher training, blended in the
classroom research found. The index of the effectiveness of the training pattern is 0.6235 indicates
that the trainees are learning progress 62.35 percent and in line with the celebration of his
research. The index shows the effectiveness of 0.6527 to progressively learning or knowledge
increased 65.27 percent.

5. Achievement curriculum integration, training, capacity building for teachers,
researchers integrated, holistic learning of the basic school in Surin. After school and before
school the difference was statistically significant at the .05 level. A summary of the key concepts
of each lesson and further motivate the students to do the exercises. Teachers help guide a close
one. Pointed out the thought process and the right decision to solve the problem in detail all
the steps until the students understand and can do the exercises correctly. In addition, there is
a qualitative research includes finding the content validity (Content Analysis) or the IOC between
test purposes (IOC) is greater than. 50, the difficulty (p) is between. 20. 0.80 discrimination (R) is
between. 20 to 1.00 of the tests, the reliability of the questionnaire by means of Cronbach (Conbach) is worth that much. 70 is consistent with research in light of the growing Chim (2552: 200.) to study the development of teaching concepts and build solutions in high school physics class. The experimental group showed a mean score of understanding of the concepts of physics was higher than the control group. A statistically significant at the 0.05 level coincides with research Pet Shreveport PRASARN Merit (2552: abstracts) studied the development of teaching biology, theoretical learning group combines for students Nayok study showed. Achievement before and after learning differences significant at the 0.05 level coincides with research Monchai Pongsakorn Narueput Wong (2552: 156) has studied the development of models for teaching the theory of knowledge to strengthen the ability to build student knowledge Industrial find that the ability to build student knowledge of industrial after learning styles, teaching theoretical knowledge creation to promote the ability to create knowledge. Differences are statistically significant at the 0.05 level by the experimental group had an average score, the ability to create knowledge classes higher than the control group is consistent with the research of evolution has Suwanna UK (2551: 130) were studied. Development of teaching through the wireless network on assistants, personal digital that achievement after higher than the previous significant level of 0.50 was teaching style through the wireless network. Kanda (2552), who had studied. Created and developed a series of cooperative learning of statistical research for the introduction of the course Business Administration and Economics Department of Management, Burapha University. The achievement of students with the Cooperative Learning Course on Basic Statistics for business research show that after higher than the previous level at statistical significance. 05 and coincides with the celebration of his research. Monday continued et al (2554: 163)) studied the development of training courses, technical sufficiency economy as a way of life for students in Thailand. Rajamangala University of Technology Isan Surin Campus, found that achievement to train academic life of sufficiency economy as a way for students to Thailand. Rajamangala University of Technology Isan Surin Campus The difference was statistically significant level. 0.05 is consistent with the findings of the General Yusuf Trilogy Works Lane (2553: 89) studied the development of learning and teaching using a form of teaching that emphasizes practical skills for using equipment and electrical groups.

6. Persistence in learning curriculum integration training to enhance teachers, researchers Integrative Holistic group learning of basic school in Surin. Is based on the assumption that the persistence in learning curriculum integration, training, capacity building for teachers, researchers integrated, holistic learning of the basic school in Surin. No different conclusion, the teacher in Surin, who is trained to 2 weeks are competent unchanged, that is, teachers are durable learning curriculum integration training to enhance teacher researchers. Integrated holistic Probably because of the training course, integration, training, capacity building for teachers, researchers Integrative Holistic. He trained with the knowledge and understanding of the lessons of the 10 lessons are truly learned, step by step. From simple to complex, from small to very complex difficult. From concrete to abstract. Learn real examples of the study is the work of academic
research. Thesis in the Master - Doctorate. A real and practice the exercises As well as test the lessons regularly. The peer learning. Knowledge sharing is indicative of what is good and right all the time. The result of the action by learning (Learning by doing) make the learning experience a durable and consistent with the research of celebrated generals. Monday continued et al (2554: 163) has studied the development of training courses, technical sufficiency economy as a way of life for students in Thailand. Rajamangala University of Technology Isan Surin Campus showed persistence in learning. Not correspond to different research concepts Bay Prom Shoes (2554: 117) has studied the development of achievement in social studies. Religions and cultures, critical thinking and persistence in learning of students in the fifth, using a form of teaching crystallized with techniques using graphic organizers found that students in the fifth to be handled. Learning styles, teaching and crystallisation techniques with the use of graphic organizers are durable to learn more.

7. Satisfied with the integrated training courses to enhance teachers, researchers integrated, holistic learning of the basic school in Surin find a satisfactory curriculum integration. Integrated capacity building training to teachers, researchers, integrative holistic group learning of basic school in Surin. The overall level is based on assumptions It is because the design of instruction are performed to analyze the needs of the students. The feasibility study and the consistency of the program, according to expert opinion. Course structure The stated purpose required of the students by focusing on capacity building activities, teachers, researchers, Integrative Holistic be conducted in a systematic sequence begins. Sparked the idea to expand the idea. And evaluation and application of knowledge to use. The instructors, curriculum integration, training, capacity building for teachers, researchers Integrative Holistic group. An example of true and skills of 30 activities using peer teaching and learning, using problem. The instructor will serve to facilitate guidance and help when necessary. The question at issue learners to think and solve problems all the time. In addition, the course will encourage students to learn together. The exchange of learning experiences to friends to friends anytime. Allow the teaching of life and actual practice the students were satisfied with the teaching of this lot. Consistent with the research of the meat rations Nien Siri (2552: 94), the study of the development of ideas to improve teaching advanced courses in Thailand found. The students were satisfied with the format of instruction level. Consistent with research Monchai Pongsakorn Narueput Wong (2552: 156) has studied the development of models for teaching the theory of knowledge to enhance their ability to build student knowledge and industrial experience that students have. Satisfaction with the style of teaching theoretical knowledge creation is at the highest level and as a separate item with the highest average score, including the atmosphere in the classroom is not stressed. Forms of teaching that students learn at any time in accordance with the research evolved with Suwanna UK (2551: 130) has studied the development of teaching and learning through the wireless network on aid workers. Personal digital found that the average satisfaction rating based on learning styles, teaching through the wireless network on a personal digital assistant of the sample. The average total 4:09 remained very satisfied. Consistent with research
Pet Shreveport PRASARN Merit (2552: abstracts) studied the development of teaching biology, theoretical learning group combines for students Nayok study found that students were satisfied with the learning styles. Teaching biology combines theoretical learning group for high school students in science Nayok. Consistent with research Ari PRI Gul (2553: 155) has studied the development of teaching listening skills in English as the teaching language for communication and learning using brain as a base to strengthen. The language used for communication of university students found that students are satisfied with teaching as a form of teaching that develops depends to a large extent. Consistent with research Araya bouquet Andre Assumption (2553: 199) has studied the development of teaching and learning, to promote the ability to think the problem has urged groups to learn the science of the students. School year five of the students were satisfied with the form of teaching to enhance your ability to solve problems with a critical group of science students in grade 5 at the highest level consistent with the work. Research Phatcharee own staff Noonan (2553: 154), who has studied the development of teacher training, blended in the classroom research found that the trainees were satisfied in practice. Training at the highest level and in line with the research of Kanda locks constant (2552: 61), who has studied and developed a series of cooperative learning about statistics for the preliminary research of the learning industry research, program management and. Faculty of Economics, managementUttaradit Rajabhat University found that students in the experimental group participated in learning activities using a series of joint research studies on business statistics for research. Opinion that a series of cooperative learning were created by combining appropriate levels and consistent with the research of Anoma Siriphanich (2553: 281) has studied the development of training courses for teachers. The teaching model, teaching project that developed the opinion of teachers who are trained by the high level and consistent with the research of the project. The Sriwanvit (2552: 119-122) studied the synthetic form of participatory action research in the classroom using computers showed that the satisfaction rating of the instruction on various aspects of the system. with an average of 4.06 and a standard deviation of 0.97 satisfying applications at a high level and the satisfaction of learners towards various aspects that have an average value of 3.71 and a diversion. SD 1.21 user satisfaction was high.

**Recommendations**

Suggestion for adoption.

1. Integrated training courses to enhance teachers, researchers Integrative Holistic Learning learning basic school in Surin. Lecturer or instructor should explain the teaching process. Practice the exercises for students to understand the role of the teacher in the classroom. The presentations from the treatment group using a systematic process of using the issue as a base. Acceptance and respect of fellow group members. Brainstorming to present it properly and correctly.

2. Teachers should prepare to teach a lesson to all such documents, Powerpoint teaching curriculum integration training to enhance teachers, researchers Integrative Holistic Group Powerpoint holistic research activities. Tests included exercises and training activities were
measured satisfaction. Measure the game with the Plan carefully before every step and teaching activities at all times.

3. Before Implementing Teaching courses integrated capacity building training for teachers, researchers integrated, holistic learning of the basic school in Surin. To carefully study the manual thoroughly to teaching should be carried out step by step from simple to difficult. Less complex to more complex From concrete to abstract For example, focused and real. Should not be teaching or transferring knowledge across the stage. Except for teaching integrated.

4. The development of an integrated capacity building training to teachers, researchers integrated, holistic learning of the basic school in Surin. To be taught by a peer (Peer Tutoring) before teaching. Teachers and those involved should be considered and implemented as follows.
   1) Analyze the content of the course is to teach a child any sort of reasonable.
   2) Preparation of exercise classes. Schedule the interpretation of test results for easy inspection and service providers to test if the teacher is teaching and conducting tests themselves.
   3) To provide adequate resources, including books, journals, newspapers and other teaching materials such as tape recorders, radios, and answer each exercise.
   4) Select instructors (Tutors) Master classes (Tutees) grouping or pairing between the instructor and the students and teachers prepare students for their role.

5. Development of integrated training courses to enhance teachers, researchers Integrative Holistic group learning of basic school in Surin. To be taught using problem-based. (Problem-Based Learning) before teaching. Teachers and those involved should be considered and implemented as follows.
   1) Prepare a problem
   2) Create a link to the issue. How to teach a debate linked to previous experience. Use questions to stimulate original experience. The assumptions and scenarios and experiments.
   3) Establish a framework of education. How to teach a brainstorming the table shows some ideas about solutions. Facts about the issues that you need to grab more. The study further research and brainstorming techniques to help find ideas.
   4) The study group method using role plays. Simulation for training, research and group work effectively and for training, research and group work effectively.
   5) Decided to find a solution approach to debate the pros and cons, strengths and weaknesses of each solution.
   6) Create a portfolio approach to group work.
   7) Assessment of learning how to teach using Mind Mapping.

6. Prepare and practice skills curriculum integration, capacity building training to teachers, researchers integrated, holistic learning of the basic school in Surin. In accordance with the needs
and interests of teachers. The survey is conducted prior to the exam, the professor teaching to meet the needs and interests of teachers.

7. Should encourage and work assignments can gradually harder in order to challenge the students and stressed the students to practice their skills from participating in the public consciousness until the end of the course.

8. Power point used for curriculum integration, training, capacity building for teachers, researchers integrated, holistic learning of the basic school in Surin. Must present a story that is easy to follow examples of successful teachers, researchers and empirical research have joined together to share thoughts comment. The advantages and limitations of each creative activity, gradual, continuous and summarizing all activities.

9. The insertion of morality and ethics in the teaching curriculum integration, training, capacity building for teachers, researchers integrated, holistic learning of the basic school in Surin. For example, events that activity by faculty research that benefits a role model or to create a society that can be used on a daily basis in accordance with Chapter 10 of lessons and activities.

Suggestions for further research.

1. This research aims to develop an integrated training program to enhance teachers, researchers integrated, holistic learning of the basic school in Surin. Vocational education should be in the next group. Group Technical Education Teachers in higher education institutions in each region and each province should also experiment with other proper purposes such as research, experimental design, and Solomon.

2. Should study of knowledge integration, training courses, capacity building for teachers, researchers integrated, holistic learning of the basic school in Surin. Nakhon Ratchasima, Chaiyaphum, Buri Ram, Si Sa Ket province, such as Ubon Ratchathani.

3. Study of Factors Affecting integrated training courses to enhance teachers, researchers integrated, holistic learning of the basic school in Surin. In elementary school, secondary vocational education or higher education in the province.

4. Study of Education and Development Organization of Learning curriculum integration, training, capacity building for teachers, researchers integrated, holistic learning of the basic school in Surin. In elementary school, secondary vocational education or higher education in the province. The other theory

5. Should a study about knowledge management, integrated online training courses to enhance teachers, researchers integrated, holistic learning of the basic school in Surin. In elementary school, secondary vocational education or higher education in the province. The other theory

6. Carefully study the education and development of web-based curriculum integration, capacity building training to teachers, researchers integrated, holistic learning of the basic school in Surin. In the primary, secondary or tertiary, vocational education schools in various provinces. The other theory
5. Acknowledgment

Thank you, Vice President for Campus Surin. Prof. Martin Petty Wedge, currency Dean Faculty of Science and Technology. In giving advise and counseling, monitoring and evaluation of the research to progress all along. Thank specialists 5 Dr. Rhys Hello. Prof. Dr. MALIWAN Somsak. Prof. Dr. Paiboon soft too. Prof. Dr. Chatri Jewell Koson and Asst. Prof. Dr. Dotted Dixit in sea birds that. advice invaluable and is particularly useful for research thanks to teachers and educational areas, educational Surin 1, 2 and 3, and the Deputy Director and Director of the Office of Education Surin 1, 2 and 3, which were used as a sample group.

6. References


[6] C. Kongjan and others (2554) Development of training curriculum in living by economy sufficiency in Thai way for undergraduate student of Rajamangala University of Technology Isan (Surin Campus).

[7] C. Kongjan and others (2555) Development of instructional model in teaching social academic service for enhance public service mind based on economy sufficiency philosophy for undergraduate student of Rajamangala University of Technology Isan (Surin Campus).

Biodiversity of Banana *Musa* spp. in Nakhon Sawan Province

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Abstract

The aim of this research was to survey the biodiversity of banana cultivars (*Musa* spp.) in Nakhon Sawan province. The survey was conducted by using line transects method in seven districts on the watershed area in Nakhon Sawan which were Kao Liao, Krokpra, Chumsaeng, Thatako, Banapotpisai, Phayuhakiri and Mueang Nakhon Sawan. The biodiversity indices (Shannon index (H')), Simpson's index (1-D) and Evenness index (E_H)) and cluster analysis dendrogram were analyzed. Twenty-one banana cultivars were recorded and they could be divided into four groups according to common name in Thai: Kluai Khai, Kluai Namwa, Kluai Hom and others. All biodiversity indices indicated that Phayuhakiri had the highest of diversity (H' = 2.09), evenness (E_H = 0.75) and abundance (1-D = 0.84) of banana cultivar in Nakhon Sawan. In dendrogram analysis, the results had showed that Mueang Nakhon Sawan had no similarity (0%) of species diversity to any districts in this study. Therefore, it could be concluded that Phayuhakiri had the highest biodiversity of banana cultivars in Nakhon Sawan province.

Keywords: Biodiversity, Banana, *Musa*, Nakhon Sawan

1. Introduction

Banana (*Musa* spp.) is one important economic plant in Thailand because all part of banana is very useful plant for human, including fruit, leaf, flower and stem (Kanchanakul, 2008). Banana is monocotyledon plant and classified in to Family Musaceae, Order Zingiberales. It is originated in south Asia (Silayoi, 2002; Thomsopa et al., 2013). Family Musaceae consists of three genera; *Musa*, *Ensete* and *Musella*. Musaceae can be subdivided according to the basic chromosome/genome number and morphological characters (Phothipan et al., 2005). The genus *Musa* is a majority of the section *Eumusa* which included of all edible bananas. The edible banana is assumed to be derived from two wild diploid banana species; *M. acuminate* (AA genomes) and *M. balbisiana* (BB genomes) (Silayoi, 2002; Talumpai et al., 2011). Therefore, the classification of banana cultivar is based on 15 different morphology characters among *M. acuminate* and *M. balbisiana* according to Simmonds & Shepherd (1955) (Silayoi, 2002).

Nakhon Sawan is located on the lower north of Thailand and it consists of 15 districts. Nakhon Sawan is the origin of Chao Phraya River which is combination of four rivers; Ping, Wong, Yom and Nan. There are seven districts located on Chao Phraya watershed area including Kao
Liao, Krokptra, Chumsaeng, Thatako, Banpotpisai, Phayuhakiri and Mueang Nakhon Sawan. According to the location, these seven districts are suitable for agriculture and fishery. Banana is one economic plant which generally found in the markets at Nakhon Sawan. There are about 170-200 banana cultivars in Thailand (Kanchanakul, 2008). However, some banana cultivar is able to plant throughout of Thailand but some cultivar can plant only some restricted area or it was introduced from its origin for any purpose. Interestingly, there still is no official information about the biodiversity of banana cultivar in Nakhon Sawan. Thus, the objective of this study was to survey the biodiversity of banana cultivar (*Musa* spp.) in Nakhon Sawan.

2. Materials and Methods

Research area

Seven districts located on the watershed area in Nakhon Sawan including; Kao Liao (A1), Krokptra (A2), Chumsaeng (A3), Thatako (A4), Banpotpisai (A5), Phayuhakiri (A6) and Mueang Nakhon Sawan (A7) were focused on this study.

Survey method

Line transects method was used in this study. All banana cultivars were recorded from all sub-districts in each district. A school in each sub-district was selected and used as a beginning point of the survey. The geo-reference of each school was recorded. The name of banana cultivar and its frequency were recorded along both sides of school for 1 kilometer (500 meters for each left and right). Each banana cultivar was photographed and identified based on Kanchanakul (2008). Additionally, interviewing local residents also used to get more detail about banana cultivar in studied areas.

Data analysis

The proportion of banana cultivar in each district were analyzed as percentage. The biodiversity indices which were Shannon index ($H'$), Shannon evenness index ($E_H$) and Simpson’s index (1-$D$) were calculated following Heip, Herman and Soetaert (1988) Spellerberg and Fedor (2003) and Nolan and Callahan (2005)

1. Shannon index ($H'$)

This index is commonly used to mean the species diversity in research area. It could be calculated by following formula:

$$H' = - \sum_{i=1}^{s} (P_i \times \ln P_i)$$

$s$ is the number of species and $P_i$ is the proportion of individuals of each species belong to the $i^{th}$ species of the total number of individuals

2. Shannon evenness index ($E_H$)

Evenness is a measure of the relative abundance of the different species making up the richness of an area. The value of $E_H$ ranges between 0 and 1, with 1 being complete evenness.

$$E_H = H' / H_{max} = H' / \ln S$$
3. Simpson’s index (1-D)

Simpson’s index is a measure of diversity which takes into account the number of species present, as well as the relative abundance of each species. The value of D ranges between 0 and 1. Simpson’s index was express by 1-D.

\[ D = \sum (p_i^2) \]

4. Cluster analysis dendrogram

The dendrogram was constructed by using PC-ORD version 4.10 with value of Sorensen (Bray-Curtis) index. A dendrogram is a branching diagram that represents the relationships of similarity among research area.

3. Results

Twenty-one different banana cultivars were recorded across the seven districts on watershed area in Nakhon Sawan. According to cultivar’s Thai local name, the specimens were divided into four groups i.e. Kluai Khai group (3 cultivars), Kluai Namwa group (6 cultivars), Kluai Hom (5 cultivars) and others (7 cultivars) as shown in Table 1. There were two banana cultivars which found in all seven districts; Namwa Kab Khieo and Namwa Nuan Chan. Three banana cultivars were found only in Phayuhakiri i.e. Khai Pieo, Hom Khieo and Hom Thip Nakhon Sawan. In Mueang Nakhon Sawan only one banana cultivar were found i.e. Nom Sao.

The highest banana cultivar diversity was observed in Phayuhakiri (16 cultivars) and the lowest banana cultivar was observed in Banpotpisai (5 cultivars) as showed in Table 1 (Total cultivar). Namwa Kab Khao was a dominance cultivar in Kao Liao, Krokpra and Phayuhakiri (54.9%, 63.8% and 24.7 %, respectively) (Table 1). Namwa Nuan Chan was a dominance cultivar in Chumsaeng, Thatako and Banpotpisai (66.3%, 69.2% and 78.1%, respectively). While Namwa was a dominance cultivar in Mueang Nakhon Sawan (60.3%) (Table 1).

Table 1 The percentage of banana cultivar in 7 districts on watershed area in Nakhon Sawan province

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<tr>
<td><strong>Kluai Khai group</strong></td>
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<tr>
<td>Khai</td>
<td>2.6</td>
<td>8.7</td>
<td>8.4</td>
<td>0.0</td>
<td>5.1</td>
<td>8.5</td>
<td>11.8</td>
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<tr>
<td>Khai Kamphaeng</td>
<td>0.0</td>
<td>0.0</td>
<td>8.4</td>
<td>0.6</td>
<td>0.0</td>
<td>0.4</td>
<td>0.0</td>
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<tr>
<td>Khai Pieo</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.4</td>
<td>0.0</td>
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<tr>
<td><strong>Kluai Namwa group</strong></td>
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<tr>
<td>Namwa</td>
<td>0.0</td>
<td>1.3</td>
<td>0.0</td>
<td>2.5</td>
<td>0.0</td>
<td>19.4</td>
<td>60.3</td>
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The biodiversity indices were calculated and showed in Table 2. The highest value of species diversity ($H^\prime$) and evenness ($E_H$) were observed in Phayuhakiri (2.09 and 0.75, respectively). The least value of species diversity ($H^\prime$) and evenness ($E_H$) were observed in Banpotpisai (0.79) and Thatako (0.46), respectively. These results correlated to the Simpson’s index (1-D) which indicated that Phayuhakiri had the highest diversity of banana cultivar (0.84) and Banpotpisai had the least diversity of banana cultivar (0.37) in Nakhon Sawan.

Table 2 Biodiversity indexes of banana cultivar in seven districts on watershed area in Nakhon Sawan province; Shannon index ($H^\prime$) Shannon’s Evenness Index ($E_H$) and Simpson’s index (1-D)
A cluster analysis dendrogram represented the relationship or similarity of species diversity between seven districts. A dendrogram could be divided into three clades at 50% similarity (Figure 1). The first clade consisted of Kao Liao (A1) and Banpotpisai (A5) with 100% similarity. The second clade consisted of Chumsaeng, Thatako, Krokpra and Phayuhakiri and could be subdivided into three groups. Group one consisted of Chumsaeng (A3) and Thatako (A4) which more than 75% similarity and 75% similarity to Group two (Krokpra; A2). Group one and Group two had more than 60% similarity to Group three (Phayuhakiri; A6). The third clade consisted of Mueang Nakhon Sawan (A7) which had 0% similarity to other groups (100% distance).

**Figure 1 Cluster analysis dendrogram of the similarity of banana cultivar diversity between 7 districts on watershed area in Nakhon Sawan (A1 = Kao Liao, A2 = Krokpra, A3 = Chumsaeng, A4 = Thatako, A5 = Banpotpisai, A6 = Phayuhakiri and A7 = Mueang Nakhon Sawan)**

### Distance (Objective Function)

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<tbody>
<tr>
<td>H'</td>
<td>1.27</td>
<td>1.41</td>
<td>1.27</td>
<td>1.01</td>
<td>0.79</td>
<td>2.09</td>
<td>1.33</td>
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<tr>
<td>E_H</td>
<td>0.71</td>
<td>0.55</td>
<td>0.53</td>
<td>0.46</td>
<td>0.49</td>
<td>0.75</td>
<td>0.58</td>
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<tr>
<td>1-D</td>
<td>0.63</td>
<td>0.57</td>
<td>0.54</td>
<td>0.48</td>
<td>0.37</td>
<td>0.84</td>
<td>0.60</td>
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</table>

### Discussion

The origin of edible banana was form two species of wild banana; *Musa acuminata* Colla (AA genome) and *Musa balbisiana* Colla (BB genome). The twenty-one banana cultivars which found in this study could be divided into three cultivars. The first, *wild balbisiana* consisted of Tani. The second, *acuminata cultivars* were edible banana and it could be subdivided into two
groups; AA group (Kluai Khai group, Hom and Leb Mu Nang) and AAA group (Hom Khieo, Hom Thong and Nak). The third, hybrid cultivars (acuminate x balbisiana) were edible banana and it could be subdivided into two groups; AAB group (Nom Sao) and ABB group (Namwa groups, Tip and Hak Muk). The subdivided group of cultivars was based on the number of chromosome or genome in each cultivar (Silayoi, 2002). While there were no any report to classify the group of Thong Ma Aeng and Hom Thip Nakhon Sawan. The further studies on these two cultivars may need to clarify based on genonomic information.

Namwa group was a dominance cultivar in this study. It might be because of its various home utilizations, especially for cooking and dessert. Therefore, some areas were found Namwa plantation for commercial purpose. Namwa Kab Khieo and Namwa Nuan Chan were common cultivars which found in seven districts. The highest percentage of Namwa is Namwa Nuan Chan which found in Banpotpisai (78.1%) and it is a dominance cultivar of this area. The least percentage of Namwa is Namwa Kab Khao which found in Chumsaeng (1.1%). Therefore, Namwa Nuan Chan is a dominance cultivar among Namwa group. There were four cultivars which only found in one district of each; Khai Pieo, Hom Khieo, Hom Tip Nakhon Sawan and Nom Sao. From the interview, all these cultivars were introduced from other areas (usually from their relatives). Therefore, it was not widely cultivated in Nakhon Sawan. Tip cultivar which was found in Thatako and Phrayuhakiri may also introduced from southern Thailand as, it is commonly found in the southern of Thailand (Kanchanakul, 2008).

The highest banana diversity was observed in Phayuhakiri because it located along Chao Phraya River so it is suitable for planting banana. Additionally, there were many banana plantations in this area and the banana cultivar was economic cultivar such as Khai, Namwa, Hom, Hak Muk and Leb Mu Nang. Kao Liao and Banpotpisai were located along the river on the north of Nakhon Sawan and they were neighbored district. The commercial banana cultivar of these two areas were identical as they may exchange their banana cultivar with nearby farmer. The popular cultivars were Namwa Nuan Chan, Hak Muk and Khai. Thus, a dendrogram showed the similarity between Kao Liao and Banpotpisai at 100%. For other districts, almost people was planted banana for household usage such as cooking and dessert. Some banana cultivar were introduced by their relatives, so it showed the diversity of banana cultivar when compared to Kao Liao and Banpotpisai. Especially, Mueang Nakhon Sawan showed 100% distance from other districts. Because this area is city area and people do not plant banana for commercial (restricted area) but they planted for household using only. Thus, it could be explained the non-similarity of Meuang Nakhon Sawan when compared to other districts.

5. Conclusion

Twenty-one banana cultivars were found in seven districts on watershed area in Nakhon Sawan province. Namwa Kab Khieo and Namwa Nuan Chan were observed in all seven districts in this study. The highest of biodiversity indices (species diversity, evenness and abundance) was
observed in Phayuhakiri district. A cluster analysis dendrogram indicated Mueang Nakhon Sawan had no similarity of banana cultivar diversity to other districts in this study.

6. Acknowledgement

Funding for this study was provided by Lower North Research Network, Naresuan University under project LN-58-04. We thank Faculty of Science and Technology, Research and Development Institute, Nakhon Sawan Rajabhat University, and Uthaithani Community Collage for all supporting during running this project. Finally, we would like to thanks Dr. Sravut Klorvuttimontara, Kasetsart University Kamphaeng Saen Campus, for data analysis suggestion.

7. References

A Study of Language Usage Written in Personal Experiences Note  
by Luang Pu Pan Tittatammo, Wat Pa Nampoo, Loei Province  

Krissana Yodmongkon\textsuperscript{1}  

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Abstract  
This research aimed to study the language usage in the note based on Systemic Functional Grammar. It included genre-based approach: language in culture, and register: language in situation. The cultures found in the note were also collected. The data were drawn from the book titled “Experiences, Guidance’s, and Dhamma from Palm Leaves”. The first edition, published in 2007, was used as the main source and supported by the second edition, published in 2008. The cultures mentioned in the note were also collected. Besides the documentary study, some information was given by Luang Pu Pan. The data were analyzed by content analysis.  
The genres (language in culture) of language usage through the note were mixed. The dominant patterns, however, were divided into two types. They were report genre: the story no. 1 and no. 14. The others were recount genre. In terms of register (language in situation), the field and the mode of the whole note and each story were presented directly. The tenor revealed that the writer had the higher status than the readers. In each story, however, they were various because each participant status was different from each other. For cultural purposes, they were daily life, believes, rites, spirits, guardian spirits, ceremony, as well as local wisdom about herbs.  
Some traditional ceremonies have been occurred to date. A comparison between the old and the present one should be studied. The status of the ceremony in each society should be also studied.  

Keywords: Language used in personal note, Cultures recorded in personal note

1. Introduction  
With mutual agreement, the third pillar of ASEAN Community is known as ASCC: ASEAN Socio-cultural Community. That is, an identity and dignity of each race and nation in the globalization must be maintained. It is a paradox policy of being the ASEAN community with one own identity.  
It is agreed that each nation should not deny the innovation of modern world and being the one in Asian region. Dignity, however, of each race must be conserved and promoted too. To maintain a root of race, language and culture are one of these identifications. Each generation of each race should be encouraged to learn, be proud and love own identity. It is not a cultural lag but conservation. It is accepted that all things must be changed and might be disappeared at any time. Allowing these changes go on, however, benefits the members and new coming generations
to keep phase with the other nations. The world is beautiful if there is diversity of nations in the same region.

By the way, language is not only a tool of communication but it is also a wonderful recording instrument as well. The past issues could be brought to the readers’ consciousness, understanding and imaginations. They are able to touch the past events by heart through the written language. This action could be done with unlimited of time and places. A personal note is one of valuable recorder of the past uncommon issues. The most interesting, moreover, the note was made by the honorable Buddhist monk. It means that all written issues are believed to be the truth without any questions. With these reasons, this documentary research was done in order to disclose writing styles, social relationship and some valuable experiences before being left on shelves.

Objectives

To study the language usage, based on in term of linguistic approach, as well as the cultures.

Research question

1) What styles of Language written by aged Buddhist monk would be like?
2) What kinds of traditional cultures in the past were performed?

2. Research Scope

Content

Linguistics: to study how the language was used based on Systemic Functional Grammar (SFG). The emphasis put on language in context. They are genre (Language in Culture) and register (Language in Situation).

Culture: to find some traditional cultures, activities and local belief found in the note.

Conceptual Framework

<table>
<thead>
<tr>
<th>Frame of analysis based on Systemic Functional Grammar Theory</th>
<th>Study the book titled “Experiences, Guidance’s, and Dhamma from Palm Leaves”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genres used and cultures</td>
<td></td>
</tr>
</tbody>
</table>

Data

The data were drawn from the book titled “Experiences, Guidance’s, and Dhamma from Palm Leaves” which was copied from original handwriting note by Luang Poo Pan Tittatammo, Wat Pa Nam Poo, Loei Province. This book was chosen to study because the content was the issues in the past and the recorder is still alive.

According to Luang Poo Pan’s permission, the first published copy was made in 2007 and all of the stories were arranged carefully after the original order of hand written note. The second edition did in 2008 with rearrangement of story-orders but the content was the same as the first one. This book was also republished in 2009 and 2010 on the occasion of Luang Poo Pan’s birthday in a year, that is 11th of November.
The stories were divided into three groups according to their main content as the followings.

**Group 1: The Lord Buddha’s word**

The story no. 1 **Five Percept**
The Five Percept was explained after the Lord Buddha’s words and supported the Five Percept with real events happened in daily life.

The story no. 14 **Luang Poo Pan’s sermon “Mind leading Actions”**
As Lord Buddha said, most of human’s activities happened because their minds lead the thought and the actions. If unwanted things happened, one should consider his own mind firstly.

**Group 2: Luang Poo Pan’s direct experiences**

The story no. 2 **Experiences during Being Young Novice**
When Kampan (Luang Poo Pan’s original name) was young, he ordained as a novice. By this time, he had opportunity to travel with one senior Buddhist monk to Muang Tung and Muang Pa villagers of Lan Chang Province where was one of Thailand’s land after the second world war. There were so many experiences that the young novice took in mind and wrote the note later.

The story no. 3 **Encountered the host spirit and herb-orge**
After leaving the Buddhist Monkhood, Mr. Kampan was married to Ms. Kampu and found the wife’s family believed in hostspirit. Before giving birth to the young daughter, his wife was possessed by an evil. This suffered Mr Kampan so much.

The story no. 4 **Decision to ordain as Buddhist monk of Dhammyuttika**
After his wife’s death, Mr Kampan decided to ordain as a Buddhist monk of Dhammyuttika.

The story no. 5 **Leaving the Learned- Incantation**
At Wat Tam Pa Poo, Mr Kampan was told to ignore all the learned incantations.

The story no. 6 **Pi Pong: People were possessed by bad spirit and liked to consume dirty things.**
Luang Poo Pan recounted about Pi Pong he met at his rice field in the early dawn.

The story no. 7 **Jinn at Wat Ban Nong-own Sub-village**
Luang Pu Pan stayed at the abandoned temple at the hall. There he heard the sound made by a jinn. It did some signals to show that it was living at the Ban Nong-own temple for years.

The story no. 8 **On pilgrimage to pay respect to Luang Poo Tete**
Luang Poo Kamdee, highly respected by Buddhist monks at Wat Tam Pa Poo.

The story no. 9 **Faithless Words**
Luang Poo Pan’s experience about one monk who did not do what he said Later, Luang Poo Pan heard that he has been lunatic.

The story no. 10 **Hallucination**
Luang Poo Pan did something wrong from the Buddhist discipline, then he sensed some smell all the time.
The story no. 11 “Presage” is grouped to be 6 issues as the original note as follows:

11.1 Mother passed away
When Kampan was young and playing with his cousins, he had a hunch that his mother would die.

11.2 Younger Brother’s dead
During his journey from Lan Chang Province, young Kampan as a novice had a hunch about one of his young brother. Arriving Loei Province, he was told that his younger brother died on the day that he had a hunch.

11.3 Seeking by the Son
During walking mediation, Luang Poo Pan saw his son’ sad face. Later, he received that his son got the accident and passed out.

11.4 Pra Wichai’s Mind-Appearance
During his sleepy state, Luang Poo Pan saw another monk’ face clearly and this monk stayed at the nearby monk’s dwell. Luang Poo Pan felt surprised so went to see this monk and learned that this monk was thinking of talking some Dhamma topic with Luang Poo Pan.

11.5 Convinced by Luang Poo Pa’ Soul
Being sleepy, Luang Poo Pan saw Luang Poo Pa’s transparent body through the shut door of the dwell and asked Luang Poo Pan to come along with him

11.6 Asking for Payment by Ajarn Krissana’ Soul
Using a left blanket with a hole at Wat Pa Santitam Temple, at night Luang Poo Pan dreamed of Ms.Krissana who passed away by cancer. This lady asked for the blanket’s payment. Then Luang Poo Pan realized that the monks at the temple did not trance merits to Ms. Krissana.

The story no. 12 State of being husband and wife in the past life
Luang Poo Pan be leaves that a couple must have some relationship before in the previous existence.

Group 3: The other people’ s Sin
The story no. 13 Committed a Sin
A recount story about Mr Kampan’s relative who earned his living by stealing others’ buffalos. Sometimes the buffalos were killed. Later this man was killed like the buffalos.

3. Research Methodology
This documentary research drew the data from the book containing 14 stories which were divided into 3 groups:

1. The Lord Buddha’s word (no1 and no.14)
2. Luang Poo Pan’s direct experiences (no. 2 to no.13)
3. Luang Poo Pan’s presage: 6 stories.(no.11)

The data were manipulated as follows:
- The data were arranged by on original order in the book.
A paragraph no. 5 on page 28, e.g. \( \pi = 5 \)  P= page no.

Analyzed by content method.

Examples of analysis: genre-pattern: goal-staged-social activities

- Goal Oriented: To recount
- Staged: beginning-content-end
- Social activities: Human’s activities

The story no. 2 Experiences during Being Young Novice

1. Beginning: (Page 54 Paragraph no. 1)
   “The second World War had just finished in year 1839. By that time the cost of living was very high, fire match was very expensive and hard to find, for example. .......”

2. Content: (page 54-74, paragraph nos. 3-55)
   “When the senior monk called Kruba Mun was ready than they began travelling.....”
   “Reached Muang Tung village, it was found that Luang Poo Ya Kru Noi was not there...”

3. End of the story: (page 74 paragraph no.58)
   “This is a story of host spirit or ghost which novice Pan had met by his own eyes and would like to disclose to the others..... Luang Poo Pan questioned for consideration weather spirit or ghost can be the refuge of human.”

Example of Culture Purposes:

The story no. 2 Experiences during Being Young Novice

“Lek Fai Ptram” (Brahmin’s fire stone, page 53 paragraph 1)
   “After the second World War, the daily-materials were very expensive. To make fire, it had to use Brahmin’s fire stone: a friction rub of iron and stone over cotton. When the cotton was fired then it would bring to use for many purposes.”

“Kam Pra Kam Ploy” (page 42 paragraph 3)
   “.. If we had killed their parents and left the children, when the retribution reached, our parents would pass away since we were young and became orphans.......”

4. Results

All stories were written with correspondence to the forms of Genre-based approach, that is, the stories no. 1 and 14. They are considered to be report genre because Luang Poo Pan gave sermons about two topics said by the Lord Buddha thoroughly and strictly based on the original content. The other stores were recount genre because the writer recorded the things he met or experienced. If there were any questions, he usually reached to local people who were in the context and asked. Luang Pu Pan is a detail-oriented person, how people dressed, acted, and words –used, for examples. Each story comprised of the beginning, content and ending or reorientation. For the register (language in situation), all the stories’ titles presented the content (field) directly. For the relationship between the writer and the reader (tenor), the
writer had a higher status than the reader but with friendly and easily contact. For the channel of communication (mode), all stories were presented through written language.

In addition, cultural findings are to be mentioned. Some traditions were revealed but most of them might be not heard or seen by the new generations. The old performance of the some ceremonies might be different from the present performance. However, it is good to know that some traditional ceremonies have been performed to present although some details might be changed. Some of them are festivals. Song Kran Day, making offerings to the spirit before planting, religious rites for village-happiness such as asking Luang Pu Yakru Noi to exorcize harmful spirits, learning incantation, belief in host spirit, for examples. These cultural aspects also included physical contact experiences about traditional rites: supernatural things. Some were seen by his eyes and some were sensed by Luang Poo Pan’s soul. The main content of the stories presented the issues about demoniacal people, exorcising rite, haunted placed, guardian spirit and talisman. The purposes of disclosing these issues because Luang Poo Pan would like to warn the new generation to behave and do activities in daily carefully. He emphasized that invisible things do not mean that they are not members of human’s world.

5. Conclusion

All written stories completely served the writer’s purposes. The writing styles were along with Systemic Functional Grammar Theory, especially genre and register. The genre-based approach found in the note comprised of report genres and recount genres. The register disclosed that the titles of each story revealed directly what it was about and correspond to the content. It also revealed the status of the writer that was higher than the receivers. The channel of communicating was writing. In addition, some old words, ceremonies, festivals, beliefs and activities in the former time were changed at the presented. Some were disappeared and some were changed by details of performances and meaning. Especially, some of them might be unbelievable for new generations.

Discussion

The objectives of the research were disclosed as follows:

1. Based on Systemic Functional Grammar, the personal note written by Luang Poo Pan, an honorable Buddhism monk, was correspond with Genre-based approach, especially the report and recount genres. It might be concluded that the theories come from human’s nature actions. Then the human’s actions were analyzed and finally set up as the theoretical rules. After that, educated people consider the activities, such as good writing forms should follow the rules. It might say that human set up the rules to control themselves.

2. Culture: some traditional cultures seem to be disappeared from the modernized social activities. New generations of ASEAN Community might not know or believe the traditional cultures and issues. These valuable traditional things might be not aware and realized by the later people. The cultural decay is occurring every minute. Some cultures may be kept but it is
quite certain that the details and meaning to the community members might be different from the former ones.

3. Comment. The note disclosed that there were parallel dimensions. One is a visible dimension and the other is invisible dimension. Some of these supernatural appearances mentioned in the note, such as, the host spirits on the top of Phoo Kraduang Mountain, a National Park. The super natural issues, mostly found by strictly practice of soul. According to Buddhist way, soul does not die but the physical body only. The invisible things, according to Buddhist belief, seem to be like a scientific energy: X-ray. We can see the energy but we can prove them. Luang Pu Pan recorded all the things met and seen during his past experiences because he would like to warn the people to behave. For the question if the stories in the note should be believed. The research would like to say that a hundred percentage with no questions.

4. The content in the note could tell the history of politic issues in the past, such as Lan Chang Province once belonged to Thailand, now is a neighbor area which is occupied by Laos, PDR.

Recommendation

The content of the note could lead to other issues such as history, geography, economics, and so on. Some traditional rites and talisman of Buddhist’s believes should be studied thoroughly weather they are an inherit belief or Buddhist belief.

6. References

Cooperative Learning Process Patterns with Distance Learning Information Technology (DLIT)

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Abstract

The policy of the Ministry of Education has extended the distance education project by using satellite (Distance Learning Television: DLTV) from Kai Kang Won School to small sized schools across the country since 2014. According to survey reported in 2015 from office of the Basic Education Commission, the satisfaction from students, teachers, and parents showed in high level (98%) for conducting courses with DLTV and DLIT.

This study aims to analyze the data to investigate the suitable ways for the cooperative teaching patterns with Distance Learning Information Technology (DLIT) from teachers in 14 schools in the district’s Board of Education in Nakhon Sawan province and Uthai Thani province.

The results showed that all sample schools are ready to support teaching methods with DLTV and DLIT which already have equipments and receiver boxes. The best advantage of these teaching activities for students has been taught by instructors who are competent in specific field. The next advantage is to reduce the problems of insufficient teachers in particular disciplines. Third, its supports self learning for students learn anytime, and they can study multiple times or extra learning in particular lessons is needed.

The limitation of activities was students require teachers to control classroom in all time and this activity do not give feedback to the students immediately. The student cannot asked questions on the issue. Next, the class time is limited and the lack of using computer equipments. The teachers lack of computer skills to solve the problems.

The results of this research were discussed in this paper and this is part of the research on the development of learning activities in cooperative learning with distance learning information technology (DLIT).

Keywords: Cooperative learning, Distance learning information technology (DLIT).

1. Introduction

The policy of the Ministry of Education has extended the distance education project by using satellite (Distance Learning Television: DLTV) from Kai Kang Won School to small sized
schools across the country since 2014. According to survey reported in 2015 from office of the Basic Education Commission, the satisfaction from students, teachers, and parents showed in high level (98%) for conducting courses with DLTV and DLIT and the advancement of technology making information and knowledge which are widely used in industries. In particularly, the study focused in utilized the computer. The information gathering in a single data source allowed students to learn by themselves to help in producing communication, learning interesting for learners, and instructors are scarced and facilitated learning so that students can study in anywhere and any time with computer.

In the present, a large school’s plans are teaching as the medium of teaching quality. It has not the knowledge of the institutions to the others because the course is taught in the classroom only. The students are not managed to learn equally. So that teachers in large schools can transfer knowledge to learners in remote correctly. We should have a plan for teaching activities to teaching styles that is right for distance teaching and benefits.

**Purpose**
To analyze the data to find out the suitable ways for the cooperative teaching patterns with distance learning information technology (DLIT)

**Population and sample**
1. The populations in this study were teachers in Large Schools in the Education Service Office Area in Nakhon Sawan province and Uthai Thani province.

   2. The sample in this study were the teachers who teach with Distance Learning Information Technology (DLIT) in 14 schools in the Education Service Office Area in Nakhon Sawan province and Uthai Thani province.

**Variable**

**Independent Variables**
Cooperative Learning Activities with Distance Learning Information Technology (DLIT).

**Dependent variable**
1. Advantage and the limits of Cooperative Learning Activities with Distance Learning Information Technology (DLIT).

   2. Suitable ways for the cooperative teaching patterns with distance learning information technology (DLIT)

**2. Methodology**
This research is a survey research. The use of questionnaire as a tool to collect data which to investigate in order to specific purpose as follow..

1. To interview the teachers in 14 schools in class with Distance Learning Information Technology (DLIT)

   2. To analyze the data in exploring the suitable ways for the cooperative teaching patterns with Distance Learning Information Technology (DLIT)
3. Results and conclusions

1. Cooperative Learning Process Patterns with Distance Learning Information Technology (DLIT) which have 3 process patterns are,

   **Teacher** is The teachers who teach Cooperative Learning Activities with Distance Learning Information Technology (DLIT).

   **Student** is The Students in Class that teaching with Cooperative Learning Activities with Distance Learning Information Technology (DLIT).

   **Technology** is Distance Learning Information Technology (DLIT).

![Figure 1 Process Patterns of DLIT](image1)

2. Analyze the advantage and the limits of cooperative teaching activities with Distance Learning Information Technology (DLIT).

   1. The advantage of cooperative teaching activities for students were
      1.1 To have been taught by instructors who are competent in specific field.
      1.2 To well reduce the problems of insufficient teachers in particular disciplines.
      1.3 It supports self learning for students in anytime, and they can study multiple times or extra learning in particular lessons is needed.

   ![Figure 2 Advantage of activities](image2)
2. The limitation of cooperative teaching activities for students were
2.1 The students require teachers to control classroom all the time and this activity
does not give feedback to the students immediately.
2.2 The student cannot ask questions on the issue.
2.3 The class time is limited.
2.4 The lack of skills using computer equipments.
2.5 The teachers lacks of computer skills to solve the problems.

![Limits of activities](image)

**Figure 3 Limits of activities**

**Table 1. The compare of the advantage and limits of cooperative teaching activities.**

<table>
<thead>
<tr>
<th>Advantage</th>
<th>limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To have been taught by instructors who are competent in specific field</td>
<td>1. The students require teachers to control classroom all the time and this activity doesn’t give feedback to the students immediately.</td>
</tr>
<tr>
<td>2. To well reduce the problems of insufficient teachers in particular disciplines.</td>
<td>2. The student can’t ask questions on the issue.</td>
</tr>
<tr>
<td>3. It supports self learning for students anytime, and they can study multiple times or extra learning in particular lessons as needed.</td>
<td>3. The class time is limited.</td>
</tr>
<tr>
<td>4.-</td>
<td>4. The lack of skills using computer equipment.</td>
</tr>
<tr>
<td>5.-</td>
<td>5. The teachers lacks of computer skills to solve the problems.</td>
</tr>
</tbody>
</table>
4. Conclusion

To conclude, in this research, Cooperative Learning Process Patterns with Distance Learning Information Technology (DLIT). The results show that using Distance Learning Information Technology (DLIT) classroom in the sample schools, which are ready to support teaching methods with DLT and DLIT are already have equipments and receiver boxes and have 3 advantages 5 limitation. This is a study of teaching and learning with DLIT and this technique should explore in more courses. Moreover, students will gain knowledge through experience and the experience came from doing by themselves. We should support equipment and technology for the different teaching as a solutions to meet the problems in schools.

5. Acknowledgment

This research was funded by the Faculty of Education, Nakhon Sawan Rajabhat University

6. References

Factors Affecting the Practical Skills of Grade 6th Students in Learning Computer of Schools under Nakhon Sawan Municipality

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Abstract

The aims of this research were 1) to investigate the practical skills in learning computer of Grade 6th students in schools under Nakhon Sawan Municipality, 2) to investigate the factors of students, teachers, schools, and families that affect the practical skills in learning computer of Grade 6th students in schools under Nakhon Sawan Municipality, and 3) to synthesize the practical skills in learning computer of Grade 6th students in schools under Nakhon Sawan Municipality. The research material was practical skills in learning computer. The 240 Grade 6th students were used as and sample group which were selected by cluster sampling from Grade 6th students of 8 schools under Nakhon Sawan Municipality: Wat Shai Tay School, Wat Pak Nam Pho Tai School, Wat Promjariyawas School, Wat Woranatbunphot School, Wat Chong Kho Kiree Wararam School, Wat Jom Kiree Natphot School, Wat Sukrotwararam School, and Wat Shai Neur School. The research finding were, 1) the highest mean was teachers factor (x̅ = 4.09, S.D. = 0.75 (followed by schools factors (x̅ = 3.66, S.D. = 0.98 (students factor) (x̅ = 3.92, S.D. = 0.74) and families factor x̅ = 3.21, S.D. = 1.14 respectively. This results will lead to the guideline for computer teachers and school administrators in solving practical skills problems in learning computer.

Keywords: Practical skills, and learning computer

1. Introduction

Now Schools have many computer classes because they knows about the importance of technology in computer classes and the technology constantly evolving and very fast. Many schools found that teaching students computer grade 6 are still unable to take action. They lack the skills to run Microsoft Office. Printing documents or catch a mouse cursor. Unknown application infrastructure Unable to open up another program available. The research study was to study the factors that affect. In learning computer skills of students in six years under Nakhon Sawan.

Objective

1. To investigate the practical skills in learning computer of Grade 6th students in schools under Nakhon Sawan Municipality,
2. To investigate the factors of students, teachers, schools, and families that affect the practical skills in learning computer of Grade 6th students in schools under Nakhon Sawan Municipality,

3. To synthesize the practical skills in learning computer of Grade 6th students in schools under Nakhon Sawan Municipality.

**Population and sample**

1. The population in this study were The Grade 6th students were used as and sample group which were selected by cluster sampling from 556 Grade 6th students of 8 schools under Nakhon Sawan Municipality.

2. The sample group in this study were The 240 Grade 6th students which were selected by cluster random sampling from Grade 6th students of 8 schools under Nakhon Sawan Municipality:
   - Wat Shai Tay School,
   - Wat Pak Nam Pho Tai School,
   - Wat Promjariyawas School,
   - Wat Woranatbunphot School,
   - Wat Chong Kho Kiree Wararam School,
   - Wat Jom Kiree Natphot School,
   - Wat Sukrotwararam School, and Wat Shai Neur School.

**Variable**

The opinion of factors affecting the practical skills of grade 6th students in learning computer in 4 factors are

1. Students factors
2. Teachers in the teaching factors
3. Educational factors
4. Family factors

**Research material**

1. The research material was practical skills in learning computer. The 240 Grade 6th students were used as and sample group which were selected by cluster sampling from Grade 6th students of 8 schools under Nakhon Sawan Municipality: Wat Shai Tay School, Wat Pak Nam Pho Tai School, Wat Promjariyawas School, Wat Woranatbunphot School, Wat Chong Kho Kiree Wararam School, Wat Jom Kiree Natphot School, Wat Sukrotwararam School, and Wat Shai Neur School.
The conceptual framework of the research

![Figure 1 conceptual framework](image)

### 2. Methodology

The survey study by using questionnaire in the 4 research stage.

1) Investigate the teachers who teach in computer class in 8 schools under Nakhon Sawan Municipality.

2) Analysis the factors was practical skills in learning computer.

3) Survey and gathering factors affecting the practical skills

4) Analysis the factors affecting the practical skills of grade 6th students in learning computer.

### 3. Result

1. Analysis the factors was practical skills in learning computer in 4 factors, Students factors, Teachers in the teaching factors, Educational factors and Family factors shows in The Table 1.

<table>
<thead>
<tr>
<th>Factors Affecting the Practical Skills of Grade 6th Students in Learning Computer of Schools Under Nakhon Sawan Municipality</th>
<th>$\bar{x}$</th>
<th>S.D.</th>
<th>percent</th>
<th>Interpreted</th>
<th>order</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students factors</td>
<td>3.66</td>
<td>0.98</td>
<td>73.26</td>
<td>Max</td>
<td>3</td>
</tr>
<tr>
<td>Teachers in the teaching factors</td>
<td>4.09</td>
<td>0.75</td>
<td>81.86</td>
<td>Max</td>
<td>1</td>
</tr>
<tr>
<td>Educational factors</td>
<td>3.92</td>
<td>0.74</td>
<td>78.53</td>
<td>Max</td>
<td>2</td>
</tr>
<tr>
<td>Family factors</td>
<td>3.21</td>
<td>1.14</td>
<td>57.86</td>
<td>medium</td>
<td>4</td>
</tr>
</tbody>
</table>
The research finding were, 1) the highest mean was teachers factor ($x\bar{=} = 4.09, S.D. = 0.75$) (followed by schools factors ($x\bar{=} = 3.66, S.D. = 0.98$) students factor) ($x\bar{=} = 3.92, S.D. = 0.74$ and families factor $x\bar{=} = 3.21, S.D. = 1.14$ respectively). This results will lead to the guideline for computer teachers and school administrators in solving practical skills problems in learning computer.

4. Conclusion

This results will lead to the guideline for computer teachers and school administrators in solving practical skills problems in learning computer.

5. References

Needs Assessments of a Saving for Production Group to Develop Potential Community Strength: Using SWOT Analysis and A-I-C Technique

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Abstract

This research objectives aimed to need assessment with the situation problems of developing potential management of the community strength: A case study of the saving for production group (SPG). The data collection using SWOT analysis and A-I-C technique. This holistic to developing potential management community strength for implementation to help the researcher knew the problem of SPG. The methodology research used of activities by participation action research (PAR). The recommendation of this research; to reduce of bond rate for members, should have call centers unit in SPG’s office and manage the accounting information systems (AIS). The types of saving have to management especially, housewife group in SPG. The SPG should inform to the members about performance.

Keywords: need assessment, develop potential management, savings for production group

1. Introduction

This article had a part of study with research the topic of “Participatory action research for development of potential administration of community for product group tambon thapho, Uthaitani”. The saving for production group is one of the micro finance organizations of Thailand which operates financial activities in providing services to its members gathering from the villagers in order to assist one another. (Thanes Sriwichailamphan and Thunyawadee Sucharidtham, 2016) In order to create the foundation of the country development, the group encourages all members to economize and save the money together every month, reinforces the ability, and utilizes the resources in developing their own quality of life. This article mainly aimed to examine need assessment and the situation problems to develop potential management the community strength. A case study the saving for production group (SPG). To summarize the data collection: SWOT Analysis, A-I-C technique.

The objective 1: This research was study the need assessment and the situation problems to develop potential management the community strength: A case study the saving for production group (SPG).

Part I: The results of need assessment and the situation problems to develop potential management the community strength: A case study the saving for production group.

1. The need assessment of the saving for production group
The demand side of the board and members have agreed that. To gain knowledge about good management include of requirements development. The good management of their savings to the manufacturing district pose. The details are as follows:

1.1 Adding to the welfare of children - for more people.
1.2 Awareness of sending loan to the borrower. Moving ahead
1.3 Urge savings Funding and villages all add up.
1.4 Saving Group wants to build more solid foundations.
1.5 Future urge everyone in the community is saving every household in the community.

Directors have integrity - integrity in finance.

1.6 Training young minds to the truth - to save money.
1.7 Workshops to educate members of the team to release the youth to make more savings.
1.8 To increase scholarships and increased medical costs.

2. The activities had this research that will lead to development the saving for production group summarized as follows:

2.1 Group coaching career should be able to work as a knowledge or profession. The extra income in their spare time.
2.2 Provide training to trainers the creation of a leisure
2.3 Funding savings to savings. Everyone involved has invested (An Abiola, MO Egwuwalo, 2010) The savings are positively correlated to investment affects productivity growth in the economy to allocate staff and community papers. Natural disasters in the community
2.4 Manage the budget from other sources.

Part II: The problems of the saving for production group

The results of development of better management of savings products: a lack of computerized accounting. The cause of the problem is the lack of personnel to do it. Because most are elderly and lack of person transfer knowledge, also the SPGs activities gone to promote the learning process of local people for developed the individual, family and community by teaching person to help himself and others in the economic society, thrifty and saving. (Insawaang, 2000; Tangmelap & Nuanlaor, 2001; Chotechuang, 2001; Bureau of Community Capital and Financial Organization Development, 2010) The objective 2: The technique was to collect interesting data: A case study the saving for production group (SPG). This presents two ways.

1. SWOT Analysis techniques to analyze potential corporate / community

The SWOT analysis is a technique of the organization or community and forecast the situation in the community as well as within the community itself. The analysis will provide information leading to the decision. The communities had target. To carry out activities to what needs to happen under circumstances that projected.

The example, the analysis SWOT Analysis research are as follows (Nawaporn prasomtong, 2014), as shown at (Table 1)
Table 1 The result finding of using SWOT Analysis

<table>
<thead>
<tr>
<th>Strengths : S</th>
<th>Weakness : W</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Members are honest, trustworthy</td>
<td>1. The members did not cooperate in the meeting.</td>
</tr>
<tr>
<td>2. Members share responsibility</td>
<td>2. The children in the community did not cooperate.</td>
</tr>
<tr>
<td>3. Members unity sympathy and understanding</td>
<td>3. The members not leave a comment at the meeting.</td>
</tr>
<tr>
<td>4. There is a great community welfare aid That said, the benefits are indirect compensation or benefits that result. (Deja Dechawattanapisarn, 2016 : 248)</td>
<td>4. Youth is rarely seen in the importance of savings.</td>
</tr>
<tr>
<td>5. The leadership strengthened and sacrifice for the common good. The Women’s leadership and members of the parish pose the most females than males. This is consistent with research (Chayaporn nonngkaew, 2010) and found that workers who are mostly women, are crucial to the development of the required participation. This will result in higher overall productivity of labor groups and organizations. (Stehen tap, 2016 ; The executive Board of the International Monetary Fund (IMF), 2016) There is support for the implementation of the various groups in the district have the opportunity to pose and support development in all areas, with women as leaders.</td>
<td>5. Some members irresponsible.</td>
</tr>
<tr>
<td>6. The temple was the center of work.</td>
<td>6. The Committee is not new.</td>
</tr>
<tr>
<td>7. A district council, community organizations pose to link the activities of members.</td>
<td>7. The member loan does not meet the time limit.</td>
</tr>
<tr>
<td>8. The saving for production group had stability.</td>
<td>8. The member lack of mutual trust.</td>
</tr>
<tr>
<td>9. The SPG had a chairman of the board for good management.</td>
<td>9. The community members had little training to acquire knowledge.</td>
</tr>
<tr>
<td>10. The SPG had loans with members.</td>
<td>11. The SPG has been received numerous awards, including the performance, and transparent.</td>
</tr>
<tr>
<td>11. The SPG has been received numerous awards, including the performance, and transparent.</td>
<td>12. The saving public assistance benefits in the budget include the villages pose a village of 5,000 baht each year to develop the village.</td>
</tr>
<tr>
<td>12. The saving public assistance benefits in the budget include the villages pose a village of 5,000 baht each year to develop the village.</td>
<td>13. Making the management accounting system.</td>
</tr>
</tbody>
</table>
Opportunities : O

1. Nakhon Sawan Rajabhat University as a guest speaker to educate.
2. Tambon administrative pose supporting facilities, personnel, equipment such as a computer, desk and chair, etc.
3. Get support from organizations in the community such as volunteers. The community Development Center. Support occupations, etc.
4. Get links from provincial policy.
5. Recognition from outside organizations, such as Community Development District Nong Khayang. To deliver lectures on their savings.
6. The state agencies, such as community care support.
7. There was an opportunity to open markets such as green market square, the pedestrian district Uthai, etc.
8. In recognition and support of the garment. pose as a garment center.

Threats : T

1. The lack of savings The rice mortgage policy failure.
2. The economic downturn also expensive. High cost of living, etc.
3. The lack of cooperation in the development of the community.
4. The policy rule is not linked to the public.
5. The natural disasters such as floods, droughts, storms, etc.

2. A-I-C Technique

The A–I–C technique was a technique developed from the concept of private institutions in organization for development an international institute (ODII) by Ms. Turid Sato and Dr. William E. Smith, this process has been tested and released in conjunction with the Institute ODII. The Thailand development research Institute (TDRI) and the Association of Population and Community development (PDA). (Khanchit puttaraksa, 2011: 23) The results showed that the technique AIC using a process that had the potential to empower and encourage acceptance of people, home, community development and had the potential to expand the technical AIC applied for brainstorming sessions to develop the village’s technical brainstorming on the importance of the ideas and contributions of members. The community was on the basis of equality, a process that brings people-centered development. The part of this research, this technique used to collect information from residents who are members of the group savings for manufacturing, which was a type of business. Using this technique the researchers used in the study of the business case was saving for production group, which has manufacturing (Sittinat praputnitisat, 2003) was studied as well. However, most are found in the basic science community (community base) where the researcher was used to collect data for the analysis and presentation of information. Used to store information and procedures described below.

The activity of research using the brainstorming sessions participatory (A-I-C), also known as the A-I-C. The word Appreciation (A) Influence (I) Control (C) refers to a meeting with the method and the opportunity for those in attendance had the opportunity to communicate. The exchange of information, knowledge and experience. This will result in a better understanding of
the problems, limitations, needs and potential of the people involved in the process of brainstorming meetings to address the issue and find ways to develop their creativity. When action is required by the procedure. The contributions from the conference will come from the minds of everyone in attendance. The processes and procedures in conference meetings to brainstorm ideas to develop the village into the meeting, the village that can be used as a tool to motivate the villagers or the villagers in groups to express their opinions and co-orientation to develop the village. The conference process is an activity that is required to perform the ongoing respectively (Table 2)

Table 2 The summarizes in process used A-I-C technique

<table>
<thead>
<tr>
<th>Step</th>
<th>Time</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>A - 1</td>
<td>15 minutes</td>
<td>Understand the situation in the reality, The mood began to reconsider the idea of art. The relationships with others not serious.</td>
</tr>
<tr>
<td>A - 2</td>
<td>20 minutes</td>
<td>Make create a vision expected future (ideal vision or scenario), a resolution that everyone understands the expectations and wishes together from the start.</td>
</tr>
<tr>
<td>I - 1</td>
<td>30 minutes</td>
<td>Devised a strategy (solution design) is a process that everyone has to show their power. If experience and contribute their ideas logically. They has been accepted Be proud If others better I agree as well, This task belongs to everyone from the beginning.</td>
</tr>
<tr>
<td>I - 2</td>
<td>30 minutes</td>
<td>Identify priority activities. They was a process that everyone experiences to show others your advantage. The activity was regulated success.</td>
</tr>
<tr>
<td>C - 1</td>
<td>30 minutes</td>
<td>The responsible planed of organization or group. They had a process that everyone has their own analysis. The power capacity and the mission to co-operate in the matter are available.</td>
</tr>
<tr>
<td>C - 2</td>
<td>30 minutes</td>
<td>Plan / activities / projects (Action Plan), this procedure must be co-written programs / projects.</td>
</tr>
</tbody>
</table>

3. Conclusions

The SWOT analysis and A-I-C technique in terms of the techniques or tools to be used in research activities, practical workshops and participatory. This foundation of encouraged all stakeholders to consider the social, political, cultural as well as the economic and technical factors simultaneously, which affect the decision on the potential impact on the organization and the community (Nat Luxchaigul, 2014 : 168) Thailand has the important role in the development and empowerment of local people.
4. References


Product Innovation Mixed Media on Canvas from Waste

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Abstract

Creative Products Mixed media on canvas from waste materials. Has the following objectives: 1) to study materials available online. 2) to create products Mixed media on canvas from waste materials. 3) To assess satisfaction with the products from waste materials, mixed media on canvas. 4) To bring awareness to integrate undergraduate instruction in the classroom. Department designed and deployed in outreach to the community. There is no way to conduct the research. Step 1, select materials are available online. Step 2 of the process, increase the value of waste materials and experimental work creatively mixed media on canvas. Step 3 put the knowledge to integrate the teaching and academic community. Step 4 assessment by questionnaire.

The research found that. There are a number of materials in different locations. We were the only non-hazardous material. Materials such as natural and synthetic materials to create a product, mixed media on canvas. The satisfaction rating for overall product at a high level. The materials used in the creation of environmentally friendly at a high level. We make use of waste materials, waste reduction. Design Forms of creativity. At a high level it depends on the imagination of its author. The usefulness can be used for teaching and outreach to the community. In a very simple way to do this is not complicated. And everyone is happy to do.

Keyword: invention, Mixed Media Product, Waste, canvas

1. Introduction

Global warming is a global temperature rise of human activities cause greenhouse gases. Heat cannot be removed from the atmosphere. The temperature rise. The impact of global warming. As polar ice melts, Sea level rise, born cyclone, Changes in natural, Germs spread, Animal migration, drought, wildfire, many extinct creatures. The temperature is changing every moment, as we meet in conditions of rain flooding. Rain does fall season, Drought, Has reduced the amount of water streams in the summer or even earthquakes. Another aspect in the Western Hemisphere People are confronted with global warming. Body heat unbearable, People in Europe As well as different areas of the world has killed thousands. These phenomena scientifically identified as "global warming". As a result, emissions of carbon dioxide and other gases. Featuring trap heat to the atmosphere. These gases are gathered into a thick blanket, trapping the heat of the sun. And global temperatures are warming up. The more of these gases increase. Heat will increase
accordingly. The phenomenon, which may result in some of these areas become desert. Beings who cannot adapt will become extinct. Some areas may experience flooding. Polar ice melt on the high peaks. The amount of sea rise. Coastal areas affected. And the public could see the heat waves that are destructive force than ever to find out. Event of natural disasters occurring alarms are what our world. Then just seconds after all the junk out of the door away. It is affecting the social environment. The worse the crisis becomes more accumulated evil of the world. Somthai Wongcharoen (2552: Preface). If we let it happen. "Global warming" is like this. I believe that potentially phenomenal reality. Czech world’s heart again, of course. The best solution is. Everyone needs to reduce energy consumption. As a source of pollution to global rebalancing and help reforestation. So naturally restored as soon as possible. Otherwise, if more than 10 years, we may not be able to get back into the body. Current waste a lot. Globally, it has the same problem.

The decline was caused waste and causing pollution. Origin germs, Disposed of by burning in incinerators and landfills, the environmental sustainability minimal. Landfill is the final disposal method for unused materials that can be reused again. For household waste in there a lot. In a way that does not cause a negative impact on the environment and society has become a key issue.

The research suggests that, there are many waste materials. We can waste the average person sees no value. The initiative is the product of mixed media on canvas. The locals and students who are interested. Can be produced, Thus increasing the value of waste materials. To products. It also creates jobs Create jobs for residents and students have a job next term. As a result, people will have a job. The economy of the country improved. You can also compete with other ASEAN countries have. This also applies to the integration of teaching students with academic design. As well as outreach to the community.

2. Method
The concept of research.

Figure 1. Conceptual Framework for research.
Objective

1. Scope of the area Nakhon Sawan, Nakhon Sawan Rajabhat University and in the community.
2. The scope of content products Mixed media on canvas from waste materials design.

The usefulness

3. The population of this research. Include the general public in the city. Nakhon Sawan. And Nakhon Sawan Rajabhat University students

Variables: Mixed media on canvas from waste materials.

Variable: Satisfaction in the form of innovative products, materials from mixed media on canvas.

Terminology

Creative means to create something new. The initiative is unique. Valuable art to meet the needs of self and society.

Mixed Media Product Refers to the work created by the two types of composite materials to make a blend that works in the same piece.

Waste refers to materials that are not used by the consumer on a daily basis. Natural materials such as and synthetic materials

Canvas refers to devices that are used to create mixed media. It is a rectangular the fabric is stretched taut.

Tools used in research

Research on the creation of waste products, mixed media on canvas. The researchers classified as a research tool.

1. The instruments of the general state of waste materials. Data were collected through interviews and photo diaries message. And information from the Internet

2. Satisfaction of all three specialists. The research was conducted. Once the questionnaire is complete, check the consistency between question on what to measure (Index Item of Conguent: IOC) to consider the draft questionnaires for the purposes listed or not, which the experts.

2.1 Mr. Rapeepat Munporm Lecturer, Department of Design Faculty of Agricultural Technology and Industry Nakhon Sawan Rajabhat University (Specializing in the arts, mixed media).

2.2 Mr. Wattanachot Tungateja Chairman Quartet with limited graphics. Bangkok (Specializing in design, art, mixed media).

3. The sample in question, By ascertaining the needs of those interested in creating products from waste materials, mixed media on canvas.

4. Measurement of consumer satisfaction with the products from waste materials, mixed media on canvas. By using a questionnaire to assess satisfaction with all three sections Chapter 1 Overview of the respondents. 2 Comments to consumers toward the products mixed media on canvas from waste materials in form and function. The third suggestion.
Data collection

Research Study the researchers collected data on products from waste materials, mixed media on canvas. The following information

1. Collection of data from documents, books, magazines, the Internet is divided. Information materials, multimedia design and product development. Economic Community and related research

2. Data from the actual space. The interview and photograph the waste by the roadside, home schools, parks, hotels, logistics centers, office Waterway bedroom, bathroom, dining room, living room and so on.

3. Data compiled from inquiries from the study of products from mixed media artist or art teacher. Having talked with people who have expertise in product design. Using notes, take pictures and have a pool on how production problems caused by the products. As well as techniques to create products for the aesthetics. And also data from the study in a foreign country.

4. Gather information from the maker of the questionnaire needs to work to create multimedia products.

5. Gather information from experts to ensure consistency between questions with something like a (IOC).

6. Collect information on exercises based on the results of success. And problems in making and taking notes and photographing the process of producing them.

7. Crawl satisfaction of consumers with the products from waste products, mixed media on canvas 100 using a simple random (Simple random sampling).

8. The collected data were analyzed using computer software. And processing and statistical summary.

Process research

<table>
<thead>
<tr>
<th>objective</th>
<th>thinking framework</th>
<th>The information / resources</th>
<th>The tools used to collect data.</th>
<th>Data analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To study materials available online.</td>
<td>- The general condition of the waste materials are available online at places such as houses, schools, parks, roadside hotels, logistics centers, office Waterway bedroom, bathroom, dining room, living room and so on.</td>
<td>- Homeowners female workers in factories. officer</td>
<td>- query</td>
<td>- The information / resources</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- researcher</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- camera</td>
<td></td>
</tr>
<tr>
<td>2. To create products Mixed media on canvas</td>
<td>- Experimental artificial materials from mixed 1. Mr Rapeepat Munporm</td>
<td>- expert (Natural material)</td>
<td>-Waste (Natural material)</td>
<td>conclude</td>
</tr>
</tbody>
</table>
from waste materials. media on canvas and bring it to the experts.
- To the integration of teaching and learning in the classroom, both in theory and practice.
- Put your knowledge to use in training locals.

| 2. Mr. Wattanachot Tungejata | Synthetic material) |
| Undergraduates | - Canvas |
| Residents in communities | - glue |
| | - Pen |
| | - students |
| | - locals |

3. To evaluate the satisfaction of consumers of products from waste materials, mixed media on canvas.
- Evaluate products from waste materials, mixed media on canvas material, the design. And the usefulness
- Evaluate products from waste materials, mixed media on canvas material, the design. And the usefulness
- Evaluate products from waste materials, mixed media on canvas material, the design. And the usefulness

query
- average
- Percentage
- standard deviation
- conclude

The process of conducting research.

Figure 2 Schematic process research.
3. Results

1. Study materials are available online.

Spam problem is one big problem that we face in our day. A waste of waste resulting from the consumption of many defendants. The waste caused decline Defile A source of disease. Each step in the garbage disposal vary. Each method would affect the environment, almost. At present there is a lot of waste. Whether it is a home away from home, work, school, parks, on bridges or government buildings. The residues of these. Creativity can be built into products, souvenirs, toys and decorative use.

![Figure 3](image-url) There is a lot of garbage each day.

Common sources of waste materials sound materials Inside the houses we live in the bazaar street that runs River Park Stadium, railway station, bus station, hospital, salon seaside pad motorcycle repair shop, auto repair shops. The dam on the river and shopping etc. We need to use materials that are not toxic. Some materials that are dirty, we can be cleaned before it can be used to create the product.

![Figure 4](image-url) Sources of waste typically found at different locations.

2. To create products mixed media on canvas from waste materials

2.1 The research protocol By learning from those who know the books, the Internet and education experts. The waste We find places where we can choose materials that are not harmful to the product, be it paper, plastic, fabric, metal, glass and natural materials, and so on.

![Figure 4](image-url) Choose natural materials. Synthetic materials to create non-toxic products.
When we were coming up. We have prepared a sketch to canvas. Then use adhesive material needs. The beautifully decorated by the creative ideas of their own. It will be the product as we intended.

For example, the Map of Thailand Scrap paper waste

<table>
<thead>
<tr>
<th>Material used</th>
<th>1 canvas. 2. Glue 3. Scraps of paper.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedures</td>
<td>1. Drawing a map. 2. Apply glue on a piece of paper. Then taped onto a section of the North. 3. Apply glue on a piece of paper. Then taped onto a section of the South. 4. Apply glue on a piece of paper. Then taped onto a section of the East. 5. Apply glue on a piece of paper. Then put on as part of the Northeast. 6. Glue on a piece of paper. Then taped onto a central part. Decorative products will fulfill the requirements.</td>
</tr>
<tr>
<td>Benefits to</td>
<td>We can art, mixed media on canvas. (Map) to use in decorating a bedroom, living room and dining room.</td>
</tr>
</tbody>
</table>

![Figure 5. The work of students from integrating classroom.](image)

2.2 The research has led to innovative products. Mixed media on canvas from waste materials. The learner-centered teaching methods. A brainstorming And practicing. The teachers supervise. The applied learning course materials and manufacturing processes. Teachers focus on the students to take the material to be recycled worthless. In addition, students will create a product. This also saves costs and also proud of the contributions made.

![Figure 5. The work of students from integrating classroom.](image)
2.3 The research has led students to learn both theoretical and practical. After lessons, has used his knowledge to use in the classroom to introduce the participants with teaching.

![Image of mixed media creations](image)

Figure 6. The contribution of local people and those interested in receiving training.

3. To assess satisfaction with the products from waste materials, mixed media on canvas. The satisfaction of creating products from waste materials, mixed media on canvas, 100 people materials. Ranked first in the materials used to make products environmentally friendly. At a high level the mean \( \bar{x} = 4.25 \) with the standard deviation (S.D.) = 0.99. The two materials are suitable for the creation of mixed media on canvas. At a high level the mean \( \bar{x} = 3.64 \) with the standard deviation (S.D.) = 1.18. No. 3 materials can be developed as a profession in the community. Is moderate the mean \( \bar{x} = 3.40 \) with the standard deviation (S.D.) = 1.28. Design of the first forms of creativity. At a high level the mean \( \bar{x} = 4.01 \) with the standard deviation (S.D.) = 1.12. The shape of the two creations, mixed media on canvas interesting is moderate. The mean \( \bar{x} = 3.30 \) with the standard deviation (S.D.) = 1.49. Ranked third overall aesthetic appeal to the spectator. Is moderate the mean \( \bar{x} = 3.29 \) with the standard deviation (S.D.) = 1.31. The benefit is that one can use it as a souvenir. At a high level the mean \( \bar{x} = 4.08 \) with the standard deviation (S.D.) = 1.27. Ranked # 2 can be used in the interior at a high level. The mean \( \bar{x} = 3.56 \) with the standard deviation (S.D.) = 1.41. No. 3 can only be used in teaching and service to the community. Is moderate the mean \( \bar{x} = 3.41 \) with the standard deviation (S.D.) = 1.41. Assessment found that most people are satisfied with the products of creative products from waste materials at a high level. The average is 3.66.

4. Conclusions

1. Study materials are available online. That is a lot of waste. Like a home away from home, work, school, park or public place or on the overpass. The researchers found that materials such as glass, paper straw bag candy shell wire tube cap soft foam boards, bamboo leaves, branches, wood, glass and many more. In choosing these materials are used. We have to choose
materials that are not toxic or dangerous to do so. Choose materials that are suitable only put it on canvas.

2. The products mixed media on canvas. The researchers selected materials to create a product that is non-toxic. By studying how to make a book from an internet expert. Bringing waste into synthetic materials and natural materials used to make Please use the following steps: The first step to prepare materials, The second step was the creative design work to be done. The third stage Material posted on canvas using glue as a binder tep. Four Decorative It has products that fulfill the requirements. Then put that knowledge to use in teaching undergraduates. Department of Materials and Manufacturing Processes Department of Design Nakhon Sawan Rajabhat University Both theoretical and practical Then the researchers and students together to provide training for outreach to educate the community.

3. Evaluation of satisfaction with the products from waste materials on canvas. By using split was found that the material is one material used to make environmentally friendly products at a high level. Because we do not have to buy the materials at an affordable price. We use materials that are not used to doing. Reduce production costs and reduce the use of materials. This reduces the amount of garbage that day there will be more in the present, too. The two materials are appropriate for the creation of mixed media on canvas material because we live in a material that is not harmful and can synchronize with an adhesive material to stick on the canvas in line with the (successor glory. Saelee. 2555) used a glue binder fibers of plants to make panels Design is one form of creativity. At a high level doing this work the concept can be put into the work piece by piece may be a single layer with no originality. The second form of creative work, mixed media on canvas. At a high level the shape is not large and not too small. Compact Can be used in the interior buildings are also interesting. Because the material to make products that are worthless. The usefulness the first can be a gift. At a high level because the product is the right size, light weight, there is a unique work of art itself. A novelty there is a unique piece. No. 2 can be used in the interior. At a high level the products are beautiful, durable, and attractive, fit to be used to decorate the living room and bedroom, bathroom and living room.

Suggestion

1. Educational materials as waste. These waste materials are synthetic and natural materials. To clean and decorate it onto canvas using glue as a binder. Media can be mixed Researchers saw that the frame and the canvas. It will replace materials such as wood, tile and more.

2. Due to the current economic conditions Materials are used to manufacture a product in different ways. To meet the needs of consumers. Materials made in lower volumes and higher prices. Take the waste to replace the original material. Making it possible to reduce the cost of production.

3. In addition to bringing awareness to integrate the teaching of undergraduate and academic services to the residents of the home. You can put that knowledge to use integrated teaching in secondary and elementary education.
4. The process of this research Nakhon Sawan Rajabhat University and lead researcher of the project, students were learning Hebrew together. Knowledge can be utilized in accordance with the teaching mission of higher education institutions. For local development.
5. The results of the research can be published in other national or international basis nations.
6. Published in academic journals as knowledge in further research.
7. The results of the research leading to commercial production.

5. References
Study on Color Kinetic of Ripe Mango in Hot Air Drying

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Abstract

Color is one of the most important quality attribute for acceptability of dried mango. In this research, the kinetic of color changes for ripe mango in hot air drying process were evaluated as a function of time and temperature at a constant air velocity of 1.5 m/s. Hot air drying process was performed in the range of 50-70°C air temperature. The drying kinetic was found from drying curve that was the ratio of moisture ratio (MR) changes to drying time. Different values of three hunter color parameters (L*, a* and b*) were used to investigate the sample color during drying process for color kinetic study. The total color difference (∆E*) was calculated from the hunter color parameters and used as the indicators for color change of the samples. Then, the rate of the sample color change was calculated from ∆E*. From this result, it represented that the color of the sample was affected by the drying temperature. The maximum color changes of the final product at 50, 60 and 70°C air temperature were 15.02, 8.06 and 11.07, respectively. Considering the kinetic of drying and color, they revealed some physico-chemical mechanism of the sample color changes during the drying process.

Keywords: Hot air drying, Color kinetic, Total color difference, Drying rate.

1. Introduction

Mango is a tropical fruit that has a very high demand of the world market in both of fresh and processed (Nambi et al., 2015). Thailand has suitable geography for planting the mangoes throughout the year. Thereby, Thailand is one of the world's largest mango exporter. In the year 2552, Thailand exported mangoes up to 1,600 tons (Department of Agriculture, 2554). Mango is rich in nutrients including vitamin B6, vitamin A, vitamin C, potassium, magnesium, zinc and antioxidants. Moreover, they have a delicious taste and aroma that making it is widely consumed (Nambi et al., 2015; Pu and Sun, 2015; Rungpichayapichet et al., 2015; Rungpichayapichet et al., 2016). The deterioration of mango will begin after trimming and ripening, storage temperature also accelerated the deterioration faster. Currently, there are many ways to extend shelf life of mango such as solar drying, microwave-vacuum drying and hot air drying (Pu and Sun, 2015).

Drying is a mass transfer process which affects to water activity reduction (ref). The most popular and easy drying process is tray drying. In this system, heating medium is heated by heater.
Then, the flow of hot air is passed through to the sample and causes the evaporation of water (ref). So, this process requires two things; high temperature and long time. Typically, the drying at high temperature results to product changing such as shrinkage, vitamin loss, aroma loss, porosity and color changes (Aguiar et al., 2012). The important aim of drying process is making the product look like a fresh as possible (Kowalski et al., 2013; Russo et al., 2013; Timoumi et al., 2007).

Color in the form of $\Delta E^*$ is a key parameter for indication the quality of dried product and drying process (Chen et al., 2015). Enzymatic browning reaction is a serious problem in mango because of the reduction of commercial value by the brown color occurring and make them unacceptable from the consumer (Bustos et al., 2015; Khan et al., 2016). The enzymatic browning reaction will occur in bruised mangoes by sorting and chopped step since polyphenol oxidase (PPO) reacts with oxygen. Accordingly, the high $\Delta E^*$ in drying process refer to the low quality dried product. The factors affecting to the color changes are temperature and air velocity. The aim of this work is to study on the effect of the drying temperature, which affected to the color changes in the hot air drying process.

2. Materials and Methods

Samples preparation

Mangoes from a local market in Nakhon Pathom (Thailand) were used as sample for the study. Samples were peeled and cut into a cube shape with a 20 mm width, 20 mm lengths and 5 mm thickness. The initial moisture content of mango was 422.19% (dry basis) which was determined by AOAC method (AOAC, 1990). The firmness was 1.8 N/8 mm and the total soluble solid was 19.82 oBrix.

Experimental setup

The overview of through flow type of tray dryer was illustrated in figure 1. The experimental system consists of a fan, heater and temperature control system and drying chamber. Air was forced through heater and tray in drying chamber by fan.

![Diagram of through flow tray dryer](image)

**Figure. 1.** The overview of through flow tray dryer consists of 1) data logger, 2) temperature and air velocity controller, 3) fan, 4) heater, 5) samples, 6) air inlet and 7) air outlet

Drying procedures

The samples were placed on the drying tray and dried in drying chamber. The drying condition was desired in steady state with air temperature and air velocity. They were 50, 60 and 70°C air temperature and 1.5 m/s air velocity. The drying process was finished when the final moisture content of the samples were reached to approximately 25.00% (dry basis). The sample
weight and air temperature were recorded every 2 minute by data logger (Lufft Opus 200). The air velocity passing through the tray was measured by a vane type anemometer (Lutron AM-4201).

The drying behavior of sample was illustrated by drying curve which was plotted with drying time versus the moisture ratio (MR). The experimental drying curves were fitted using the Lewis model (Eq.1) by minimizing sum of squared error (SSE).

\[
\text{MR} = \frac{(X - X_{eq})}{(X_0 - X_{eq})} = \exp(-k t)
\]  

Where MR is the moisture ratio, X is the moisture content at any time (kg water·kg dry matter\(^{-1}\)), \(X_0\) is the initial moisture content (kg water· kg dry matter\(^{-1}\)), \(X_{eq}\) is the equilibrium moisture content (kg water· kg dry matter\(^{-1}\)), \(k\) is the kinetic parameter (s\(^{-1}\)), \(t\) is the drying time (s).

Drying rate

The drying rates were calculated from MR changes in each consecutive time interval as presented in Eq. [2]

\[
R_D = - \frac{X_{t+\Delta t} - X_t}{\Delta t}
\]  

Where \(R_D\) is the drying rate (kg water· kg dry matter\(^{-1}\) s\(^{-1}\)), \(X_{t+\Delta t}\) is the moisture content at \(t+\Delta t\) (kg water· kg dry matter\(^{-1}\)), \(X_t\) is the moisture content at \(t\) (kg water· kg dry matter\(^{-1}\)) and \(\Delta t\) is the increment time (s).

Color assessment

During the drying process, the color of the sample was measured by using a Hunter Lab (Miniscan XE plus, Hunter Assoc. Lab, Inc., USA) in every 20 minutes interval. Twenty random areas of the sample surface were measured in duplicate and were reported in \(L^*\) (lightness), \(a^*\) (red/green) and \(b^*\) (yellow/blue). The \(\Delta E^*\) was calculated by using Eq. [3], [4], [5] and [6]:

\[
\Delta E^* = \sqrt{(\Delta L^*)^2 + (\Delta a^*)^2 + (\Delta b^*)^2}
\]  

\[
\Delta L^* = L^* - L_{0^*}^*
\]  

\[
\Delta a^* = a^* - a_{0^*}
\]  

\[
\Delta b^* = b^* - b_{0^*}
\]

Where \(L_{0^*}\) is initial value of \(L^*\), \(a_{0^*}\) is initial value of \(a^*\) and \(b_{0^*}\) is initial value of \(b^*\).

Rate of color changes

The rates of color changes were calculated from \(\Delta E^*\) changing which occurred in each consecutive time interval as presented in Eq. [2]

\[
R_{\Delta E^*} = - \frac{\Delta E^*_{t+\Delta t} - \Delta E^*_t}{\Delta t}
\]
Where $R_{DE*}$ is the rates of color change, $\Delta E^*_{t+\Delta t}$ is the total color differences at $t+\Delta t$, $E^*_t$ is the total color differences at $t$ and $\Delta t$ is the increment time.

**Statistical analysis**

All experiments were performed in triplicates. The experimental data was statistically analyzed by SPSS v.18. The results were expressed as the mean of triplicates for each treatment. One-way analysis of variance (one-way ANOVA) and Duncan’s multiple range test were used to analyze the mean differences at 95% significance level.

**4. Results and Discussion**

**Drying kinetic**

The drying curves of mangoes in three conditions of hot air drying were shown in Figure 2. In all conditions, the MR rapidly decreased at drying time in the first period and slowly in the second period until the process finished. The most rapidly drying process was 70°C and the latter processes were 60 and 50°C, respectively. From the result, it indicated that the drying temperature affected to the drying curve. Moreover, the drying temperature also significantly affected to the MR changes. The former researches were similarly reported in sour cherry (Wojdylo et al., 2014).

Figure 3 showed the drying rate of mangoes in three conditions. The result demonstrated that the high temperature accelerated the drying rate. The highest drying rate was obtained from the drying process at 70°C. Likewise, the lowest drying rate was obtained from the 50°C drying process. The drying rate was linearly related to MR. It indicated that the drying mechanism in this process was the falling rate. The resultant was identical with many previously researches (Lee and Kim, 2009; Yaldiz et al., 2001).

![Figure 2](image-url)  
Figure 2: The drying curve of mangoes in various drying temperature; (solid line) 50°C, (dashes line) 60°C and (long dashes line) 70°C.
Figure 3. The drying rate of mangoes in various drying temperature; (solid line) 50°C, (dashes line) 60°C and (long dashes line) 70°C.

Color kinetics

Figure 4, 5 and 6 presented the drying conditions in dried mangoes that affected on ΔL*, Δa* and Δb*, respectively. The changes of three color parameters showed a complicated mechanism in dried mangoes. Actually, the drying mechanism involved the color changes was complicated and related to moisture change and browning reaction in sample during the drying process. Zheng et al., (2006) studied the cooked beef and found that the moisture content was related to the color. In the same way, the multi-variated linear relation of color-moisture content was found by Mohebbi et al., (2009). All color parameters were quickly changed in the first stage. In contrast, they were gradually changed in the final stage same as reported by (Niamnuy et al., 2007). In addition, the color changes were activated by drying temperature. It was found that the more temperature cause the faster color changed. The color changes in drying at 70°C were speedily increased and were reached equilibrium in a short time while the drying at 50°C was moderately raised during the process. For the drying at 60°C, the color changes was quickly increased similar to the drying at 70°C, but it was less alterable than at the 70°C as a same reported in a dried apple by (Nadian et al., 2015). The color changes in the samples probably related to be brown color especially non-enzymatic reaction. Because of mangoes contained reducing sugar as sucrose, glucose and fructose which are the substrates of the Maillard reaction (Korbel et al., 2013).

The ΔL*, Δa* and Δb* was predicted by Eq. [8], [9] and [10] respectively.

\[
\Delta L^* = a(1 - \exp(-b \times t)) \quad [8]
\]

\[
\Delta a^* = a(1 - \exp(-b \times t)) \quad [9]
\]

\[
\Delta b^* = a(1 - \exp(-b \times t)) \quad [10]
\]

Where a and b were empirical parameters in Eq. [8], [9] and [10] respectively.
Figure 4. The experimental and predicted $\Delta L^*$ value as a function of drying time in various drying temperatures; ($\Delta$) 50°C, (○) 60°C and (□) 70°C.

Figure 5. The experimental and predicted $\Delta a^*$ value as a function of drying time in various drying temperatures; ($\Delta$) 50°C, (○) 60°C and (□) 70°C.

Figure 6. The experimental and predicted $\Delta b^*$ value as a function of drying time in various drying temperatures; ($\Delta$) 50°C, (○) 60°C and (□) 70°C.
Figure 7 showed the $\Delta E^*$ values of dried mangoes at different temperature. The $\Delta E^*$ values of finished products were 15.02, 11.07 and 8.06 for drying condition at 50, 70 and 60°C, respectively. In all drying conditions, the $\Delta E^*$ value were rapidly increased in the first period and gradually escalated in the final stage. Therefore, the color changes in the first period were affected by the higher drying temperature. It can be seen that the more temperature was high, the faster $\Delta E^*$ equilibrium reached as a same reported in a dried apple by (Nadian et al., 2015). Furthermore, color changes in the drying at 70 and 60°C nearly reached equilibrium at 20,000 seconds while color changes in the drying at 50°C were still continue to increase and gradually slowed down at the end of the process.

![Figure 7](image1)

Figure 7 The predicted $\Delta E^*$ value as a function of drying time in various drying temperatures; (△) 50°C, (○) 60°C and (□) 70°C.

![Figure 8](image2)

Figure 8 The rate of color changes as a function of drying time in various drying temperatures; (solid line) 50°C, (dashes line) 60°C and (long dashes line) 70°C.

The rate of the color changes ($\Delta E^*$) were shown in Figure 8. Because of the high drying temperature, the rate of the drying condition at 60 and 70°C initiated at moderate value and high value, respectively. The rates of both were nearly decreased to zero at 40,000 seconds afterwards. So, the color changes of the samples were dropped. The rate of the color changes at 50°C was
different from 60 and 70°C. They were started at low value and then dramatically increased until reached to the highest value of $6.21 \times 10^{-4}$ and they were slowly decreased afterwards. Comparing to the rate of the color changes at 60°C and 70°C, the rate of the color changes at 50°C were varied all the time. Since the time at 6,000 seconds, their rate was higher than at 60 and 70°C until the end of the process.

5. Conclusion

The effect of drying temperature on kinetic parameters and color quality in dried mangoes were investigated. The color changes was affected by the drying temperature and usually occurred in the first period of the process. In contrast, the drying temperature in the final period of the process did not affect to the color changes in dried mangoes. Impact factors on the color changes were the interval of the first period and the rate of the color changes. The drying process at 60°C was the optimal drying temperature for color preservation of dried mangoes.

6. References


Denotation and Connotation of the Lanna Dharma Alphabet

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Abstract

This research studies the meaning associated with the Lanna Dharma Alphabet from 1376 to the present. It chronologically follows five historical periods from the early Mangrai dynasty through the periods of Burmese rule, the Laochiang tributary state, unification with Bangkok under the absolute monarchy and the present. It implements Eugene A. Nida’s componential analysis approach and Ladislav Zgusta’s components of lexical meaning as key theoretical tools.

The research finds that the meaning associated with the Lanna Dharma Alphabet (LDA) follows five historical periods. First, in the early Mangrai dynasty, the LDA was revered as sacred and related to Buddhism. In the period of Burmese rule, its meaning was associated with Buddhism and secularism. During these two periods, LDA characters were written on palm leaves with a stylus and used for education in temples and palaces. In the third period, the Laochiang tributary state, its meaning was associated with Buddhism, secularism and with Christianity. Characters were still written on palm leaves using a stylus but printing blocks were also used; the texts were used for education in temples, palaces and schools. In the unification with Bangkok period, the LDA became an ancient script that was no longer produced and used for education. At present, the LDA is considered part of the Lanna cultural heritage and must be conserved.

The meaning of the LDA in each of the periods comprises two components: denotation and connotation. The denotation shared by the periods is ‘a set of characters comprising the alphabet’, whereas the connotations vary from one historical period to another.

The connotations of the LDA can also be categorized into two groups, the first signifying prosperity and the second decline. Connotations associated with prosperity are evident in the early Mangrai dynasty, the period of Burmese rule, the period of the Laochiang tributary state and the present time, while the connotation associated with decline is found in the period of unification with Bangkok under the absolute monarchy.

Keywords: meaning, denotation, connotation, semantic feature, Lanna Dharma Alphabet

1. Introduction

The Lanna Dharma Alphabet (LDA) is a set of characters found in texts in northern Thailand, the word “Lanna Dharma” being used by linguistic academics to describe it. Other names that have been used for the Lanna Dharma Alphabet are “Akson Tai Yuan” or the Tai
Yuan Alphabet, “Tua Thamma” or the Dharma Alphabet and “Tua Muang” or the Lanna Alphabet (Udom Rungruengsri, 2008:45).

Lanna is the name given to a historical kingdom bordering the old Thai kingdom of Sukhothai to the south, the Lao kingdom of Lan Chang (centered on Luang Prabang) to the east and the Tai kingdom of Chiang Rung (Jinghong) to the north. Some of the land in the former kingdom of Lanna now lies within the provinces of Chiang Mai, Chiang Rai, Lampang, Lamphun, Mae Hong Son, Nan, Phayao and Phrae in northern Thailand. (Saarrassawadee Ongsakul 2014:28-29)

The LDA was used in ancient Lanna society but evidence for its origins has yet to be found. Georges Coedes (Coedes, 1983:3, 9-10) suggested that it was developed from the ancient Mon script but did not provide evidence to support this.

The oldest use of the LDA is in the Lanthong Mahaterachutamanee inscription to write Pali in 1376, followed by the script used on the base of a Buddha image at Wat Chiang Man in Chiang Mai to write Tai Yuan (northern Thai dialect) and Pali in 1465 (Naiyana Prongtura, 1984:12).

The study of research relating to the LDA shows that changes in Lanna society influenced the meaning of the LDA; during the period when the LDA was used to write the Buddhist dharma, the LDA had a positive meaning associated with spirituality and respect, but when it ceased to be used in everyday life, its associations became negative, an ancient script that no longer had any value.

The connotative meaning of LDA as influenced by social conditions in Lanna reflects the views of academics who have studied the LDA using historical evidence from stone inscriptions, palm leaf inscriptions, annals and official documents used in communications between Lanna and Bangkok in the past.

This research is interested in the changes in the connotative meaning value of the LDA from 1376 to the present, which is divided into five periods: the Mangrai dynasty, the period of Burmese rule, the Laochiang tributary state period, the period of unification with Bangkok under the absolute monarchy and the present time. The study implements Eugenne A. Nida’s componential analysis and Ladislav Zgusta’s components of lexical meaning as key theoretical tools.

2. Theoretical Framework

This research used two theoretical frameworks. The first one is Eugene A. Nida’s componential analysis approach. The second one is Ladislav Zgusta’s components of lexical meaning.

\[ \text{Setting} \quad x' = x \text{ is a meaning} \]
\[ +A = \text{has A/is A} \]
\[ -A = \text{not having A/ is not or not A} \]
\[ [x] = x = \text{equals denotative semantic features} \]
\[ (y) = y = \text{equals connotative semantic features} \]
2.1 Componential Analysis

Eugene A. Nida’s componential analysis is an approach to analyze the meaning of words used in the same set in order to identify their semantic features. Semantic features are parts of a meaning of a word. For example, the semantic features of the word “cakkrayan” (bicycle) are composed of three semantic features: (1) ‘vehicle’, (2) ‘two wheels’, (3) ‘no motor’. The description of these three semantic features results from the componential analysis.

Componential analysis has two steps. The first step is to look at inclusive features of the meanings of the words in a set. The second step is to look at their exclusive features. For example, by using componential analysis to identify semantic features of the words “tuktuk” (motor tricycle) and “cakkrayan” (bicycle), both words are seen to have ‘vehicle’ as an inclusive feature. Their exclusive features are in two dimensions. The first dimension is the ‘number of wheels’; the tuktuk has three wheels but the cakkrayan has two. The second dimension is ‘motor usage’; the tuktuk has a motor but the cakkrayan has none. The result of the analysis can be shown as follows.

- **tuktuk**
  - +vehicle
  - +three wheels
  - +motor

- **cakkrayan**
  - +vehicle
  - +two wheels
  - -motor

The result of componential analysis can be used to state the definition of the words “tuktuk”, which is ‘a kind of vehicle which has three wheels and a motor’, and “cakkrayan”, which is ‘a kind of vehicle which has two wheels and has no motor.’

2.2 Components of Lexical Meaning.

Ladislav Zgusta’s idea about components of lexical meaning explains the parts of meaning of a lexical unit. A lexical unit is a form which has meaning and may be a word or an idiom composed of a word or a group of words. An example of an idiom is “muu nai ouaj” (pork in a pot = ‘thing that in someone’s control’).

In Zgusta’s view, lexical meaning is composed of three components. The first component is denotation. Denotation is the main part of the meaning of a word. It is composed of features such as set, subset and function. For example, the denotation of the word “crocodile” is ‘an animal: a large reptile with very big jaws, a hard skin and a long tail.’ The denotation of the word of the word “LDA” is ‘an alphabet set’.

The second component is connotation. Connotation is the additional meaning associated with a word. Connotation is a feature of the native speaker’s experience, feeling, and/or attitude about the thing that word denotates. Some words have no connotation. While denotation is obligatory, connotation is optional. For example, a connotation of the word crocodile is ‘dangerous’. This connotation brings additional meaning related to the native speaker’s experience. The connotation of the word “LDA” at the present time is ‘a valuable Lanna heritage’. This connotation adds meaning about the native speaker’s attitude.
The third component is range of application, which brings additional meaning to a word. The range of application is a feature of the specific context of a word. For example, the range of application of the word “moo” (doctor) is that it is an informal style, whereas the range of application of the word “phaet” (doctor) is formal.

In this research, I applied the idea of componential analysis and the idea of components of lexical meaning together. I use the idea of semantic feature, which is the result of Nida’s componential analysis approach and the idea of denotation and connotation, which are parts of Zqusta’s components of lexical meaning.

3. Meanings of the Lanna Dharma Alphabet

This research found five meanings of the LDA according to events in Lanna as follows.

3.1 Meaning of the Lanna Dharma Alphabet in the early Mangrai dynasty

During the early Mangrai dynasty, the Lanna kingdom prospered from the reign of Phaya Kuena to the reign of PhayaKaeo, during which time Buddhism in society is considered to have been advanced (Sarassawadee Ongsakul:149). The LDA records on stone inscriptions, metal and palm leaves are in Pali and relate to Buddhism. The oldest text using the LDA is the Lanthong Mahaterachutamanee text written in 1376. The oldest palm leaf manuscript is the Tingsanibat scripture from Laihin temple in KohKha, Lampang, written in 1471.

This study finds that the LDA (script) in the early Mangrai Dynasty period relates to both understanding and keeping faith in Buddhism. The conclusion to the LDA’s first meaning is ‘an alphabet set related to Buddhism, sacredness and veneration.’

3.2 Meaning of the Lanna Dharma Alphabet in the period of Burmese rule

At the end of the Mangrai dynasty, the Lanna Kingdom was so weakened by political and economic problems that the Burmese were able to colonize Lanna from 1558-1774. During this time, the policy of the Burmese kings was to follow local Lanna customs and continue supporting Buddhism since it accorded with their own Buddhist beliefs.

The LDA during this period was used to write records in Pali and Tai Yuan, the records describing both Buddhist and mundane matters. During this period, the LDA characters were used to express both religious and secular matters. They were written on palm leaves with a stylus and used for education in temples and palaces.

Thus, the second meaning of the LDA is ‘an alphabet set that related to Buddhism and secular matters. The LDA script was written on palm leaves with a stylus and was used for education in temples and royal courts.’

3.3. Meaning of the Lanna Dharma Alphabet in the Laochiang tributary state period

In the Laochiang tributary state period, the leaders of Lanna sought Siamese cooperation to defeat the Burmese, successfully expelling the Burmese from Chiang Mai in 1774. It took another 30 years before they were able to expel the Burmese from Chiang Saen in 1804. (Sarassawadee Ongsakul:309).
Subsequently, the Lanna kingdom became a set of self-administering muang (principalities) paying tribute to King Taksin of Thonburi and subsequent Siamese Kings until 1884 (Kringsak Chaidaroon, 2005:24 referenced in Apiwan Pansook, 2008:60).

The evidence shows that the LDA in this period was used to write both Pali and Tai Yuan texts relating to Buddhism, Christianity and secular affairs.

Thus the third connotation of the LDA is related to Buddhism, Christianity and secularism. Characters were still written on palm leaves using a stylus, but type and printing blocks were also used. The texts were used for education in temples, palaces and schools.

It can be concluded that the third meaning of the LDA is ‘an alphabet set that is related to Buddhism, Christianity and secularism. Characters were still written on palm leaves using a stylus but printing blocks were also used. The texts were used for education in temples, in royal courts and in schools.’

3.4. Meaning of the LDA in the period of unification with Bangkok under the absolute monarchy

After the period of the Laochiang tributary state (1884-1892) the northern muang became known as Monthon Laochiang (1893-1899) and then Monthon Phayap (1899-1933) (Kringsak Chaidaroon:24 referenced in Apiwan Pansook:60 and Sarassawadee Ongsakul:507). The formation of Monthon Phayap as part of the thesaphibal system occurred when Phraya Srisahatep was a special Siamese commissioner (Sarassawadee Ongsakul: 542). The Siamese reorganization of the administration and grouping of provinces into monthon, or circles, controlled by Siamese commissioners led to the end of the Lanna tributary state period. Lanna became a part of Siam as local rulers lost their status and power as heads of local administrations, ending the system of principalities that had local royal families. (Sarassawadee Ongsakul: 449)

In this period, the LDA was forced to lose its importance. Bangkok embarked on a process of educational reform and monks were not allowed to continue studying using the LDA. A new system of Thai schools with Thai books replaced traditional learning in the temples. Monks were required to study in the Central Thai alphabets instead of the LDA, and thus it can be said that use of the LDA was suppressed. In this fourth period, it can be concluded that the fourth meaning of the LDA is ‘an alphabet set that was no longer produced and no longer used for education.’

3.5 The present meaning of the Lanna Dharma Alphabet

In 1953-1958, Kraisri Nimmanhemin (1912-1992) started researching the LDA and local culture and wisdom. He discovered the ancient Lanna kiln site at Sangkhalok and an important palm leaf manuscript known as Mangrai’s law. He was a leader in restoring the customs of the khonmeuang (northern people), encouraging them to bring back into favor local cultural practices such as having meals in the khantoke style (people sit around wooden trays of food to be shared) and wearing mohom, a local blue cotton cloth dyed with indigo. He also studied northern palm leaf manuscripts found in temples for academic research and to help with their preservation.

Along with Sanguan Chotisookrat (1922-1957), who wrote a history book about Lanna culture, and Singkha Wannasai (1920-1980), who translated the LDA to Thai and wrote a textbook.
About the LDA, Kraisri Nimmanhaemin played an important role in encouraging the public to begin studying the LDA more seriously.

At present, universities in the northern region such as Chiang Mai University, Chiang Mai Rajabhat University, Maejo University and Payap University have been supporting the study of reading and writing and producing publications in LDA. On the religious side, monks have published the Tripitaka and the Atthakatha using the LDA to write Pali.

The LDA has gained wide attention among academics, monks and people interested in history and literature. It can be concluded that the fifth meaning of the LDA is ‘an alphabet set that is both handwritten and printed that is considered part of the Lanna cultural heritage that must be conserved.’

As has been shown, therefore, the meaning value associated with the LDA has changed according to historical period.

4. Components of the Lanna Dharma Alphabet

The LDA has two components: denotation and connotation. These can be described as follows.

4.1. Denotation of the Lanna Dharma Alphabet

The denotation of LDA has remained unchanged throughout the five periods of the LDA.

4.2. Connotation of the Lanna Dharma Alphabet

The connotation of LDA is determined by the way it was used, the attitude towards it and its popularity. These have been shown to vary according to period. This can be expressed in the following diagram showing time period, denotation and connotation.

\[
\text{Setting } +A = \text{has A/is A} \\
-A = \text{not having A/is not or not A} \\
[x] = x \text{ is the denotation} \\
(y) = y \text{ is the connotation}
\]

For example, the status of the LDA in the Mangrai Dynasty can be represented as follows:

```
LDA in the early Mangrai dynasty
[  + alphabet set ]
  + related to Buddhism
  + sacred
  + worship
  + written on palm leaves with a stylus
  + educational use in temples and palaces
```

This diagram explains that the LDA in the early Mangrai Dynasty has a denotation and connotation. The denotation is the alphabet used and the connotation relates to Buddhism, sacredness, worship, production by stylus on the palm leaves and use for education in temples and in royal courts.
The conclusion is that the meaning of the LDA in each of the periods comprises two components: denotation and connotation. The denotation shared the same meaning in all periods, whereas the connotations vary from one historical period to another.

5. Grouping the meanings of the LDA

The five meaning values associated with the LDA can be categorized into two groups: the first is when it is positive due to its use and perceived value to society and the second is when it is in decline, is in decreasing use and has negative value.

5.1 Positive meanings of the LDA

The meaning of LDA in the early Mangrai dynasty indicates is positive. The Lanna people accorded value to the LDA because it was a sacred alphabet used for recording Buddhist texts.

The meaning of the LDA in the period of Burmese rule is positive. The Lanna people valued the LDA because it was used to record Buddhist texts and secular matters.

The meaning of the LDA in the Laochiang tributary state period is positive. It continued to be used in Buddhist and secular affairs but was also used in Christianity.

The present value of LDA is positive because groups of people in Lanna consider the LDA as part of the Lanna cultural heritage.

The four positive meaning values of the LDA in the four periods described (3.1, 3.2, 3.3 & 3.5) can be divided into 2 groups according to whether the LDA was in common use. Thus it was in common use in the first three periods but then ceased to be in common use.

The LDA can be seen as having a positive value in the early Mangrai dynasty, the period of Burmese rule and the Laochiang tributary state period since it was in common use and was considered sacred in the context of its use in recording Buddhist texts in Lanna (see 3.1). Its common or popular use then extended to secular matters in the period of Burmese rule (3.2) as well to Christianity in the Laochiang tributary state period (3.3).

At the present time (3.5), the positive value of the LDA is historical, being derived from its perceived value as part of the Lanna cultural heritage and is distinct from the positive value derived from its common social use in the first three periods.

5.2 Declining meaning of the LDA

The use of the LDA went into decline as a result of the imposition of rule from Bangkok and common use of the LDA script disappeared when monks and the laity could no longer study it.

6. Conclusion

The above explanation leads to the conclusion that there are five meaning value associations for the LDA. Each value has two components: denotation and connotation. While denotation remained constant for each period, the connotative value association changed according to period, with four periods being positive and one being negative. The first group indicated the LDAs popularity during the periods of the Mangrai Dynasty, Burmese rule, the
Laochiang tributary state and the present time. The second group of meaning indicated the depreciation in the period of unification with Bangkok under the absolute monarchy.

7. Benefit and Suggestion for Further Study

The benefit of this research is the contribution of Lanna study because it motivates Lanna people to realized that LDA is valuable Lanna heritage and it is one of Lanna identity.

The meaning of the LDA in this research is the meaning of LDA from 1376.to the present only in the aspect of some academics. Researcher who is interested in the meaning of LDA can use the framework in this research as a tool to study the meaning of LDA in the aspect of persons in various fields, such as astrology, pharmacy and art. Some researchers may study the meaning of LDA in ethnic groups outside Thailand, such as Lanna community in Myawaddy in Karen State in Myanmar.

8. References


Frameworks for Stylistic Analysis

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Abstract

The research titled “Frameworks for Stylistic Analysis” proposes frameworks for stylistic analysis and their application. The author applied Davis Crystal and Derek Davy’s approach to stylistic analysis of varieties of languages and Geoffrey N. Leech and Michael H. Short’s approach to stylistic analysis of fictional prose to the research.

There are three frameworks for stylistic analysis discussed here: the primary framework is discourse stylistics, the secondary framework is pragmatics and stylistics and the supplementary framework is mind and stylistics and/or society and stylistics. As the primary framework, discourse stylistics focuses on analyzing components of discourse and points out distinctive features of the text at the level of discourse. Pragmatics and stylistics, the secondary framework, analyze factors in a communicative situation that discern distinctive features of the text. The supplementary framework using the approaches of mind and stylistics and society and stylistics provides analytical tools for psychological and/or social factors that mark the text’s distinctive features. The supplementary framework also explains the converse influence of the text’s distinctive features on the mind and/or society.

Applying the above-mentioned frameworks to an analysis of each group of data, the author took into account the components of discourse (e.g. sentence structure, word types) and the pragmatic components (e.g. speech act, pragmatic presupposition) in order to explain distinctive features of the data. Moreover, psychological factors (e.g. mindfulness, motivation) and social factors (e.g. episteme, social norm) complement the discussion of distinctive features of the data. The stylistic analysis comprises three steps: analyzing each group of data, then, concluding the analysis of all of them as a whole and, lastly, employing the analysis in the discussion of the stylistics.

The frameworks for stylistic analysis proposed here integrate linguistic knowledge with the knowledge of what constitutes the use of language in a certain context such as pragmatics and the mind and/or society.

Keywords: style, stylistic analysis, discourse, pragmatics

1. Introduction

Language stylistics refers to the distinctive features of a language (Wales, 1989:435-436); for example, the stylistics of a newspaper’s headline refers to distinctive language styles therein
that are different from others. For example, a Thai newspaper headline may use a special word like “suptar” as an abbreviation taken from the English “superstar” and precede it with a quantity as in “3 suptar”, whereas normal Thai word order and usage would place the numeral as well as a classifier after the noun as in “superstar sam khon” (lit: superstar three persons).

The analysis of style looks at the distinctive features in text at the discourse level, whether the discourse is a monologue or dialogue.

Current research (Teera Roongteera, 2012:217-226) on the general aspects of stylistics analysis finds that at present some language analysis research uses only a language framework while others add a pragmatics framework. However, no research appears to use frameworks for language, pragmatics and frameworks that incorporate the psychological and social settings as well. This study uses all aforementioned frameworks and demonstrates their application.

**Approach used by this research**

The author applied David Crystal and Derek Davy’s approach to stylistic analysis of varieties of languages and Geoffrey N. Leech and Michael H. Short’s approach to stylistic analysis of fictional prose to the research.

Both approaches use the same methods to analyze language style by 1) analyzing context, sounds, words, sentences, figures of speech and techniques and 2) considering their frequency of occurrence in the text.

The linguistic units that occur more frequently than others are significant as they are the way to identify the distinctive linguistic features of the text.

**2. Proposed Frameworks for Stylistic Analysis**

Stylistic analysis uses the primary framework, the secondary framework and the supplementary frameworks as follows.

1. **Primary framework**

The primary framework is discourse stylistics, which looks at language in text and provides a way to analyze its components in terms of turn (when used in dialogue), speech act, gist and linguistic features.

**Turn** refers to the utterances made by speakers in a conversation. There must be at least two turns in a dialogue, such as in a question and response. The sender asking the question offers a turn; the receiver takes the turn by providing the response to the questioner.

**Speech Act** is an action performed by means of utterance that refers to the speaker’s intention, such as telling (giving information), ordering or asking (Royal Institute, 2010:424-425).

**Gist** identifies the main meaning according to the situation and feelings of the participants (“Ideational Structure” in Schiffrin, 1990:25-26, “Feeling and Tone” in Richards, 1929:173-181).

**Linguistic features** refers to the language used to show the speech act and gist.
After the discourse components have been analyzed, the frequency of linguistic units’ occurrence is studied to identify the distinctive features of the text. The summary of these distinctive features identifies the style of the text.

2. Secondary Framework.

The secondary framework is pragmatics and stylistics. It looks at the sending and receiving of text in terms of speech act, pragmatic presupposition, conversational implicature and the cooperative principle.

**Speech acts** are divided into direct speech acts and indirect speech acts. Direct speech acts are when the sender uses language to transmit his direct meaning to the receiver. In indirect speech acts, the text sent does not carry the direct meaning to the receiver, who has to interpret the sender’s intention (Searle, 1975:59-82).

**Pragmatic presupposition** refers to the experience, knowledge and beliefs that help the receiver interpret the meaning from the context and words of an utterance. Thus the pragmatic presupposition provides the basis for understanding meaning from context and utterance (Caffi, 2009:764-766 and Krisadawan Hongladarom and Teeranoot Chauksuvanit, 2008:42-44).

**Conversational implicature** is the meaning that the sender wants to give to the receiver without saying so directly through the words used. The receiver can interpret the intended meaning by considering both the words used and the context (Grice:41-58, Cliffrin, 2002:193, Krisadawan Hongladarom and Teeranoot Chauksuvanit:71)

**The cooperative principle (CP)** is fundamental to normal conversation. It is a kind of tacit agreement to work together to achieve a coherent and effective exchange in order to help the interaction to be smooth, useful and successful for both sides. The CP is assumed to be the norm by speakers in a conversation (Grice: 45-47). While CP is the general norm followed in conversation, in some conversations speakers may break the principle either intentionally or unintentionally. Intentionally breaking the CP is meant to generate a conversational implicature. Such intentional infringement of CP is called flouting a maxim.

The results of the analysis of speech act, pragmatic presupposition, conversational implicature and the CP combined with the analysis of an utterance’s components generate the explanation of utterance related to context.

3. The Supplementary Framework

The supplementary frameworks (SF) are mind and stylistics and/or society and stylistics, as explained below.

The first SF relates to mind and language style. It refers to the state of mind of a sender and may refer to Buddhist concepts, such as mindfulness and sublime states of mind, or psychological concepts such as personality and motivation. This framework looks at both the influence of the mind on language style and language style on the mind.

The influence of the mind on language can be seen in the example of a sender with a confused state mind who generates convoluted text. When language style influences the mind,
it generates new feelings and thoughts or changes preexisting ones in the receiver’s mind, such as in the language used by a counselor trying to persuade or warn a client.

The second SF concerns the relationship of society to language style through Foucauldian discourse, signs and myths, ethnography of communication and linguistic determinism as follows.

**Foucauldian Discourse Analysis** refers to analyzing the meaning making process of any object (people, animals, objects, events, words in language etc.) so that people in one society have a meaning that is accurate and appropriate. Discourse is created from social episteme, discursive practice and its manifestation, whether as utterance or action. The episteme is made up of opinion and norm defining utterances or action as good/not good, right/wrong, appropriate/inappropriate. Discursive practice is the action through which the episteme is presented. (Foucault, 2010:117, Fairclough, 2010:230 and Wasinee Sutiwipakorn, 2009:16)

**Sign** is composed of the signifier and the signified. The signifier is the sound that the sender thinks when uttering it and the sound the receiver perceives receiving it. The signified is the concept the sender has in mind and the receiver interprets (de Saussure, 1966:66-67).

**Myth** is meaning related to the experience and attitude created by the sender. For example, in myth a woman can be described as having beauty that brightens the world, but in reality she is a member of the female sex. (Roland Barthes, 1972).

**The ethnography of communication** is a society’s customary language use in communications. Both verbal and non-verbal language use are part of social activity and thus language use is related to social culture, norms and traditions in each communicative act (adapted from Saville-Troike, 2003:23-26, 110-125 and the Royal Institute:155-156). In each communication, the communicators will follow the rules for interaction and the norms of interpretation together. The rules for interaction are the basis for each communicative event. A native speaker will closely follow these rules, which form a body of knowledge that is part of communicative competence. The rules of interaction help the native speaker communicate in a manner appropriate to the situation according to social norms. The norms of interpretation are social norms, beliefs and customs which are interpreted from the communicative acts.


As regards the methodology for studying the influence of society on language style, discourse analysis, sign and myth and ethnography of communication can be applied. As regards the effect of language style on society, the Sapir-Whorf hypothesis can be used.

In summary, the first framework for studying language style looks at the language in the text. The secondary framework looks at pragmatics and language style and the supplementary framework studies the relationship between mind and language style and society and language style.
How to apply the framework of language stylistic analysis

The analysis of language style must apply the primary framework: discourse stylistics, the secondary framework: pragmatics and stylistics and supplementary frameworks: mind and stylistics and/or society and stylistics.

The analysis of the study of language style is shown in the following diagram.

![Diagram explaining how to apply the framework of language stylistic analysis.](image-url)

**Figure 1 Diagram explaining how to apply the framework of language stylistic analysis.**

**Specification** = application of language style analysis in text.

Specifying the author’s conceptual framework on the methodology to be used in language style analysis.

This diagram shows how the stylistics researcher must use the primary framework: discourse stylistics, the secondary framework: pragmatics and stylistics and a supplementary frameworks: mind and stylistics and/or society and stylistics.

Following the above framework to analyze text, the stylistics researcher must consider the elements of the text (such as the utterance structure, type of words used) and the pragmatics (such as speech act and pragmatic presupposition) to describe the basic distinctive features of the language in the text. In addition, the researcher must also consider the state of mind (such as level of awareness and motivation) and society (such as episteme and social norm) to describe the distinctive features of the text.

To complete the analysis, the results from previous analyses must be brought together to explain the style.

An example of how this approach analyses a text is given in an example of a person discussing a life crisis on a radio program called "Club Friday".

The study is of a text delivered by a person giving advice regarding a personal problem on the Club Friday radio program. It shows discourse that combines turn, speech act, message content, rules for interaction and basic principles of the state of mind and social norms regarding giving a consultation.

Taking the three frameworks for studying language already described, the text featuring a consultation on a radio show is as follows.

In the text, consultant Khun Napaporn Traiwitwareekul (Phi Ooy) is giving advice to caller, Khun Pat (Nong Pat). Pat’s problem is that she had agreed to live with a man but she did not
know he was already married. When she discovers he has a wife, she confronts him, whereupon he lies to her, telling her that the relationship with his wife was not serious and he continues asking Pat to help him with his work. Pat says that he treats her so well that she is unable to leave him. Called “Phi Ooy” in the discourse, the radio consultant says the following.

Phi Ooy  “Nong Pat, can I ask you one thing. What is your status?”

Khun Pat  “You mean right now?”

Phi Ooy  “Yes.”

Khun Pat  “I can only be a substitute, what I really feel now is that I must try to get out try not to have anything to do with him.”

When Phi Ooy asks Pat about her status, she is asking her to confirm her situation even though Phi Ooy already knows what it is. This utterance is a speech act to show Pat’s inferiority, to get her to bring greater urgency to solving the situation, to which Pat agrees when she says she must try to get out of his life (the inferior status of Pat is also indicated by Phi Ooy’s use of “nong” meaning younger and lower status person, inferring that Ooy is the “phi” or higher status person).

The methodology that Phi Ooy uses can be explained through Abraham Maslow’s theory of motivation. Maslow said one of the human motivations is the desire to have prestige and dignity. When Phi Ooy asks a question that forces Pat to admit her low self-esteem and lack of status as the second woman in a man’s life, the question has the power to stimulate Pat’s desire to escape her predicament.

In addition, by asking Pat to address her status as a minor wife she is reminding Pat that by living with another woman’s husband she is breaking a social norm in a monogamous society like Thailand.

The author has applied the three frameworks. The first framework is shown when the question is asked. The second framework is shown in the speech act to show inferiority. The pragmatic presuppositions are the knowledge and understanding of Pat’s problem and social norms they both are aware of. The third framework is shown in the mental factors affecting language, such as motivation, and in social factors such as the norms in male female relationships.

Having concluded each level of analysis, the final step is to apply the result to describe the language stylistics of the radio consultation program “Club Friday” as follows.

Increase awareness of the problem. The second feature uses words that help show how to escape the problem and stimulate the desire to do so. The third tries to help the person behave in a way that reduces suffering in the present and future and the fourth uses utterances to give general encouragement to the person.

In conclusion, the framework used to analyze language discourse stylistics is the framework of discourse stylistics, pragmatics and stylistics, mind and stylistics and/or society and stylistics. Each step in the analysis has to be completed for the entire body of information under study. This information must then be summarized before it is used to explain the discourse stylistics.
The conclusion of this paper on “Frameworks for Stylistic Analysis” demonstrates that language analysis should take knowledge related to language into consideration. Language cannot exist in isolation without the context of people as senders and receivers. Aside from the immediate context of communication, social and cultural contexts will always be relevant to language style as well.

3. Benefit and Suggested Further Study

The value of this research is that it provides evidence to show that by integrating language analysis with pragmatic, psychological and sociological analysis, the researcher can explain the style of the text from a broader perspective.

The proposed frameworks can be a tool for analyzing styles of any kind of discourse, whether dialogues in everyday life or monologues in social media.

In future, researchers may apply the proposed frameworks to study discourse grammar or components of literature such as a short story or novel.

4. References


The Factors contributing to Students’ Dropout of Faculty of Management Science Nakhon Sawan Rajabhat University

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Abstract
The purpose of this research was to examine the factors which contribute to students’ dropout from Faculty of Management Science, Nakhon Sawan Rajabhat University and confirmatory test of the measurement model that is conducted using Confirmatory Factor Analysis. The factors that were examined included: 1) student family status 2) personal reasons 3) university support 4) attitudes toward the learning, and 5) the reasons for dropping out. The samples were 147 dropout students of seven programs in Faculty of Management Science, Nakhon Sawan Rajabhat University. Data were collected from dropout students using a questionnaire as the research tool. The techniques of statistical analysis used by the researcher in analyzing the data collected were Confirmatory Factor Analysis (CFA).

The result found that the majority of student dropouts were students in the Accounting program followed by students in the Hotel and Tourism Management program. The Business Economics program experienced the fewest student dropouts. Furthermore, the factors that contribute to the students’ dropout composed of student family status, personal reasons, university support, the attitudes toward the learning and the reasons for dropping out that used to examine the purpose of confirmatory factor analysis or measurement model were shown to be appropriate in items of construct validity and reliability at an acceptable level.

Keywords: dropout, confirmatory factor analysis, acceptable level, constructs

1. Introduction
In a developing country it is important to provide education. From this viewpoint, the education policy in Thailand provides the opportunity for all people to have equal rights to be educated. They are accepted without having to undertake an entrance examination. As a result, some students cannot complete their course and graduate, which leads to a waste of educational resources. Furthermore, the concept of education is changing to become a business. For many institutions, and especially for tertiary education institutions, there is more competition for the business.

At the same time the increasing dropout rate has created a serious problem for the education system and for society because the student who drops out before completing their course results in a loss of valuable resources of the nation. This has an impact on both the
country’s economy and family economies. Furthermore, a student who drops out into a failing economy may experience a curtailment of employment opportunities. (Lockett, Cornelious, & Gray, none)

However, the problem of student dropout has continued to increase and lead to wastage in education budget which is a major problem for the education system. In order to examine the situation better, the researcher has grouped all the factors into five categories, which are:

1. Student family status
2. Personal reasons
3. University support
4. Attitudes towards learning, and
5. Reasons for the dropout

The purpose of this research was to examine the factors that contribute to students’ dropout and was designed to answer the following research question: What factors influenced the students’ dropout in Faculty of Management Science, Nakhon Sawan Rajabhat University. An additional interest from the research was to study the economic and social impact of students dropping out.

2. Methodology

This research used the quantitative approach, with a questionnaire being the research tool used to conduct this study. The questionnaire was developed by the researcher to examine the factors that contribute to students dropout, and consisted of two parts; the first part of the questionnaire was designed to collect demographic data, and the second part was designed to collect data on dropout factors. The dropout factors used were compose of student family status, personal reasons, university support, the attitudes toward the learning and the reasons for dropout.

The population of all the students admitted to the seven programs of the Faculty of Management Science, Nakhon Sawan Rajabhat University from academic year 2012 to 2014 and who dropped out before completing their course, amounted to 712 persons. (The Office Academic Promotion and Registration, 2015). The samples in this study were selected from the population in the following seven programs: 1) Accounting program 2) Marketing program 3) Human Resources Management program 4) Business Computer program 5) Mass communication program. 6) Hotel and Tourism Management program and 7) Business Economics program.

Purposive and simple random sampling was employed to obtain samples from the list of student dropouts. Sample size was 10 cases per indicator, and for this research, there were 15 indicators. Therefore, the sample size was determined to be 150 cases (10x15=150).

This research utilized mailed questionnaires as the method to collect the quantitative data. The quantitative data were collected from 147 students who had dropped out before completing their course. After that, the data were entered into a spreadsheet for later analysis.
This study used descriptive demographic data such as percentage and frequency. Confirmatory Factor Analysis (CFA) was the research design for assessing the measurement model of latent constructs and to confirm the ability and assess the validity and reliability of latent constructs.

3. Results

Analysis of the demographics of respondents found that the vast majority of dropout students were female at 71.10 percent. Most of the dropouts were in accounting program (21.80 percent), closely followed by students who were in Hotel and Tourism Management program (21.10 percent) and the least were in Business Economics program (1.40 percent). Failing grades is the most common reason for dropout at 53.10 percent, followed by financial factors and unable to enroll at 34.70 percent. The result found that the demographic data of respondents were consistent with data from the Office Academic Promotion and Registration, Nakhon Sawan Rajabhat University, which showed that most of the student dropouts in the Faculty of Management Science were students of the Accounting program, and the most common reason for dropout was Grade Point Average (GPA) not qualified.

The results of Confirmatory Factor Analysis (CFA) to confirm the ability of the indicators used to measure the reliability and validity of constructs found that:

1. The student family status factors has 8 indicators, divided into 3 dimensions; family financial status, family status, and relationship with family. Validating the measurement model of latent constructs are shown in Figure 1.

![Figure 1](image.png)

Figure 1 The Factor Loading for all items of the student family status

Figure 1: Presents the factor loading all of latent constructs of student family status is significantly different from zero at level 0.05, $R^2$ ranged 0.29 to 0.44. The indicators used to measure the constructs with the highest precision in measurement is the ‘parental do not support them’ (FAMI 2), $R^2 = 0.44$and the least amount is ‘parental don’t give advice to them’ (FAMI 5), $R^2 = 0.29$. However, the model with set hypotheses and empirical data were shown to be goodness
of fit at an acceptable low level, Chi-Square insignificantly, \(p\)-value = 0.86, \(\chi^2/df = 0.64\), with statistically significant at \(p = 0.05\). (Table1)

Table1 CFA Analysis result of student family status

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Factors Loading</th>
<th>Coefficient (R²)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Family financial status:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FAMI 1 (Low income family)</td>
<td>0.56</td>
<td>0.32</td>
</tr>
<tr>
<td>FAMI 2 (Parental don’t support them)</td>
<td>0.66</td>
<td>0.44</td>
</tr>
<tr>
<td><strong>Family status:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FAMI 3 (Family got divorced)</td>
<td>0.59</td>
<td>0.35</td>
</tr>
<tr>
<td>FAMI 4 (They don’t live with parents)</td>
<td>0.55</td>
<td>0.30</td>
</tr>
<tr>
<td>FAMI 5 (Parental don’t give advice to them)</td>
<td>0.54</td>
<td>0.29</td>
</tr>
<tr>
<td><strong>Relationship with family:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FAMI 6 (Lack warmth and affection)</td>
<td>0.55</td>
<td>0.30</td>
</tr>
<tr>
<td>FAMI 7 (Parental ignore in their study)</td>
<td>0.59</td>
<td>0.35</td>
</tr>
<tr>
<td>FAMI 8 (Parental forced them to learn)</td>
<td>0.62</td>
<td>0.38</td>
</tr>
</tbody>
</table>

\(\text{Chi-Square} = 10.91, \text{GFI} = 0.98, \text{CFI} = 1.00, \text{AGFI} = 0.96, \text{NFI} = 0.98\) and \(\text{RMSEA} = 0.00\)

*Factor loading is significant at the level 0.05

2. The personal reasons factors has 7 indicators, divided into 3 dimensions; adaptation to the environment, relationship behavior with friend, and learning behavior, to confirm the ability of the indicators used to measure, the reliability and validity of the constructs. Validating the measurement model of latent constructs are shown in figure 2.
was found that the factor loading all of latent constructs of personal reasons is significantly different from zero at level 0.05, $R^2$ ranged 0.39 to 0.77. The indicators used to measure the constructs with the highest precision in measurement is ‘frequent absence from university (STUD6), $R^2 = 0.77$’ and the least amount is ‘negative relationships with peers’ (STUD), $R^2 = 0.39$. The model with set hypotheses and empirical data were shown to be goodness of fit at an acceptably good level, Chi-Square insignificantly, p-value = 0.113, $\chi^2/df = 1.62$, with statistically significant at $p = 0.05$. (Table2)

Table2 CFA Analysis result of personal reasons

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Factors Loading</th>
<th>Coefficient $(R^2)$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Loading</td>
<td>$SE$</td>
</tr>
<tr>
<td>Adaption to the environment:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STUD 1 (Negative relationships with peers)</td>
<td>0.62</td>
<td>0.086</td>
</tr>
<tr>
<td>STUD 2 (Dissatisfaction with the learning environment)</td>
<td>0.71</td>
<td>0.082</td>
</tr>
<tr>
<td>Relationship behavior with friend:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STUD 3 (Lack confidence in themselves)</td>
<td>0.76</td>
<td>0.081</td>
</tr>
<tr>
<td>STUD 4 (Relation with bad behavior friend)</td>
<td>0.71</td>
<td>0.082</td>
</tr>
<tr>
<td>Learning behavior:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STUD 5 (Have problems &amp; less attention in learning)</td>
<td>0.65</td>
<td>0.084</td>
</tr>
<tr>
<td>STUD 6 (Frequent absence from university)</td>
<td>0.88</td>
<td>0.074</td>
</tr>
<tr>
<td>STUD 7 (Don't understand the lesson)</td>
<td>0.75</td>
<td>0.077</td>
</tr>
</tbody>
</table>

Chi-square = 12.95, GFI = 0.98, CFI = 0.99, AGFI = 0.91, NFI 0.98 and RMSEA = 0.06

*Factor loading is significant at the level 0.05

3. The university support factors has 8 indicators, divided into 3 dimensions; university service system, curriculum and academic activity, and instructor performance, to confirm the ability of the indicators used to measure, the reliability and validity of the constructs. Validating the measurement model of latent constructs are shown in Figure3

![Figure 3 The Factor Loading for all items of university support](image-url)
Figure 3: Shows the measurement model analysis and the factor loading all of latent constructs of university support. Attempting to confirm the ability and assess the validity and reliability of a latent constructs found that, the fitness indices do not achieve the required level, Chi-square =27.66 significantly, p-value = 0.05. The LISREL Program Modification Indices (MI) suggested to modify the model due to the poor fitness index. After the model modification, it was found that the factor loading all of latent constructs of university support is significantly different from zero at level 0.05, \( R^2 \) ranged 0.48 to 0.66. The indicators used to measure the constructs with the highest precision in measurement is ‘inadequate academic activity’ (UNI 5) \( R^2 = 0.66 \) and the least amount is ‘instructors seem did not responsibility’ (UNI 8) \( R^2 = 0.48 \). The model with set hypotheses and empirical data were shown to be goodness of fit at an acceptable good level, Chi-Square insignificantly, p-value = 0.50, \( \chi^2/df = 0.96 \), with statistically significant at \( p = 0.05 \). (Table3)

Table 3 CFA Analysis result of university support

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Factors Loading</th>
<th>Coefficient (( R^2 ))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Loading</td>
<td>SE</td>
</tr>
<tr>
<td><strong>University service system:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNI 1 (Students care system inefficiency)</td>
<td>0.71</td>
<td>0.08</td>
</tr>
<tr>
<td>UNI 2 (Support service system inefficiency)</td>
<td>0.71</td>
<td>0.08</td>
</tr>
<tr>
<td><strong>Curriculum and academic activity:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNI 3 (Course provided cannot meet labor market)</td>
<td>0.70</td>
<td>0.076</td>
</tr>
<tr>
<td>UNI 4 (Learning activity not attractive)</td>
<td>0.78</td>
<td>0.073</td>
</tr>
<tr>
<td>UNI 5 (Inadequate academic activity)</td>
<td>0.81</td>
<td>0.072</td>
</tr>
<tr>
<td><strong>Instructor performance:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNI 6 (Inability of the instructor)</td>
<td>0.72</td>
<td>0.077</td>
</tr>
<tr>
<td>UNI 7 (Inappropriate teaching methods)</td>
<td>0.75</td>
<td>0.077</td>
</tr>
<tr>
<td>UNI 8 (Instructors seem did not responsibility)</td>
<td>0.69</td>
<td>0.78</td>
</tr>
</tbody>
</table>

Chi-square = 15.37, GFI =0.97,CFI=1.00, AGFI = 0.94, NFI 0.99 and RMSEA = 0.00

*Factor loading is significant at the level 0.05

4. The attitudes toward the learning factors has7 indicators, divided into 3 dimensions; classroom environment, subject area, and educational process, to confirm the ability of the indicators used to measure, the reliability and validity of the constructs. Validating the measurement model of latent constructs are shown in figure4.
Figure 4: The Factor Loading for all items of the attitudes toward the learning factors

Figure 4: Presents the factor loading all of latent constructs of the attitudes toward the learning is significantly different from zero at level 0.05. $R^2$ ranged 0.17 to 0.60. The indicators used to measure the constructs with the highest precision in measurement is the ‘non beneficial courses (ATTI 4), $R^2 = 0.60$ and the least amount is ‘course provided cannot meet their need (ATTI 1), $R^2 = 0.17$. However, the model with set hypotheses and empirical data were shown to be goodness of fit at an acceptable moderate level, Chi-Square insignificantly, p-value = 0.29, $\chi^2$/df = 1.19, with statistically significant at $p = 0.05$ (Table 4).

Table 4 CFA Analysis result of attitudes toward the learning

<table>
<thead>
<tr>
<th>Classroom environment:</th>
<th>Factors Loading</th>
<th>Coefficient ($R^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATTI 1 (Course provided cannot meet their need)</td>
<td>0.42</td>
<td>0.095</td>
</tr>
<tr>
<td>ATTI 2 (Bad attitude to their study program)</td>
<td>0.63</td>
<td>0.11</td>
</tr>
<tr>
<td>Subject area:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATTI 3 (Courses too difficult)</td>
<td>0.59</td>
<td>0.09</td>
</tr>
<tr>
<td>ATTI 4 (Non beneficial Courses)</td>
<td>0.78</td>
<td>0.095</td>
</tr>
<tr>
<td>Educational process:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATTI 5 (Dislike the teaching method)</td>
<td>0.59</td>
<td>0.088</td>
</tr>
<tr>
<td>ATTI 6 (Felt the classes were boring)</td>
<td>0.56</td>
<td>0.089</td>
</tr>
<tr>
<td>ATTI 7 (Assessment is not accurate)</td>
<td>0.63</td>
<td>0.088</td>
</tr>
</tbody>
</table>

Chi-Square = 13.13, GFI = 0.97, CFI = 0.99, AGFI = 0.94, NFI 0.96 and RMSEA = 0.04

*Factor loading is significant at the level 0.05

5. The reasons for dropout factors has 7 indicators, divided into 3 dimensions; financial factors, academics factors, and resign from a university, to confirm the ability of the indicators used to measure, the reliability and validity of the constructs. Validating the measurement model of latent constructs are shown in Figure 5.
Figure 5: The Factor Loading for all items of the reasons for dropout

Figure 5: Presents the factor loading all of latent constructs of the reasons for dropout is significantly different from zero at level 0.05, $R^2$ ranged 0.21 to 0.33. The indicators used to measure the constructs with the highest precision in measurement is program do not meet their needs (DROP 3), $R^2 = 0.33$ and the least amount is failing grades (DROP 4), $R^2 = 0.21$. However, the model with set hypotheses and empirical data were shown to be goodness of fit at an acceptable low level, Chi-Square insignificantly, $p$-value =0.16, $\chi^2$/df = 1.42, with statistically significant at $p = 0.05$. (Table 5)

Table 5 CFA Analysis result of the reasons for dropout constructs

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Factors Loading</th>
<th>Coefficient $(R^2)$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Loading</td>
<td>SE</td>
</tr>
<tr>
<td>Financial factors:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DROP 1 {Nobody support the money}</td>
<td>0.52</td>
<td>0.11</td>
</tr>
<tr>
<td>DROP 2 {Seek employment to make money}</td>
<td>0.50</td>
<td>0.11</td>
</tr>
<tr>
<td>Academics factor:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DROP 3 {Program do not meet their needs}</td>
<td>0.58</td>
<td>0.11</td>
</tr>
<tr>
<td>DROP 4 {Failing grades}</td>
<td>0.46</td>
<td>0.10</td>
</tr>
<tr>
<td>Resign from a university:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DROP 5 {Dislike the university environment}</td>
<td>0.55</td>
<td>0.095</td>
</tr>
<tr>
<td>DROP 6 {Unsure to get a Job after graduate}</td>
<td>0.57</td>
<td>0.095</td>
</tr>
<tr>
<td>DROP 7 {less relationship between student &amp; instructor}</td>
<td>0.55</td>
<td>0.095</td>
</tr>
</tbody>
</table>

$\chi^2$= 15.62, GFI =0.97, CFI=0.97, AGFI = 0.92, NFI 0.93 and RMSEA = 0.05

*Factor loading is significant at the level 0.05
4. Conclusions

This study examined the factors contributing to student dropouts from Faculty of Management Science, Nakhon Sawan Rajabhat University, Thailand. There is no single factor that contributes to student dropouts, there are a number of different factors involved. This study has found that issues can be grouped in four major factors: 1) student family status 2) personal reasons 3) university support 4) the attitudes toward the learning and reasons for dropout. Furthermore, Confirmatory Factor Analysis (CFA) was research design for assessing the measurement model of latent constructs and to confirm the ability and assess the validity and reliability of a latent constructs. The vast majority of dropout students were female. Most of the dropouts were in the Accounting Program, closely followed by students in the Hotel and Tourism Management Program, and the least were in the Business Economics Program.

First, the measurement model analysis of latent constructs of Student Family Status, the factor loading all of latent constructs is significantly different from zero at level 0.05. The indicators used to measure the constructs with the highest precision in measurement is the parental do not support them and the least precision is parental don’t give advice to them. The model with set hypotheses and empirical data were shown to be goodness of fit at an acceptably low level.

Second, the factor loading all of latent constructs of Personal Reasons is significantly different from zero at level 0.05. The indicators used to measure the constructs with the highest precision in measurement is frequent absence from the university and the least precision is negative relationships with peers. The model with set hypotheses and empirical data were shown to be goodness of fit at an acceptably good level.

Third, the factor loading all of latent constructs of University Support is significantly different from zero at level 0.05. The indicators used to measure the constructs with the highest precision in measurement is inadequate academic activity and the least precision is instructors seem did not responsibility. The model with set hypotheses and empirical data were shown to be goodness of fit at an acceptably good level.

Fourth, the factor loading all of latent constructs of the Attitudes Toward the Learning is significantly different from zero at level 0.05. The indicators used to measure the constructs with
the highest precision in measurement is then on beneficial courses and the least precision is
course provided cannot meet their need. The model with set hypotheses and empirical data
were shown to be goodness of fit at an acceptably moderate level.

Finally, the factor loading all of latent constructs of the Reasons for Dropout is significantly
different from zero at level 0.05. The indicators used to measure the constructs with the highest
precision in measurement is program do not meet their needs and the least precision is failing
grades. The model with set hypotheses and empirical data were shown to be goodness of fit at
an acceptably low level.

The result of this research should be useful to people who are involved with educational
programs, so that they will be able to understand the causes of the students’ dropout. By doing
so, the educational developers can use this information to set education plans to address the
issues and tailor them to the individual institutions. The result should be a tangible and effective
reduction in the dropout rate.

Limitations

This is a survey and statistic study research. It was not meant to be an experimental
research; therefore, this research has limited information. The following are suggestions for future
research:

1. This research is a quantitative research which is based on survey and collective
information from prior students of the Faculty of Management Sciences at Nakon Sawan Rajabhat
University. The main problem is the lack of accuracy in the past students information stored in the
university database, an example of this is the information of the dropout students in the database
showed that some of the dropout students had returned to study. However, the study and
investigation found that there was a group of students who had their registrations duplicated in
more than one field, being recorded as both dropout students and existing students. Additionally,
the prior students of Faculty of Management Sciences at Nakon Sawan Rajabhat University did not
place importance on this kind of study, and therefore, only a minority responded to the study. As
a result, the analysis of this research was based on only 147 representative samples which was not
a great volume for the study. Nevertheless, the number of responses was sufficient for the theory
analysis to performed.

2. This research was done with limited time available. Thus, the result of this study may
be incomplete especially the matter of factors which may not cover all possible dropout causes
of the students. In current circumstances, there are numerous conditions which provoke difficulties
for the students leading to the dropout; and that requires a reasonable amount of time to study.

5. Acknowledgment

This research was supported by the Faculty of Management Science, Nakhon Sawan
Rajabhat University. The authors are grateful to the feedback from the students who have left
education prematurely. Finally, I would like to thanks all my best friends including Director, The
Office Academic Promotion and Registration, Nakhon Sawan Rajabhat University.
6. References

[7] The Office Academic Promotion and Registration.(2558). List of student name separate by room
A Simple Model of Biogas Production from Community Waste and Gas Tank Compression

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Abstract

System that suitable for the conventional community is studied. The main structure of the community solid waste is the organic waste that needs to be eliminated for environment protection. Organic waste is sometimes called wet garbage that decomposes to the high deposit microorganism due to culture of some diseases. Biogas is produced by the organic waste from the fermentation process and it could be controlled by the production system. This biogas system is made by the available material and equipment in the community. Production biogas from the system is measured in average of 30.2 litre per kg of organic waste. A good fuel quality of biogas production for general using is scrubbing and compression to tank that obtains by 2 experiments. First is biogas scrubbing by the experiment for removing the contaminated gas in especially hydrogen sulfide that corrode to the engine, and second is the bottling gas by the compression equipment into the gas tank. The experiment of scrubbing to remove hydrogen sulfide was used by iron wool and activated carbon as adsorbents and compared the results. The activated carbon scrubbing result is better than the iron wool by the efficiency of activated carbon adsorption is 99.99%. The less hydrogen sulfide is meant this biogas is safe for using in engine since there is no corrosion. The process of bottling biogas to the tank by using the LPG tank for saving to the system and the biogas is compressed to the tank with the pressure and the mass of 15 bar and 0.2 kg respectively.

Keywords: Community solid waste, Biogas fuel. Gas tank

1. Introduction

Biogas is produced from the organic fermentation in especially the organic waste that pollutes to the community by the large quantity and disease. The transformation method of the organic waste to the fuel for removing the waste is the special method to reduce the high moisture waste since there is not ignite by the simple way. Organic waste is the good raw material for producing biogas by anaerobic digestion from the fermentation by some microorganism. The organic food waste is digested by microorganism and reduces the large molecules of protein, carbohydrate, fat to smaller molecules and finally biogas. The main
composition of the biogas is methane of about 50-70% and carbon dioxide of 30-40% and the other gas such as nitrogen, hydrogen sulfide and vapor is around 2% (Lam and Heedge, 2011, p.6). Recently in community uses liquefied petroleum gas (LPG) for many activities such as cooking, vehicle fuel, and engine as a general power source. The demand of this fuel is increased depended on the variation of activities. There are the problems of fossil fuel crisis depletion and pollution in the environment in community. Both problems take a new way to reduce the waste and find the renewable energy source. Renewable energy is clean and free energy in this case the community solid waste is a raw material of renewable energy since it could be transformed to be biogas, a good clean fuel renewable energy. The capacity of biogas as fuel is take a good advantage for saving cost of energy consumption. In addition, the community needs to clean and protect the environment by the good method of reduction the solid waste. The solid waste is transformed to be biogas and replace to LPG which the quality of purify fuel and compact for using in the storage tank. Biogas fuel is cleaned for purifying by scrubbing and compression to the tank by the simple equipment as the same with LPG. In daily life, the community equipment and simple technology is available for modifying with the suitable technology of the biogas production to a high quality production system. The community people life quality is developed by cleaning environment without the garbage and solid waste, and the biogas energy fuel can support sufficiently to their activities, therefore the technology of transferring the solid waste to be the community fuel is selected to apply by the size of community and the cost investment. (Gaikward and Katti, 2014, pp.184-187).

Objectives

The study aims to produce biogas fuel from the organic solid waste and select the good scrubbing material for removing hydrogen sulfide and compressed the biogas to the LPG tank for using in household as fuel for engine and cooking.

Principle of biogas production and scrubbing

The community biogas plant is installed follow the basic principle of fixed dome biogas technology that available and well done in many communities. The system is modified by using the local materials and solid waste as a raw material such as biogas reactor use a jar vessel as a simple reactor called the digester part that connect to the other parts as shown in Figure.1(Lam and Heedge, 2011, p.8).

Figure.1 the community biogas system made from the jar buried in the ground and the connection
From figure 1, the components of the community biogas system is the inlet mixing tank (1) for collecting the organic solid waste and flows to the digester part (3) that installed at the lower level from (1), this component is operated by the organic waste flows to this digester part for decomposing by microorganism and produces the biogas that flows out into the connecting outlet tube (2) to the biogas storage tank (6), and the surplus organic waste after reaction is released by the excess outlet chamber (4) for depositing the fertilizer and the overflow tank (5) for removing out. The biogas storage tank is connected to the cleaning gas set for removing some contaminate gas that harmful to the application equipment in especially hydrogen sulfide. Biogas produced from the food waste or animal waste including with the leachate is measured the gas components is mixed by methane (CH\(_4\)), carbon dioxide (CO\(_2\)), and hydrogen sulfide (H\(_2\)S) and other of 685.8%, 24.2%, and 2% respectively. This biogas fuel is a good fuel by CH\(_4\) as the same gas of natural gas for vehicle (NGV) due to CH\(_4\) is over than 50% for showing fuel capacity. Some equipment using the biogas fuel is neglect of the scrubbing such as conventional stove burning (Ilyas, 2006, pp. 127-130). The biogas fuel storage tank is used as the same to the gasoline fuel and the gas compression technology for the storage tank is modified. H\(_2\)S is a toxic gas that reacts with the air moisture to be sulfuric acid that corrodes to the engine or the metal. There is many technology of removing the H\(_2\)S such as the capturing by iron wool, scrubbing with the water or sodium hydroxide, and the adsorption by the activated carbon (Vijay, Chandra, Subbarao and Kapdi, 2006, pp1-6).

2. Experimental and results

The digester part made from the jar which the volume of 200 litre is fed by the food waste, animal waste and leachate from the water that deposits at the bottom of the garbage container. The total solid (TS) is measured of 5% and the carbon nitrogen ratio (C/N) is over 25 that suitable for producing biogas. In the experiment, fermentation time is around 20-30 days for producing the biogas of 30.2 liter for 1 kg by the waste and the peak of production temperature is 40\(^\circ\)C and 55\(^\circ\)C according to the characteristic of mesophillic temperature range and thermophillic temperature range. The CH\(_4\) in the producing biogas temperature at 40\(^\circ\)C is 57%, the CO\(_2\) and the other gas is 35% and 8% respectively in the time of 21 days. The CH\(_4\) in the producing biogas temperature of 55\(^\circ\)C is 60% the CO\(_2\) and the other gas is 32% and 8% respectively with the time of 11 days nearly to the works of Ahring et al, (Ahring Ibrahim, Mladenovska, 2001, pp.2446-2452). Some of raw material is produced include hydrogen sulfide such as animal dung, pig or cow dung that measure of over than 8,000 ppm and needed to remove from the biogas by the most effective adsorbent with the equipment that made from the simple material, in the experiment, the activated carbon which suitable porous size that the same of the H\(_2\)S molecular size or bigger. Adsorption experiment is set up by contain the adsorbent in the column equipment and connect to the outlet biogas.
tube as shown in figure 2 that nearly to He et al works, (He, Xia, Wang, Pan and Fang, 2011, pp773-778).

Figure 2 the H$_2$S removing equipment by the adsorption of activated carbon.

The experiment of the adsorption H$_2$S by using the simple equipment in figure 2 is set up and measurement the biogas at inlet and outlet from the equipment with the gas analyzer, a model of biogas check from Geotech company to compare between iron wool and activated carbon adsorption and the result is shown in figure 3 and figure 4.

Figure 3 the inlet and outlet of H$_2$S adsorbed by the activated carbon

Figure 4 the inlet and outlet of H$_2$S adsorbed by the iron wool

From the figure 3 and 4, shows the H$_2$S removing efficiency of activated carbon is better than the iron wool. The less of H$_2$S outlet biogas and the time for using of the activated
carbon is longer than the iron wool. The experiment is compared from the mass of 0.5, 1.0, and 1.5 kg, the results is not difference in the adsorption result but the time is slightly increased due to the mass increasing. For 1.0 kilogram of activated carbon, the time for adsorption is 70 hours and the outlet biogas is contaminated with H$_2$S at less than 100 ppm. The biogas for standard using in the engine fuel is contaminated with H$_2$S less than 500 ppm for protection the engine corrosion (Nallamothu, Teferra and Rao, 2013, pp. 34-38). This result shows that the H$_2$S adsorption by the activated carbon is more effective from the outlet amount of H$_2$S less than 100 ppm that safe for the engine. Simple compression of the biogas to the storage tank for the modified fix dome is done by the weight exerts on the cover on the gas digester part. The pressure measurement from the experiment by using the 65 kg weight to compress the biogas digester part and the pressure is measured of 1.5 bar. Increasing biogas pressure by the weight at the top of the digester part is simple and more application by the simple material available in the community. Some biogas consumption equipment needs high pressure from the compressed biogas tank by the compression of the air pumping that drives by the engine or motor. The basic equipment of compression is the safety tank for high pressure biogas that available in community storage tank of liquefied petroleum gas, LPG that safe for the experiment (Ruo, et al, 2013, pp. 34-36). Electric motor capacity of 2 hp was used to be a source of biogas compression, and the conventional of gas storage tank capacity is 4 kg, then the pressure and time of the biogas compression is measured as shown in the figure 5.

![Figure 5 the pressure of the biogas storage tank of 4 kg with various times](image)

From the figure 5, the biogas pressure is measured of 15 bar in 7 min and the biogas weight in the storage tank is 0.2 kg. The cost of the pressured biogas tank is depended on the tank capacity size and the compressor equipment. In addition the compression power is needed to apply by the high pressure the high power engine and bigger storage tank.
3. Discussion and recommendation

The surveying data of the general community in solid waste of Thailand shows that there are many problems of the management about the solid waste for removing and cleaning. The transformation technology of the solid waste to be the fuel is used to reduce the solid waste that composes with the major part of the organic waste by the anaerobic digestion. A benefit of the digestion is the fertilizer from the sediment at the bottom of the biogas reactor or digester part. The biogas production peak temperature is 40°C and 55°C according to the range of mesophilic and thermophilic temperature that show the advantage of the best digestion by bacteria or microorganism. This is the suggestion of the biogas reactor maintenance that keeps the system to the warm and moisture place. In addition the location of the biogas system is taken the advantage of cleaning in nearby area by reducing the solid waste. Although the local biogas system is not applied by heat, the biogas production is lower than the mesophilic or thermophilic range but the system still produces by the longer time of production. Activated carbon is selected for adsorbing H₂S due to the high effective of less than 100 ppm in the output for using in the engine safely and there is the new technology to cleaning the community biogas.

4. Conclusion

The biogas system capacity is designed for using by the raw material in the community that suitable to the area capacity and the investment cost. Biogas capacity is depended on the quantity of organic solid waste or food waste, animal dung and leachate, and for installation by sizing the system by the amount of 30.2 litre for 1 kilogram of organic solid waste. The application of the research to the various size of the community is modified by the organic solid waste and the problem of organic solid waste that needs to remove by transforming to the energy fuel that uses in the household and community. The best efficiency of scrubbing biogas for removing H₂S is activated carbon adsorption that reduces H₂S out of the system until less than 100 ppm in the outlet. Fertilizer is the additional product that useful for the agricultural and reduces the cost of the plant crop fertilizer. Storage tank is the method to keep biogas for using in various applications such as the engine. Compressed biogas is presented by the experiment for using the available community equipment and the results is found that there is high pressure to 15 bar when compress the biogas 0.2 kg in the 4 kg LPG tank.

5. Acknowledgement

The author would like to thank Naresuan University, Thailand for financial support of the research project and also thank to School of Renewable Energy Technology, Naresuan University Thailand for providing the research facilities.
6. References


Effect of Packages and Consumer Accepted on Ozonated Jasmine Rice Mixed with Milled Rice

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Abstract

Fumigation of 100 ppm ozone gas flow 25 mL/min on Jasmine rice mixed with milled rice ratio of 3:1 in different packages were investigated. 500 g the mixed rice contained in polyethylene (PE), polypropylene (PP) and vacuum (Vac) bags compared with ozonated on the mixed rice in the packages for 1 min/bag and then storage at room temperature for 6 months. It was found that the mixed rice in the Vac bag without ozone and the PE bag with ozone showed the least of lived insect’s number throughout the storage time, but no effect of white index. Moreover, the mixed rice with ozonated had significantly the highest score of consumer’s acceptance after cooking more than no ozone treatments. And the mixed rice with ozone was showed the longest time on table. Finally experiment, 400 g of the mixed rice with 100 ppm ozone fumigated into closed PE box for sale in the Nakhon Sawan Rajabhat University. The result showed that, the mixed rice in the closed PE box and ozone gas had increased storage time without insect more than 1 year. However, the consumers had suggested to other design package or bigger size of the mixed rice packed.

Keywords: Jasmine rice, white index, ozonated

1. Introduction

Rice is one of the economic value important grains. Although much progress has been achieved in the prevention of losses in rice post-harvest, these losses reach between 15 and 16% of the production and occur during operations such as drying, storage and milling (FAO, 2004). The main reasons are the attack of biological agents such as insects, fungi and mites (Alencar et al., 2012).

An efficient strategy that has been suggested is ozone. It is a one of advance oxidation technology (AOTs). It is a gas that is sensitive to chemical reactions, a strong oxidizing agent and has little toxicity. It is generally recognized as safe (GRAS) for food. Ozone has been widely used in the food industry. This is alternative method to control insects and no need to use chemical required.
Ozone fumigation has effect to killed insects, reduced residue and inhibition of grain, but no effect of the grain qualities. (Tiwari et al., 2010). Ozone fumigation 13.9 mg/L on wheat was showed percentage of 72.6 % Tribolium confusum dead and 90 - 100 % of the adult insect (Isikber and Oztekin, 2009). Accordingly by ozone fumigation to killed insects in storage such as Tribolium castaneum, Rhyzopertha dominica, Oryzaephilus surinamensis, Sitophilus oryzae and Ephestia elutella (Sousa et al., 2008)

The ability to keep milled rice for long periods of time in ozone combination with different kind of plastic bags has been an ongoing study.

The objective of the present work was to study the effectiveness of packages and ozonation for quality and consumer accepted on Jasmine rice mixed with milled rice during storage time.

2. Materials and Methods

Rice samples

Two Thai rice varieties (Oryza sativa L.) were studied into Jasmine rice RD.105 from Surin province and milled rice RD.31 from Nakhon Sawan province, Thailand. The Jasmine rice was mixed with milled rice in 3:1 ratio.

Ozone treatments

Ozone gas, produced by an ozone generator (Ozonizer, Sky zone model S05AE, Thailand), with concentration at 100 ppm and a flow rate of 25 mL/min, was put into the 500 g mixed rice directly in 3 different bags such as polyethylene (PE), polypropylene (PP) and vacuum bag (Vac) compared with ozone treatments.

Milled rice quality analyses

Lived insect number in the mixed rice treatments were counted for 5 replicates. The mixed rice were determined color changed with regard to lightness (L*), redness (a*) and yellowness (b*) by chromameter (Aunter Lab, Model Color Quest XE) during storage for 6 months. Ten samples were taken with white index (WI) was calculated according to the following formula Chen et al. (1999):

\[ WI = 100 - \sqrt{(100 - L*)^2 + (a*)^2 + (b*)^2} \]

Cooked rice analyses

The mixed rice treatments 300 g were cooking with 450 ml water. Then consumer’s acceptance such as color, flavor, and texture of the mixed rice were tested from 15 consumers (4 replicates) in Hedonic score (0 – 9). The mixed rice treatments after cooking were observed the storage time on table (hours). The both were measured every month for 6 months.

Sample package marketing in Nakhon Sawan Rajabhat University

400 g of the mixed rice with 100 ppm ozone fumigated into closed PE box for sale in faculty of Agricultural technology and industrial technology, Nakhon Sawan Rajabhat University was studied insects number and consumer suggestions.
Statistical analyses

All experiments were replicated four times and evaluated with a regression procedure using the SPSS. Duncan’s Multiple Range Test (*P ≤ 0.05) was performed to determine the significant difference among various treatments.

3. Results

Table 1 showed lived insect’s number on the ozonated mixed rice for 6 months. It was found that, lived insects were initial found at 3 months of PE bag and PP bag without ozone treatments but the mixed rice in vacuum bag and all ozonated treatments were found lived insects at 4 months. For 6 months, the mixed rice in the vacuum (Vac) bag without ozone (103.25) and the PE bag (101.75) with ozone were showed the least of lived insect’s number as 8 folds of the PP bag without ozone treatment (801.50). All treatments were not significantly change of white index throughout storage time (Figure 1).

Table 1 Lived insect’s number on the ozonated mixed rice (per 1 kg) for 6 months

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Storage time (months)*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>PE</td>
<td>0.00a</td>
</tr>
<tr>
<td>PP</td>
<td>0.00a</td>
</tr>
<tr>
<td>Vac</td>
<td>0.00a</td>
</tr>
<tr>
<td>PE+O3</td>
<td>0.00a</td>
</tr>
<tr>
<td>PP+O3</td>
<td>0.00a</td>
</tr>
<tr>
<td>Vac+O3</td>
<td>0.00a</td>
</tr>
</tbody>
</table>

*(Mean ± S.D., n=4); Different letters in the same column indicate significantly different at p ≤ 0.05.

Figure 1 White index on the ozonated mixed rice during storage
After rice cooking, the mixed rice was observed storage time. It was found that, the mixed rice without ozone treatments were significantly short time than the ozone treatments almost 20 hours (Figure 2). The ozonated mixed rice showed significantly the highest score of consumer’s acceptance when compare with the without ozone treatments. Therefore, significant interaction effects occurred mostly due to ozone treatment in PE bag. Moreover, packing of the ozonated mixed rice in closed PE box could supported increased storage time without insect more than 1 year, but other design and bigger size of the mixed rice packed were suggested by consumers.

![Figure 2 The ozonated mixed rice cooked time on table](image)

**Discussions**

This studied used the application of ozone fumigation to insects controlled. Ozone fumigation into bag or box was modified atmosphere in the package, as the atmosphere was not suitable for insect growth. It’s a strong oxidant of safe use many fields. Ozone toxicity on stored-grain insects was evaluated in several laboratory and field studies. Different structures and chemical components would influence the reaction of ozone on the surface of the materials (Jian et al., 2013). Accordingly by Nur et al. (2015) treated rice by ozone showed no insects although it has been stored for 12 months. The analysis of fat, water, and protein, ash, and carbohydrate that content in rice before and after treatment by ozone results that there is no significant change. Moreover, cooked rice had showed good flavor more than no ozone treatment because of oxidized the surface of the mixed rice, aroma characteristic was 2-acetyl-1-pyrroline (2AP) might be increased. It present in rice will depend on postharvest treatments and storage duration (Widjaja et al., 1996). In further work, the ozone mechanism to insects and analysis of characteristic aroma is 2AP content on storage period will research. Moreover, other design or bigger sizes of the package are required to check the qualities of the mixed rice.
4. Conclusions

The mixed rice in the Vac bag without ozone and the PE bag with ozone showed the least of available insects number. The ozonated mixed rice showed the highest score of consumer’s acceptance and extended period of storage after cooking. Packing the ozonated mixed rice in closed PE box could support increased storage time without insect more than 1 year, but other design and bigger size of the mixed rice packed were suggested.

5. Acknowledgment

The authors acknowledge financial support from Research and Development Institute, Nakhon Sawan Rajabhat University. This research was conducted in Faculty of Science, Chiang Mai University and Faculty of Agricultural Technology and Industrial Technology, Nakhon Sawan Rajabhat University which provided the laboratory facilities.

6. References

Ayurvedic Philosophy as Cultural Capital for Creative Economy, Ayurveda in Nakhon Sawan

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Abstract

Research on Ayurvedic philosophy as cultural capital for creative economy aims to study factors of faith Systems about the therapeutic care of patients and Ayurveda providers in Nakhon Sawan, its wisdom, values and ideals, Health and metaphysics. Both the client and the service provider. The analysis Ayurvedic philosophy as a cultural capital, just to guide the creative economy ayurveda in Nakhon Sawan. By the way, the study found that Ayurveda is a Sanskrit word that means "science of life" comes from “Ayus”, which means "life" and "lifestyle" or "longevity" with the word “Veda” means "to know," "knowledge," "wisdom" or "science" of faith. Its system provides a therapeutic massage therapy also aroma therapy herbs or spa room is available at Khlong Khang temple and Deva Samakeedham temple in Nakhon Sawan district, Thailand. In accordance with the Indian Ayurvedic philosophy of life and the belief of cosmology of life in human body. The Hindu Ayurveda India believes that the holy teacher is the incarnation of Lord Vishnu, a God's name is Dhanwantri or Dhanwantari while Thai holy teacher hold of the Maharishi’s Jiva Ga Kumar bhatta, who is the ayurvedic medical doctor in Buddha periods. A similarly between ayurvedic philosophy India and ayurveda Nakhon Sawan’s massage are stream herbs in temple beliefs believe with the treatment will be better from bone disease as cultural capital of supernatural teacher’s Dhanwanti or Dhanwantari and Jivaga Kumar Bhatta. Metaphysics of ayurvedic Indian is tridosha treatment are also similar to ayurveda approach in Nakhon Sawan as the helping them to teach worship the lord, supreme teacher those whom wishing to study the treatment. The regular income that Ayurveda Nakhon Sawan community supports cultural capital existence as intangible goods such as ideas, beliefs, in the way of the superstition in which the ancestors definitely allow the fellowship continue cultural capital worship to their own Guru so that Capital of Culture of herb and massage heal the fellowship to earn their own income, economy as a simply way of wealth or healthy life.

Keywords: Ayurvedic philosophy, Ayurveda Nakhon Sawan, Capital Culture, Creative Economy
1. Introduction

The cultural capital is the intangible cultural heritage of the Department of Religious Affairs of the Ministry of Buddhism and Thai Culture, which has seven branches in language, folk literature, performing arts, social practices, rituals and ceremony, traditional craftsmanship. Knowledge and practices concerning nature and the cosmology of wisdom, sports, Thai's cultural wisdom is an important of social capital. (Encyclopedia Thailand for Youth, 2553: 33) A driving force to strengthen the nation’s everlasting was instrumental in developing the human as cultural capital to strengthen of the country. (John Hawkins, 2001: 10) who wrote a book called The Creative Economy: How People Make Money from Ideas. and UNCTAD (United Nations Conference for Trade and Development) held heritage or cultural heritage is an industrial group with respect to history, archeology, culture, traditions, beliefs, and social conditions into 2 groups. First is a traditional cultural expression such as arts and crafts. Festivals and celebrations, second is Cultural Sites as historic museums, libraries and exhibition, etc.

But the current expansion of demand for cultural goods and services are push and a chance to achieve economic growth by developing a new source of revenue for the country and the opportunity to develop and rely on the domestic market for more. The problem is the lack of mechanisms to integrate and link the performance and channel knowledge and opinions of organizations that support the development of the creative economy, such as the Office of Management, cognitive development and Protection Agency, intellectual property and so on. The operations within the meaning of the creative economy. A different direction (Kairiksh Pinkaew, 2553: 33), resulting in a lack of consistency and performance characteristics are not mutually supportive also relevant agencies to give priority to the development of the creative economy is relatively small.

Therefore, the development of the creative economy is the driving force. All relevant sectors, to study and understand the Value Chain of the production and distribution of goods, including the creation of a network linking various parts to adopt policies to support or intervene the process at the proper development of the creative economy.

2. Methodology

The paper, a qualitative research is used. It has brought the Indian Ayurvedic philosophy as a pre-model for the study of Ayurveda in Nakhon Sawan, at Khlong Kang temple (Wat Khlong Kang) herbal massage community. By with a technical way of examine by the texts, observations and interviews.

Ayurveda as it is:

Ayurveda is the traditional science of Ayurvedic medicine is designed to bring the body back into balance so it can heal itself, which in itself is amazing, but underneath all of that, Ayurvedic medicine is so much more. Ayurveda is a Vedic science which, like yoga, has
only one purpose: to expose the illusion and neediness of the mind and become free. (John Douillard, 2016:1-5)

Ayurvedic medicine -- also known as Ayurveda -- is one of the world's oldest holistic (whole-body) healing systems. It was developed thousands of years ago in India. It is based on the belief that health and wellness depend on a delicate balance between the mind, body, and spirit. The primary focus of Ayurvedic medicine is to promote good health, rather than fight disease. But treatments may be recommended for specific health problems. In the U.S., Ayurveda is considered a form of Complementary and Alternative Medicine (CAM).

Ayurveda, the Ancient Treasure of India Right from a peasant to a president, everyone craves for some treasure. A commoner may view treasure as a worldly pleasure, whereas a sage considers it as becoming one with God. Known for its rich natural and cultural heritage, India is a land of spiritual values, which is ruled by the most celebrated emperor of all ages known as Ayurveda. This holistic, spiritual and absolute healing medical practice is serving the humanity for nearly 5000 golden years and has attained great heights due to its incredible theories and attributes, for which it is rightly called as the Ancient Treasure of India.

Ayurvedic Philosophy:

According to Ayurvedic theory, everything in the universe -- living or not is connected. Good health is achieved when your mind, body, and spirit are in harmony with the universe. A disruption of this harmony can lead to poor health and sickness. For followers of Ayurveda, anything that affects your physical, spiritual, or emotional well-being can cause you to be out of balance with the universe. Some things that can cause a disruption include Genetic or birth defects Injuries Climate and seasonal changes Age Emotions

How the body works to keep person healthy and our unique physical and psychological characteristics combine to form our body's constitution, or prakriti. our prakriti is believed to stay the same for our entire life. However, how we digest food and eliminate waste can influence it. Every person is made of a combination of five basic elements found in the universe are Space, Air Fire, Water and Earth. These elements combine in the human body to form three life forces or energies, called doshas. They control how our body works. The three doshas are Vata dosha (space and air), Pitta dosha (fire and water), Kapha dosha (water and earth)

Figure 1 combination of five basic
Everyone inherits a unique mix of the three doshas. One dosha is usually more dominant. Each dosha controls a different body function. It is believed that our chances of getting sick are linked to the balance of our doshas.

**Vata Dosha**
Vata dosha (space and air) is thought to be the most powerful of all three doshas. It controls very basic body functions, such as how cells divide. It also controls our Mind, Breathing, Blood flow, Heart function

Ability to get rid of body waste through the intestines Things that can disrupt this dosha are Eating dry fruit, Eating too soon after a previous meal, Fear, Grief, Staying up too late. If vata dosha is our main life force, we are more likely to develop Anxiety, Asthma, Heart disease, Nervous system disorders, Rheumatoid arthritis, Skin problems.

**Pitta Dosha**
The pitta dosha (fire and water) controls Digestion, Ability to break down foods (metabolism), certain hormones linked to appetite. Things that can disrupt this dosha are eating sour foods, eating spicy foods, Fatigue, Spending too much time in the sun. If pitta dosha is our main life force, we are more likely to develop Anger and negative emotions, Crohn’s disease, Heart disease, Heartburn a few hours after eating, High blood pressure, Infections.

**Kapha Dosha**
The kapha dosha (water and earth) controls Muscle growth, Body strength and stability, Weight, Immune system. Things that can disrupt this dosha are daytime sleeping, Eating after our stomach is full, eating or drinking items that have too much salt or water, eating too many sweet foods, Greed. If kapha dosha is your main life force, you are more likely to develop Asthma and other breathing disorders, Cancer, Diabetes, Nausea after eating, and Obesity

**Ayurveda at Present:**
The Ayurvedic encyclopedias were translated into many foreign languages including Arabic, Latin, German and English thus spreading the true knowledge in healing mankind. With its essence spread to the world, Ayurveda is now gaining global attention since this is the only holistic healing approach that alleviates ailments, prevents recurrence of diseases and treats humanity without leaving any traces behind in the form of side effects. A word Ayurveda comes from the word "Ayus" means living longer and "Veda" means knowledge. Which means science or knowledge of life. Ayurveda acts as an effective stress-buster by calming the human mind, cultivating positive thoughts leading to a healthy living.

**The philosophy of Ayurveda** is based on the metaphysics of five elements Ayurvedic medicine (Indian Herbo-Mineral System) is an ancient most system of medicine. In Sanskrit language "AYU" means LIFE and "VEDA" means Knowledge or Sciences. So, whole word "AYU: VEDA" means- "The Science or Knowledge of Life". This contains a comprehensive and
complete natural Herbo-mineral health care system. Ayurveda combines holistic assessment and diagnosis with diet, exercise and Herbo-mineral medication. Ayurveda is a system about right living and right eating. Ayurveda is concerned with achieving balance in body and mind by restoring the balance of three elements. Or factors...VATA, PITTA and KAPHA (Air, Fire and Water) of which the body is made. Lightness is considered a state of normalcy. The unique principle in Ayurveda is this: Each and every person has his/her own individual body constitution according to three elements Vata, Pitta and Kapha.

Ayurveda as Capital of Culture:

Ayurveda as Capital of Culture (Throsby, 2001: 24), cultural capital (cultural capital) is not a financial institution. Assets, such as intellectual, social studies, history or lifestyle characteristics that are unique to the community. Values, social values, a common expression. Communities with a foundation of knowledge, wisdom. Intellectual property accumulated in the past. Valuable human and social needs. "Capital of Culture" is vital to the economic and social development. Capital of Culture is a dynamic high. The world today has to contact each other quickly and easily David Throsby definition of the term that refers to the Capital of Culture "intellectual property accumulated in the past. Valuable human and social needs. In addition to Economic value, "David Throsby describes the relationship between cultural capital to economic development that follows.

1. To enhance efficiency in the economy. Wizard allows people to pursue a career related to culture monetize the local economy, promote cultural tourism. The souvenir

2. Foster social justice, such as the belief that people are born into a wealthy benefactor. Should help poor to be kind to fellow humans.

3. May influence the targeted economic and social development of individual and collective goals such as working enough to eat, not accumulated wealth too. Do not risk too much speculation (Throsby, 2001: 46).

Pierre Bourdieu (Kairiksh Pinkaew, 2554: 33) explains that the Capital of Culture will appear in three forms.

1. It is embedded in a person or group of people like the idea that imaginative initiatives.
2. What is the look and identity, such as painting equipment, building a world heritage site?

3. The adoption of such rules that many. People together the adoption of the monarchy as a school, causing harmonious coexistence of tradition or social activities. Cultural capital is worth and their value to the life of society in some way, for example, makes social harmony together. Help organize society in economics, it is the cause. Utilities, Social Policy Capital of Culture, but it is ephemeral. It changes according to the environment and technology, such as weaving a traditional way of life in Thailand. When plant There used to which can be woven quickly and cheaper or when a new medicine to replace. Traditional medicine the needs of people began to change. Culture is a product you have (Merit goods) in the sense economically. The production and consumption of goods is not only the pleasure of the sexual and cultural shows. But there are also benefits to society, such as education or the most beneficial to the students. Is made up wage positions better. It is also beneficial to the public. Reduce the burden on society Cultural capital is worth and their value to the life of society in some way, for example, makes social harmony together. Help organize society in economics, it is the cause. Utilities, Social Policy Capital of Culture, but it is ephemeral. It changes according to the environment and technology, such as weaving a traditional way of life in Thailand. When plant There used to which can be woven quickly and cheaper Or when a new medicine to replace. Traditional medicine the needs of people began to change. (National Economic and Social Advisory Council, 2549: 6).

Creative (creative economy) have introduced the concept of the creative economy at the John Howkins, (2013: 14) focus on the "people" as a key resource. The idea is to create a system of belief and expression into cultural creativity Wutichai audacious Commerce (2553: 136-140) explains, branding the Capital of Culture. Such as the use of natural home spa Capital of Culture as part of the development by bringing knowledge about the traditional herbal medicine. The disease is treated with a combination of herbs is the concept of cultural storytelling to enhance the attractiveness of Eastern culture. Culture makes a difference Or selling the goods.

3. Results and Discussion

The content of Ayurveda Medical Science and Metaphysics means that humans are just a small unit of the universe, Ayurveda Science is part of human nature that teaches the link between man and the universe. Human small units, the replica of the universe, the universe, so it’s part of men.

Ontology of Ayurveda at Khlong khang temple, the community of massage and stream herbal spa Nakhon Sawan. Therefore they provide what is today called "Thai massage" or "Thai yoga massage" is an ancient healing system combining acupressure, Indian Ayurvedic principles, and assisted yoga postures. In the Thai language it is usually called nuat phaen
"Thai-style massage" or nuat phaen boran "ancient-style massage", though its formal name is merely nuat thai "Thai massage" according to the Traditional Thai Medical Professions Act, BE 2556 (2013: 4). The art form is also commonly known as "yoga massage" or "Thai yoga massage", as the practice is essentially a form of assisted yoga performed by the giver, with the receiver completely passive throughout. The founder of Thai massage and medicine is said to have been Jivaka Komarabhatta, who is said in the Buddhist canon to have been the Buddha's physician over 2,500 years ago. He is noted in ancient documents for his extraordinary medical skills, his knowledge of herbal medicine, and for having treated important people of his day, including the Buddha himself.(Ibid, p. 5)

In fact, the history of Thai massage is more complex than this legend of a single founder would suggest. Thai massage, like Thai traditional medicine (TTM) more generally, is a combination of influences from Indian, Chinese, Southeast Asian cultural spheres, and traditions of medicine, and the art as it is practiced today is likely to be the product of a 19th-century synthesis of various healing traditions from all over the kingdom. (Ibid, p. 6) Even today, there is considerable variation from region to region across Thailand, and no single routine or theoretical framework that is universally accepted among healers.

Economics and Culture: David Throsby, professor of economics at Macquarie University in Sydney, Australia, attempts to provide a framework within which we can apply economic concepts while thinking about cultural issues. Throsby writes as one who has been in the thick of a relatively new economic field termed cultural economics. He has coauthored The Economics of the Performing Arts, a standard text on the subject, and is a past president of the Association for Cultural Economics International. Throsby further tries to distinguish between economic and cultural value by appealing to collective valuation. He argues that the cultural impulse, the motivation people have to produce and experience culture, is a collective impulse, a “desire for group experience or for collective production or consumption that cannot be fully factored out to the individuals comprising the group” (David Throsby, p. 13). Throsby provides no support for this assertion, other than merely claiming that much art is produced and consumed as a group activity “moved by a sense that the group experience transcends that of the sum of the individual consumer responses” (pp. 13–14).

Throsby does not want to merely develop an academic definition of cultural value. He uses it to develop the concept of cultural capital, which he defines as “an asset which embodies, stores or provides cultural value in addition to whatever economic value it may possess” (p. 46). Accordingly, cultural capital can exist in tangible goods such as buildings, museums, and paintings, as well as in intangible things such as techniques, ideas, beliefs, and customs (p. 46).

Ayurveda as a Cultural capital can be said that the traces of Ayurveda, the Hindu society, appears in Thailand for a long time as a medicinal massage at Wat Pho, Bangkok. The fellowship appears in Wat Klong Kang temple’s massage and herb spa locates in Muang...
Nakhon Sawan serves any person for holding massage treatment for patients. According to Wat Klong Kang temple’s massage community, the villagers got their career, the villager could create opportunities for a career related to the culture of traditional ayurvedic knowledge.

The master of ayureda massage at Wat Khong Kang is a monk who learned from Wat Deva Samuukeedham temple before providing the same in his home town at Wat Klong Kang. He provides and separates the women massage block from but next to the men massage block including a separation lady spa and men spa with stream herb block. Many people from other places can come to join ayurveda at this place for free, economy price or according to the donation, just because of the body illness, some come for learning or getting private jobs, etc.

The beliefs of people in ayurvedic Nakhon Sawan from the interview they believe in the supernatural teacher (Guru) just because anyone can do the massage well means s/he has their own teacher and for ayurvedic at Nakhon Sawan they respect Guru Dava is Jivaga Kumar Bhatta (the ayurveda medical doctor of Buddha). Everyone should worship their Guru every month at least one in a year. For the Indian people they worship the Deva Dhanwantri, an avatar of Vishnu Dava.

The two main guiding principles of Ayurveda are 1.) The mind and the body are inextricably connected, and 2.) Nothing has more power to heal and transform the body than the mind. Freedom from illness depends upon expanding our own awareness, bringing it into balance, and then extending that balance to the body. This process isn’t as complicated as it may sound. For example, when you meditate you effortlessly enter a state of expanded awareness and inner quiet that refreshes the mind and restores balance. Since the mind and body are inseparable, the body is naturally balanced through the practice of meditation. In the state of restful awareness created through meditation, your heart rate and breath slow, your body decreases the production of “stress” hormones such as cortisol and adrenaline, and you increase the production of neurotransmitters that enhance wellbeing, including serotonin, dopamine, oxytocin, and endorphins.

Meditation is just one of the most powerful tools the ancient Ayurvedic physicians prescribed for balancing the mind and body. Ayurveda also offers many other practices for expanding self-awareness and cultivating your innate state of balance. Here are a few of the most important aspects of the Ayurvedic approach and suggestions for applying them to create perfect health in your own life:

Understand our unique mind-body type and the specific needs that derive from it. Ayurveda is a personalized approach to health, and knowing our mind-body type allows us to make optimal choices about diet, exercise, supplements, and all other aspects of our lifestyle. We can learn more about Ayurvedic mind-body types and find out how to identify our own individual type here.
Eat a colorful, flavorful diet.

Next to breathing, eating is our most vital bodily function. To create a healthy body and mind our food must be nourishing. Ideal nutrition comes from consuming a variety of fresh foods that are appropriately prepared and eaten with awareness. A simple way to make sure that you are getting a balanced diet is to include the six Ayurvedic tastes (sweet, salty, sour, pungent, bitter, and astringent) in each meal. Doing so will ensure that all major food groups and nutrients are represented. When you include all six tastes, you will also notice that you feel satisfied and that the urge to snack and overeat will diminish. Along with the six tastes, filling your plate with the colors of the rainbow promotes a long and healthy life. You can literally ingest the information of the universe into your biology. Foods that are deep blue, purple, red, green, or orange are leaders in antioxidants and contain many nutrients that boost immunity and enhance health.

Get abundant restful sleep.

According to Ayurveda, sleep is the nursemaid to humanity. During sleep, our body repairs and rejuvenates itself. A lack of restful sleep disrupts the body’s innate balance, weakens our immune system, and speeds up the aging process. Human beings generally need between six and eight hours of restful sleep each night. Restful sleep means that you’re not using pharmaceuticals or alcohol to get to sleep but that you’re drifting off easily once you turn off the light and are sleeping soundly through the night. If you feel energetic and vibrant when you wake up, you had a night of restful sleep. If you feel tired and unenthusiastic, you haven’t had restful sleep.

4. Conclusion:

Ontology of Ayurveda or Ayurveda at Khlong khang temple, the community of massage and stream herbal spa Nakhon Sawan. The communities provide "Thai massage" or "Thai yoga massage" from an ancient healing system combining acupressure, Indian Ayurvedic principles, and assisted yoga postures as they believed the same as ayurvedic philosophy of ancient India.

The founder of Thai massage and ayurvedic medicine is said how to learn and how to practice by the respected and worshiped Guru (teacher) Vishnu incarnation (Dhanwantari) and Jivaka Komarabhatta, who is said in the Buddhist canon to have been the Buddha’s physician over 2,500 years.

Accordingly, Ayurveda Nakhon Sawan supports cultural capital existence intangible goods such as ideas, beliefs, in the way of the superstition in which the ancestors allow the fellowship by cultural capital worship the own Guru so that Capital of Culture of herb and massage guide the fellowship to earn their own economy in Nakhon Sawan’s community as a simply way of good or healthy life.
5. References


The Effectiveness of Virtual Experiential Learning (VEL) for Cognitive Load Reduction on Traffic Rules Education.

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Abstract

This article is an initial report aiming to investigate the performance of four learning instruction designs for Virtual Experiential Learning (VEL) framework based on different learning instructional materials. This study compared the learners’ satisfaction of four groups of participants. The results show that the learning instructions designed with multimedia instruction delivered with EL has the highest scores of satisfaction to educate the Thai Undergraduate students on traffic rules. The next phase of this study will investigate the effectiveness of the use of VEL framework, and analyze the relationship between the test outcomes and learners’ satisfaction with an aim to reduce cognitive.

Keywords: Experiential Learning, Multimedia Learning, Traffic Rules

1. Introduction

Road accident is a major cause of mortality in many countries. The Ministry of Public Health of Thailand has also considered road accidents as one of the top three public health problems in the country. Over the years, the number of Thai people killed on the roads has an average figure of about 12,000 per year, or about 2 persons being killed per hour [1]. One of the strategic action plans is to educate young driver in order to improve their understanding of traffic rules and to increase their awareness of road safety. Young driver is the age group between 15 to 29 years has the highest death rate due to road traffic [2]. Therefore, a comprehensive road safety master plan has been developed in Thailand aiming to educate the community on road safety.

There have been improvements on various instructional designs using multimedia learning. With the development of information technology and popularization of computer applications, traditional teaching model has changed to multimedia teaching model. Multimedia teaching model is computer-centered using texts, images, audios, videos, animations and other information carriers in teaching, and creates a more favorable learning environment for learners [3]. IT enables the utilization of multi-sensory channels to convey various forms of information from the learning system to the learners. However, presenting too much information via too many channels may cause missed important information during
learning [4]. This may result in the learner ignoring the content in the process. Hence, the challenge is how to utilize the technology to develop an optimal learning system.

This paper focuses on learners’ satisfaction with different learning instructional designs aiming to examine the learners’ perception on the learning instructions on educating Thai undergraduate students on traffic rules. This study will contribute to knowledge and will provide a better understanding of the use of new educational technologies for the teaching of traffic rules to Thai undergraduate students with an aim to reduce traffic accidents.

**Literature Review**

The instructional technology represented as Multimedia instructions have the capacity to offer powerful presentation to students and learners [5, 6]. Moreover, video-based multimedia material was found to produce the best learning performance and the most positive emotion among different types of multimedia materials [7]. Moreover, Rias and Zaman (2009) showed that a multimedia learning instruction using 3-Dimensional animation could also help learners to study with interest and increased clarity in learning[8]. Success of e-learning systems is based on satisfaction of the user and factors affecting this satisfaction have been researched effectively. There was a test whether computer self-efficacy, with perceived value, perceived quality and perceived usability affect e-learning satisfaction [9]. This found that developers need to consider the self-efficacy issues (such as ease of use, user friendliness) while developing e-learning systems. Research shows that perceived usability, perceived value, perceived quality are critical factors that affect user satisfaction for e-learning systems [9]. Many factors were studied on the effectiveness to user’s satisfaction for e-learning. Researches show that perceived usefulness improves user’s satisfaction with an IS [10], perceived usefulness, perceived ease of use also compatibility improves user satisfaction[11]. Customer satisfaction is directly related to perceived value; it is important to include perceived value in models designed to measure user satisfaction[12, 13].

**Research Question and Hypotheses**

The research question of this study is:

*RQ 1: Which learning instruction is the most satisfying by Thai undergraduate students on educating traffic rules?*

An answer for Research Question is based on the following hypotheses:

**Hypothesis 1:** There will be no significant difference between the mean score of the learners’ satisfaction on traditional instructions delivered with Experiential Learning and the mean score of learners’ satisfaction on traditional instructions delivered without Experiential Learning. \( H_1: \mu_b = \mu_a \)

**Hypothesis 2:** There will be no significant difference between the mean score of the learners’ satisfaction on multimedia instructions delivered with Experiential Learning and the mean score of learners’ satisfaction on traditional instructions delivered without Experiential Learning. \( H_2: \mu_c = \mu_a \)
Hypothesis 3: There will be no significant difference between the mean score of the learners’ satisfaction on 3D based video instructions delivered with Experiential Learning and the mean score of the learners’ satisfaction on traditional instructions delivered without Experiential Learning. (H₃: µ₃ = µ₄)

Hypothesis 4: There will be no significant difference between the mean score of the learners’ satisfaction on multimedia instructions delivered with Experiential Learning and the mean score of the learners’ satisfaction on traditional instructions delivered with Experiential Learning. (H₄: µ₄ = µ₅)

Hypothesis 5: There will be no significant difference between the mean score of the learners’ satisfaction on 3D based video instructions delivered with Experiential Learning and the mean score of the learners’ satisfaction on traditional instructions delivered with Experiential Learning. (H₅: µ₃ = µ₅)

Hypothesis 6: There will be no significant difference between the mean score of the learners’ satisfaction on 3D based video instructions delivered with Experiential Learning and the mean score of the learners’ satisfaction on multimedia instructions delivered with Experiential Learning. (H₆: µ₃ = µ₅)

2. Methodology

Virtual Experiential Learning (VEL) framework is developed in order to educate traffic rules in this study. VEL framework is combined Experiential Learning techniques in a framework comprises of traditional learning instructions, multimedia instructions, and 3D based video instructions via the Internet [14]. Learners’ satisfaction will be measured how user satisfies with learning instructions provided from the VEL framework on educating road traffic in Thailand which influenced user’s learning continuance intention. The results yield a significance effect for enhancing and improving learning effectiveness and learning instruction performance. Experiential Learning (EL) technique is the process of learning by doing making meaning from direct experience, and is the knowledge, skill, and practice obtained from participation or engagement in an activities [15, 16].

This study researches into the learners’ satisfaction based on different learning instructional designs in the context of educating on traffic rules. There are four different instructional designs and they present the same contents (See Table 1). There are three treatment groups of learning instruction designed in the conceptual framework in this study. First is the traditional instruction approach. It was designed to include narration of text, and pictures delivered with Experiential Learning. Second is the multimedia instruction approach. This approach consists of narration of text, pictures, sounds, and 2D animations delivered with Experiential Learning. And third is the 3D based video instruction approach. Narration of text, pictures, sounds, and 3D videos delivered with Experiential Learning are considered in this approach. The videos are recorded with a 3D camera by recording the real traffic environments
in Thailand followed by the rules selected for this study. There is one additional control group which was designed with the instruction comprising narration of text, and pictures delivered without Experiential Learning. All virtual instructions were designed based on Mayer’s criteria (1997) for multimedia learning systems to help learners to understand lessons [17].

This study employed four constructs from Chiu et al.’s model (2005) which were perceived usefulness, perceived ease of use, perceived value, and perceived system quality to measure user satisfaction [18]. The questions for these four constructs were adopted from Chui et al.’s online learning continuance intention model. The results will be analyzed from five Likert scale and the summary of the mean scores of learner satisfactions will be analyzed using the Independent Sample T-Test.

**Table 1: Proposed conceptual framework for Cognitive Load Reduction**

<table>
<thead>
<tr>
<th>Content Designs</th>
<th>With EL</th>
<th>Without EL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text and Pictures (control group)</td>
<td>Group A</td>
<td></td>
</tr>
<tr>
<td>Text and Pictures</td>
<td>Group B</td>
<td></td>
</tr>
<tr>
<td>Multimedia Instructions</td>
<td>Group C</td>
<td></td>
</tr>
<tr>
<td>3D Based Video Instructions</td>
<td>Group D</td>
<td></td>
</tr>
</tbody>
</table>

### 3. Research Results

All the participant ages range from a minimum of 18 to a maximum of 25 years. SPSS was used to analyze the data. 444 undergraduate students from private universities in Bangkok, Thailand participated and there are 57 questions of satisfying evaluation in this study.

Table 2 reports the results analyzed from five Likert scale and Table 3 presents the summary of the mean scores of learner satisfactions which were analyzed using the Independent Sample T-Test.

**Table 2: Mean score of learner satisfactions**

<table>
<thead>
<tr>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
<th>Group D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>3.30</td>
<td>0.69</td>
<td>4.29</td>
<td>0.75</td>
</tr>
</tbody>
</table>

In order to analyze the mean satisfaction scores for all of the groups, a one way ANOVA approach was used. The p-value of 0.00 shows that there were significantly differences between the satisfaction scores of all experimental groups. And the results showed that the mean scores of group C was the significantly highest on learner’s satisfaction.
Table 3: Learner satisfaction results

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Levene’ s Test for Equality of Variances</th>
<th>t</th>
<th>df</th>
<th>Sig (2-tailed)*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H_0: µ_B = µ_A</td>
<td>1.35</td>
<td>.06</td>
<td>-50.15</td>
<td>.000</td>
</tr>
<tr>
<td>H_1: µ_C = µ_A</td>
<td>1.17</td>
<td>.21</td>
<td>-67.84</td>
<td>.000</td>
</tr>
<tr>
<td>H_2: µ_D = µ_A</td>
<td>1.05</td>
<td>.40</td>
<td>-65.36</td>
<td>.000</td>
</tr>
<tr>
<td>H_3: µ_D = µ_B</td>
<td>1.58</td>
<td>.01</td>
<td>-11.16</td>
<td>.000</td>
</tr>
<tr>
<td>H_4: µ_D = µ_C</td>
<td>1.42</td>
<td>.03</td>
<td>-8.79</td>
<td>.000</td>
</tr>
<tr>
<td>H_5: µ_D = µ_C</td>
<td>1.11</td>
<td>.29</td>
<td>2.76</td>
<td>.006</td>
</tr>
</tbody>
</table>

Level of significance α = 0.05 (5% error)

4. Conclusion and Future Work

This article is an initial work for investigating the effectiveness of Virtual Experiential Learning for cognitive load reduction on educating traffic rules. This article reports an investigation of learners’ satisfaction of four different learning instruction designs. The results showed that learning instruction designed using multimedia instruction approach consists of narration of text, pictures, sounds, and 2D animations delivered with Experiential Learning have the most satisfaction for educating Thai undergraduate students on traffic rules. The next step of this study will investigate the effectiveness and efficiency of various instructional design strategies with Experiential Learning as regard to the effectiveness of supportive cognitive load reduction. Moreover, the relationship between user satisfaction and the tests will be analyzed. This will also contribute towards a better understanding on how to improve the education of traffic rules using Experiential Learning Techniques.

5. References


The Development of Moderate Class More Knowledge Learning Activities

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Abstract

The general objective of this research was aims to developed the moderate class more knowledge learning activities by using school based approaches which have 3 specific purposes: 1) to design the varieties activities for learning management the moderate class more knowledge, 2) to experiment the moderate class more knowledge learning activities, and 3) to evaluate the moderate class more knowledge learning activities. The researcher was followed the 3 research phases: phase 1 was to design the moderate class more knowledge learning activities by school based approaches. This phase operated by Participation or Collaboration or Involvement which allowed the stakeholders cooperated in decision making and management of educational programs by setting the workshop and filed trips so that both of administrators and teachers were haven same encouragement in learning activities design by using constructivist approach and cover 4 elements of educational management: cognitive, ethics education, craft education, and physical education. The learning activities were evaluated the quality by 5 experts. Phase 2 was the experimental stage of the moderate class more knowledge learning activities by implantation into target schools and students which were Wat Nakhang School (113 students), Chumchon Ban Hua Plaung School (121 students), and Ban Tamnob School (124 students). The sample groups were selected by Purposive Selection. The experiment took 2 months in conduction and the evaluation of students’ satisfaction on activities participation by questionnaire with 5 rating scales were handed to students. Phase 3 was the evaluation stage of the moderate class more knowledge learning activities. The evaluation were based on the adapted the evaluation standard criteria of The Joint Committee on Standards for Education Evaluation which researcher constructed the evaluation form in 5 rating scales and followed in 4 criteria: benefits, possibility, approximately, and accuracy by collected from stakeholders who implement the moderate class more knowledge learning activities which were 46 administrators and teachers of 3 schools above.

The research results show that,

1. The outcome of designing the moderate class more knowledge learning activities by school based approach from 3 schools found that, there were different setting of the objective in the development based on the school context. There were also separated into the level of class, operated the activities in individual and group, concentrate on learners
development which teachers spent less time in teaching the core content, however focused on more activities. The evaluation of learning activities were on high quality according to experts’ evaluation.

2. The outcome of experiment of the moderate class more knowledge learning activities shows that, these 3 schools have implemented the moderate class more knowledge learning activities for 2 months and both administers and teachers were assessed the satisfaction of students who participated, and the results show the students have very high satisfied in the moderate class more knowledge learning activities.

3. The outcome of evaluation of the moderate class more knowledge learning activities shows that, the administrators and teachers were participated as stakeholders in the experiment stage and they have knowledge and understanding in the moderate class more knowledge learning activities which developed. They were agreed that the moderate class more knowledge learning activities have appropriated and corrected point of views which could deliver the beneficial outcome for students, and this moderate class more knowledge learning activities will be used to answers all questions about skills developing in students.

Keywords: Moderate Class More Knowledge, Learning Activities,

1. Introduction

“The moderate class more knowledge learning activities” is the vision of education of Thailand which provide students with access to learning in the 21st century. There are consistent with many leading countries in education who concurrently with the concept in the 21st century in the world’s consciousness. The basic knowledge of assembly livelihood, citizen or civic education, health, and the environment. The skills needed in the 21st century skills including learning and innovation, media and technology literacies, work skills, practical life skills (family, school, community, state and nation). The world is changing people with the knowledge and skills to cope with the changes that occur constantly, and can adjust themselves to the new circumstances. The 21st Century skills help students learn and adaptation to the change at any time (Bureau of Academic Affairs and Educational Standard, 2558). However, the result of the synthesis the research on using the core curriculum of the Basic Education 2551 B.E. as well as the quality of education, found that the quality of education of students below both of the results of the national tests (O-NET) examination and results of PISA. Therefore, school take teaching more than seven or eight hours a day and solid academic content rather than the students learn on their own. Students’ workload or homework which they bring to their home cause them stress. Children cannot analysts, lack of life skills and etc. (Bureau of Academic Affairs and Educational Standard, np.).

As mentioned above, the Office of the Basic Education Commission has adopted a policy on the management of time "Moderate Class More Knowledge" into action. Teachers
are changed learning management which focuses on more practice and learn more on their own. Students have been developed to ensure quality and happy to learn truly began to follow the policy of "Moderate Class More Knowledge" in the second semester of academic year 2558, resulting in a school to learn time management and the "Moderate Class More Knowledge" pilot project should be checked or revise into school-based curriculum which use school based approaches. Administration by the school based will focus on the characteristics of each school varies with varieties. The decentralization and participation as a key principles of diversity lead to modern management theory of Hackman and Walton, and Katz and Kahn), and Hoy and Miskel who believe that the school will achieve in several ways and management should be flexible. The school has self-administration in a realistic situation by power distribution and integration of power. The management principles are entirely different. Decentralization is a key mechanism for the reform of the management system for modern primary school. The school administration and teaching is delayed and often have problems directly to solutions that make efficient and timely manner. It is also optimized to solve the problem themselves with the right methods to accomplish their activities and make teaching more effective (Boonprasert, 2544).

For the reasons which mentioned above, it should provide for the development of learning activities "Moderate Class More Knowledge" by adding clear missions which belong to schools’ context and more appropriate. The researcher was interested in developing learning activities "Moderate Class More Knowledge" to give schools the ability to manage their time. Event appropriately teachers are modified forms of learning that focuses on student performance for example, learn more by self, and students get the full development potential of interests with aptitude of the mind happy to learn it. "Moderate Class More Knowledge" probably not new for the learning management at the present because many schools already performed. However, there were also involved school administrators, teachers, students, and parents which they are wondering why the need of "Moderate Class More Knowledge" has to study in this point. We are determined to find it, and found that, nowadays, the learning of the students have changed due to the supply of learning materials and technologies such as Internet, Computer, Tablet or Smart Phone and many more that students can use to learn on their own. Learning are not necessarily limited to the classroom. Students can learn anywhere and anytime both in the classroom and outside the classroom, based on their availability. The ability of students which teachers need to learn how to manage and students must change their way of learning. Learning by focusing on the learners with diverse ways of learning, such as using the groups (Group Process), using project-based learning (Project-Base Learning) to learn from practical to implementation. From direct experience by use questions to stimulate students’ critical thinking and information retrieval. Students are learning skills for life and can be applied in real life, there will be activities for all students to learn together. It will change the role of the teacher as a facilitator, as a consultant to help guide students to success.
Students learn from a team or a group of friends more. Hence, learning this way, students learn happily under the concepts which mention as follow (Bureau of academic and educational standards, 2558, page 1).

1. Alternative activities serve the interests of the dominant students.
2. Learning the principles lead knowledge creation processes and activities (Process and Content).
3. Practicing and knowledge creation in a warm, safe and independent environment.
4. Changing the role of a teacher from teach to coach, mentor and guiding (Coach & Mentor).
5. Teachers should use a variety of evaluation methods such an authentic assessment, analysis and development of students rather than an assessment of the student only.

So "Moderate Class More Knowledge", teachers need time to teach content and need to encourage students to learn more. Teachers should encourage students to construct knowledge by themselves. The role of the teacher should change to teach less. However, the increasing role of the teachers is to have the planning and design activities for teaching preparation of media sources, and prepare questions that encourage students to learn on their own. The concept of using the school based is that has been influenced by the changing world of business and industry. The success of this principles were methods and strategies to make the organization more efficient and productive such a success is that made public and those are involved and agree that the quality of education is better. (Boonprasert, 2544). Upon the cause of the confidence, it shows that the administration by the school based will make the administration more efficient and effective management than the past.

**Research Framework**

The “Moderate Class More Knowledge” policy provide students with access to learning in the 21st century which included basic knowledge, assembly livelihood, citizen, health, and the environment. The skills needed in the 21st century skills, including learning and innovation, Media and Technology Skills, Work Skills, Life skills, which will allow students to learn and adaptation to change at any time. In addition, the development of learning activities should be consistent with the context of the school. Teachers are modified forms of learning that focuses on student performance. Letting students learn more by themselves and students get the full development potential of interest, aptitude, and feel happy to truly learn based on the theoretical learning of constructivist, the researcher determined the conceptual framework of the research as follows.
Research Objectives

This research has a purpose. To develop learning activities, reducing the time to add time to the school as a base. The only purpose

1. To design a variety of activities for learning activities "reduced time to time to study."
2. To try learning activities "reduced time to time to study."
3. To evaluate the learning activity "reduces the time to increase the time to know."

2. Research Methodology

The researcher was followed the 3 research phases: phase 1 was to design the moderate class more knowledge learning activities by school based approaches. This phase operated by Participation or Collaboration or Involvement which allowed the stakeholders cooperated in decision making and management of educational programs by setting the workshop and filed trips so that both of administrators and teachers were haven same encouragement in learning activities design by using constructivist approach and cover 4 elements of educational management: cognitive, ethics education, craft education, and physical education. The learning activities were evaluated the quality by 5 experts. Phase 2 was the experimental stage of the moderate class more knowledge learning activities by implantation into target schools and students which were Wat Nakhang School (113 students), Chumchon Ban Hua Plaung School (121 students), and Ban Tamnob School (124 students). The sample groups were selected by Purposive Selection.

The sample groups were selected by Purposive Selection. The experiment took 2 months in conduction and the evaluation of students’ satisfaction on activities participation by questionnaire with 5 rating scales were handed to students. Phase 3 was the evaluation.
stage of the moderate class more knowledge learning activities. The evaluation were based on the adapted the evaluation standard criteria of The Joint Committee on Standards for Education Evaluation which researcher constructed the evaluation form in 5 rating scales and followed in 4 criteria: benefits, possibility, approximately, and accuracy by collected from stakeholders who implement the moderate class more knowledge learning activities which were 46 administrators and teachers of 3 schools above.

3. Results

The research results show that,

1. The outcome of designing the moderate class more knowledge learning activities by school based approach from 3 schools found that, there were different setting of the objective in the development based on the school context. There were also separated into the level of class, operated the activities in individual and group, concentrate on learners development which teachers spent less time in teaching the core content, however focused on more activities. The evaluation of learning activities were on high quality according to experts’ evaluation.

2. The outcome of experiment of the moderate class more knowledge learning activities shows that, these 3 schools have implemented the moderate class more knowledge learning activities for 2 months and both administrators and teachers were assessed the satisfaction of students who participated, and the results show the students have very high satisfied in the moderate class more knowledge learning activities.

3. The outcome of evaluation of the moderate class more knowledge learning activities shows that, the administrators and teachers were participated as stakeholders in the experiment stage and they have knowledge and understanding in the moderate class more knowledge learning activities which developed. They were agreed that the moderate class more knowledge learning activities have appropriated and corrected point of views which could deliver the beneficial outcome for students, and this moderate class more knowledge learning activities will be used to answers all questions about skills developing in students.

Discussions

The results can be summarized in the following discussion.

1. Designing the moderate class more knowledge learning activities by school based approach for three schools It was depending on the school context which is very important in learning activities planned. The focus is on learning, teachers take teaching materials for less time for students to learn more. As a result, experts’ opinion shows that the learning activities which school has developed were at a high level. This may be due to the fact that there is the beginning of knowledge, understanding policy of the activities and practices "Moderate Class More Knowledge" according to synchronize the workshop and study. The stakeholders include administrators, teachers, parents and students. The analysis course
context for the design of learning activities by using schools based management which focus on the characteristics of each school. The principle participated and let teachers more freedom to do the learning activities which based on the theory of return power to people (Boonprasert, 2544). The enrichment of activities and learning to enhance the features and values, life skills and covers four main elements of the study include cognitive and physical education, moral education handicraft education. (The Ministry of Education, 2553) are also in the concept of learning Teach Less Learn More. Teachers should encourage and facilitate the learning management continued (Aungkanapatkajon, 2554).

2. The outcome of experiment of the moderate class more knowledge learning activities shows that, these 3 schools have implemented the moderate class more knowledge learning activities for 2 months and both administers and teachers were assessed the satisfaction of students who participated, and the results show the students have very high satisfied in the moderate class more knowledge learning activities. These may be because students learn by their interesting and fulfill their learning by investigated and conducted their learning which related to the report of the Ministry of Education (2553), showed that if students learned by their interesting they will gain more knowledge and feel happy to learn. Moreover, Chaikot (2554) and Sripramarn (2553) also found that the learning activities which related to the practice such as building some handmade, craft, and self-learning will encourage student learning outcome and their feeling and attitudes.

3. The outcome of evaluation of the moderate class more knowledge learning activities shows that, the administrators and teachers were participated as stakeholders in the experiment stage and they have knowledge and understanding in the moderate class more knowledge learning activities which developed. They were agreed that the moderate class more knowledge learning activities have appropriated and corrected point of views which could deliver the beneficial outcome for students, and this moderate class more knowledge learning activities will be used to answers all questions about skills developing in students. These results show that researcher worked closely with stakeholders and followed the research step and framework. The workshop was run for encourage stakeholders' knowledge and understanding about "Moderate Class More Knowledge" policy and lead to adapted into schools in form of learning activities based on school context and school based approach. During the research, researcher has followed up and support in each steps in design and develop learning activities.

4. Recommendations
Suggestions for implementation.

Based on the findings, “Moderate Class More Knowledge” learning activities were appropriated, accreted and useful, so researcher has suggested in implementation as follows,
1. The school must organize learning activities of "Moderate Class More Knowledge" can lead the learning activities into schools by developed to the conditions that match to school context which will implement more efficiently.

2. Each school should have a policy on the implementation of "Moderate Class More Knowledge" clearly in implementation this learning activities.

Suggestions for future research, researcher has suggested in the future research which is to research on evaluation the students’ characteristics from "Moderate Class More Knowledge", and to research the impact that may occur from implementing the learning activities of "Moderate Class More Knowledge". These findings will be take into the consideration of improve the implementation in the most effectively way.

5. References


Service Infrastructure Digital Economy to Smart Thailand 2020

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Abstract
Economic and social use information technology and communications. That was the era of Digital Economy. Is an important mechanism to drive the reform Business services, trade, education, health and Social Economy activities that affect economic development. Improving the quality of life in society and employment increased. For services to economic development and social development to enhance the capabilities of the digital sector Thailand to contact the potential to communicate over the Internet instead of the traditional way of working. The number of employed in Small and Medium Enterprise (SME) with plenty of labor productivity but also significantly lower than competing countries. Thus, system integration center volume data to enhance SME and software development support of business for SME to provide information, knowledge and advice to business right. SME and unified support system for entrepreneurs to leverage the potential and increase the competitiveness of integrated, proactive.

Keywords: Digital Economy, Service Infrastructure, Small and Medium Enterprise, Social Economy

1. Introduction
The agriculture in Thailand is highly competitive. Agriculture used to be an engine of economic growth. Agricultural production such as rice, Para rubber, oil palm and crop. Currently, Agricultural prices remain low. That was purchased by the country’s overall slowdown. In June 1-21, 2015, the number of foreign tourists traveling to Thailand grew by 1.56 Million People, a high level of 53.6 percent per year, reflecting the strong growth of the tourism sector abroad (Krisada, 2014) The problem of Marketing, product development, developing the right marketing strategy, marketing promotion, and use of marketing research as a marketing tool. Thus, this problem affects their marketing management, organization development, information management, and so on, which makes them abortive. The researcher have a concept that should be a technology called the Electronic Commerce (E-
Commerce) on Mobile technologies can provide the better competitive advantage by establishing the entrepreneurs network. In support of promoting the expansion of markets both domestically and abroad. E-Commerce is commercial transactions over electronic media in any way, such as electronic goods and services. The faster growing of technology, Mobile-Commerce (M-Commerce), which is based on E-Commerce simply rebranded the technology. The former is based on the computer. The device is easy to use that is small, delicate, beautiful Portable and fast access to the Internet. That is enabling customers and users satisfaction. Causing for employment income citizens and increase the growth rate of the GDP of Thailand. (Hathairat Thiabsang et.al. 2015)

Economic and social use information technology and communications. That was the era of Digital Economy. Is an important mechanism to drive the reform Business services, trade, education, health and Social Economy activities that affect economic development. Improving the quality of life in society and employment increased. For services to economic development and social development to enhance the capabilities of the digital sector Thailand to contact the potential to communicate over the Internet instead of the traditional way of working. The number of employed in Small and Medium Enterprise (SME) with plenty of labor productivity but also significantly lower than competing countries. Thus, a system integration center volume data to enhance SME (SME Information Portal) and software development support of business for SME (Software as a Service for SME) to provide information, knowledge and advice to business right. SME and unified support system for entrepreneurs to leverage the potential and increase the competitiveness of integrated, proactive. That promote the growth of agriculture, manufacturing and services, especially the ASEAN Economic Community significance of moving goods and people from Thailand to ASEAN and competitive in the global market.

2. Computational details
In February 1996, the first National IT Policy, called IT2000, was announced by the NITC and endorsed by the Cabinet. IT2000 put forward the vision for the country to properly exploit IT to achieve economic prosperity and social equity. To this end, the policy emphasized three common development agendas, i.e., (1.) to build an equitable national information infrastructure (NII), (2.) to invest in people to accelerate the supply of IT manpower and to develop an IT-literate workforce, and (3.) to achieve good governance through the use of IT in delivering public services and in government administration. In bringing such policy to implementation, each government agency developed its own master plan to correspond with the direction set forth in IT2000. (Chadamas Thuvasethakul. et.al. 2002)

What have been achieved under IT2000 (Chadamas Thuvasethakul. et.al. 2002)
From the basis of framework and recommendations put forward in IT2000, many programs and/or projects has been initiated by various government agencies, including
NECTEC, under its capacity as NITC secretariat and as a national R&D center. To name a few of those initiatives, they are:

1. National Internet Exchange Points, where all domestic Internet traffic get exchanged without going out of the country;
2. SchoolNet Thailand, a national school informatization program to empower all schools to access a large pool of information resources using the Internet;
3. Government Information Network (GINet), a government backbone network to facilitate intra- and inter-agencies communication and information exchanges;
4. Development of legal infrastructure by introducing new laws to support the application of ICT in the country.

If country-driven economy based on the digital economy and economic activities will be the same format as the original Digital Economy have all or not. Order a product that did not exist. Intangible, such as the purchase of computer software, music. App, the Action Mobile. Or photos including online books these products are called Digital or digital productions Goode. The product is a digital only or digital productions Goode only delivered via the Internet. Traditional economic activity to shift to a digital Economy infrastructures. It depends on the nature and condition of the economic activity. Can be either direct, indirect, such as the use of technology to help manage production. Collection of freight Clothes manufacturers to embed tiny chip. In clothes the chip will contain information that the clothing is produced, where, when, who is the producer. Import Export at any When available And a buyer at any price, how much information will be beneficial to all parties involved, including manufacturers, retailers, logistics suppliers. Including customers who need replacement.

States have enacted laws Electronic Transactions Act 2544 into force in 2544 to support the legal status of electronic data. Always with a book or evidence in writing As well as to hear the testimony of the electronic information has resulted in legal transactions, as well as the common way. To encourage the use of electronic transactions instead of the original system which can facilitate faster than the old system. (Sakon Harnsuthivarin. 2014)

3. Results and discussions

Digital Economy is an economy with all economic activities including transactions starting from Upstream, Midstream. This transitional period to Digital Economy for Thailand is rather a big challenge for the country. Economic and social use of information and communications technology. That was the era of digital economy and society. Is an important mechanism to drive the reform process? Business services, trade, education, health and socio-economic activities that affect economic development. Improving the quality of life in society and employment increased. (Ministry of Information and Communication. 2016), the government has realized the importance of the digital economy, focusing on the production
and trading of digital products. As well as the use of digital manufacturing and support economic development. By bringing digital into a tool to drive enterprises, especially the SMEs, which are still not able to bring information and communications technology, or ICT use in business. Due to lack of knowledge, understanding and skills in the use of ICT in the development of industrial enterprises under the framework. A digital SMEs (Digital SMEs) (Department of Industrial Promotion. 2016)

To promote the industry's new show concepts. “The digital SMEs (Digital SMEs)” to implement Digital Economy through five programs: 1. New Entrepreneurs Digital (New Digital Entrepreneur) 2. SMEs Intelligence (Intelligence SMEs) 3. Digital for the enterprise. Community (Digital OTOP) 4. Social learning with digital (digital knowledge society) and 5. Business Advisory cyberspace (cyber Service Provider) by promoting entrepreneurship development in digital technology will foster the establishment. (Startup) of a new generation of digital entrepreneurs to support the digital economy and will benefit the operator in terms of management. Increasing production efficiency, reduce cost of operations. Marketing to reach consumers has widened, etc. The aim of such plan to the five pilot group of SMEs in the country with over 2.76 million with adjusted budget of 100.45 million baht (Department of Industrial Promotion. 2016). To develop economic and social development to enhance the capabilities of the digital sector in Thailand to contact the potential to communicate over the Internet instead of the traditional way of working. (Digitalization), the number of employed in Small and Medium Enterprises (SME) with plenty of labor productivity but also significantly lower than competing countries. Thus, a system integration center volume data to enhance SME (SME Information Portal) and software development support of business for SME (Software as a Service for SME) to provide information, knowledge and advice to business right. SME and unified support

Figure 1 Digital landscape in Thailand for 20 years.
(Ministry of Information and Communication Technology. 2016)
system for entrepreneurs to leverage the potential and increase the competitiveness of integrated, proactive. To promote the growth of agriculture, manufacturing and services, especially the ASEAN Economic Community significance of moving goods and people from Thailand to ASEAN and competitive in the global market.

A digital SMEs (Digital SMEs) by adjusting the various project activities. To suit the digital economy as the top five.

1. To create a new operator Digital (New Digital Entrepreneur) is to educate, to prepare the operator such as IT business group Author Application. And games on the Smartphone or freelance work. Animation / Graphic Design services to start and run a business. The goal is 500 people, including a fine course. "New Entrepreneurs Creation Project" (NEC) to course content up to date and comprehensive knowledge of IT to a more targeted 1000 people.

2. SM's genius. (Intelligence SMEs) are adopting IT to increase efficiency and productivity of SMEs. Using the Enterprise Resource Planning system, or ERP, to manage all aspects of Supply Chain Management and stock. Increasing market potential via the internet and social networks. As well as donating funds to hire a consultant to improve the business by using digital technology to enhance a target total of 480 operations.

3. The Community Enterprise Digital (Digital OTOP) by encouraging manufacturers OTOP products with the potential to market with digital media and online media. Through training and counseling on the use of online media to create ecommerce site form. And social media to target the group heal the wisdom that has the potential to enter the international market to offer culturally. Identity and wisdom Adopt creative design and product introduction in at least 70 products.

4. Social Construction of digital learning (Digital Knowledge Society) is a network of SMEs interest and knowledge in the IT and the business by leveraging digital media business through the exchange of knowledge between. Together Training courses and seminars like "Digital Marketing Futuristic Marketing" and. "New online course that prevail" With the goal of network operators in 1000.

5. Development of the Business Advisory cyberspace (Cyber Service Provider) to develop a business advisory group of 60 experts in the business in the online world. The content of the training focused on the application of the system. ERP, e-commerce online marketing and social media advisor who participate will learn both the theory and practice by providing consulting advice to SMEs.

Somchai Lertsutiwong CEO Plc. Advanced Info Service (AIS), said those in the telecommunications industry have benefited from this policy. It requires efficient infrastructure. And mobile networks is one of the cogs that drive the action to be sustainable. If it comes to the best technology in the 4G LTE wireless ultrasound transmit data up to 5 times faster than 3G, making the state, and private individuals to send information to each other better.
Supachai Chearavanont the President. And Chairman of the Executive. True added that the telecommunications industry is a vital cog in helping the government push forward the digital economy. He encouraged the industry more efficient. It is to be seen this year. The 900 and 1800 MHz spectrum auction will be the first step. This is evident from the use of network infrastructure sharing to help others. (Prachachat online. 2015)

4. Conclusion

The plan has been prepared to promote Small and Medium Enterprises, No. 3 (2555-2016) to serve as a guideline for the development and promotion of Small and Medium Enterprises of Thailand to continue growing. Sustainable and competitiveness in the context of the changing world. Small and Medium Enterprises Promotion Plan No. 3 (2555-2016), a conceptual framework. The push for Small and Medium Enterprises are the main driving force of the economy, Thailand. By giving priority to. Development of Small and Medium Enterprises to conduct business using knowledge, creativity, innovation. And cultural identity in the field of business and entrepreneurship. And head supported by the growth of the business, including the business started (Start-up) means business with a duration of business not more than three years, the growth stage (Growth & Maturity) and the adjustment Change. Business (Turn around), which will cover the spatial dimensions of the overall domestic provinces and province. To comply with the policies of the central spread prosperity to the region. And Spatial Development Strategy

Focuses on the promotion. Development of Small and Medium Enterprises for balanced and sustainable growth by strengthening competitiveness. Competitiveness in terms of quality, efficiency, creativity and innovation. To Small and Medium Enterprises and small enterprises. Encourage the integration and coherence of business. Developing spatial taking into consideration the social, cultural and environmental factors unique to each area. In the field of capacity building Preparing for the economic integration and liberalization are focused support infrastructure and. To create an environment conducive to international trade and business. The conditions for the success of the plan. Small and Medium Enterprises Promotion No. 3 also depends on the continuation of government support and the availability of potential Small and Medium Enterprises. As well as changes May affect certain times.

The goal of the strategy required to reflect the results of operations of the agency and consistency. Policies to promote Small and Medium Enterprises. Which plans to promote Small and Medium Enterprises No. 3 (2555-2016) has set a goal of promotion. Based on current data, combined with the results. Promoting ago and forecasts of economic trends on five aspects.

1. Small and Medium Enterprises are registered legal entities increased and cannot operate. Continuous and lasting no less than 250,000 enterprises by the year 2016.
2. Small and Medium Enterprises in the target group has been developing capabilities.
Competition in the depth of not less than 30,000 by the year 2016.

3. Clusters of Small and Medium Enterprises have been developing a strong network of more than 60 enterprises per year.

4. Environmental factors in the operation have been developed to reduce barriers and improve. Facilitating ease of operation of Small and Medium Enterprises more.


6. References


The Development of Learning Process as “Civic Education with Philosophy of Sufficiency economy” in People Part for Build Happiness’ Thai Society

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Abstract

The purpose of this research was to develop learning process as “Civic education with Philosophy of sufficiency economy” in people part for builds happiness Thai society. Experimental Development Research for the learning process was to create Civic education with Philosophy of sufficiency economy and the result of learning process to create Civic education with Philosophy of sufficiency economy. Sampling were Scholars in the Social Sciences, Curriculum and Learning Management and the target area of 20 people, experts in Social Sciences and Learning Management of 3 members and community residents, Tambon Don Kloi Amphoe NongKhayang, Uthai Thani Province and Tambon Taluk Du Amphoe Thap Than Uthai Thani Province, Purposive random sampling of 30 total. Was applied Research Tools were Assessment Guidelines for the development of the learning process and queries about the attributes of citizenship under the philosophy of people sector. And finding were as follows:

1. Socialization was to person to be responsibility and participation in community activities, social integration among the virtues of citizenship common feature of citizenship based Philosophy of Sufficiency Economy. The focus was to create consciousness through the process of learning the basic needs of the community, to define the problem, and to development activities into action to achieve goals. And the evaluation found that the learning process was effective at a high level.

2. The learning process “The civic education the philosophy of sufficiency economy ”sector to enhance the well-being of society, Thailand found that the average characteristics of the population, according to the Philosophy of Sufficiency Economy the people, by the learning process after the experimental the higher difference was statistical significance at the level of 0.05.

Keywords: Learning process, Civic Education, Philosophy of Sufficiency Economy, Well-Being

1. Introduction

Background and importance of the issue

The concept of civil society has happened and is happening in Thailand is the concept of the social movement, new forms (New Social Movement) are varied and different. And the concept of civil society is independent of Thailand is dominated by the state. Despite the assistance and cooperation of the state. But also directed and the state has a reasonable objection. Meanwhile, it is
not a society that stresses individualism exemplified. But a society that encourages individuals to come together. Collective responsibility, Do not deny or seek to protect their interests only (Anek Laothamatas, 2007; Cited in Anuchat Poungsomlee and Kritaya Archavanitku, 1999) as a citizen with political power, the realization of the ideals of democracy, Rights and duties, Equality, freedom, public interests. And through focused efforts to create good things for the local community and lead civil society to participate in the direction of the state. Or on behalf of the state to solve the problems of the public.

The aim of the concept of civic society Thailand, focus on Democratic citizenship the nature of citizenship; Civic characters (Charles, 2015, online; Davies, Gregory and Riley,, 1999: 44-48; Fenton, 1967: 25) as 3 reasons are; Civic Knowledge, Civic skill and Civic virtue. Basically, the knowledge and skills that are citizens can be developed and taught within the classroom curriculum. While the virtues of citizenship is an abstract. Cannot teach or educate the classroom. Having learned from experience in practical activities. Education or learning citizenship to all three. In particular, the virtues of citizenship that allows people to participate in various activities. In addition, Surawut Pudthaisong(1999) noted in. Learning to citizenship: tap root of the process of building civil society. That the cause of education in the regular school system under the action of the state cannot make people virtuous citizenship then. May have caused "The power of a unified Thailand. Focus on Security Decentralization, people are less involved. Especially in education Security reasons Logging and manufacturing industries as a modern Western ideologies. The state determines the course and how to manage them unilaterally. To become a barrier to education for citizenship and cannot cause a society of learning. Citizenship that was so full of knowledge and skills. However, a lack of moral goodness of citizens in enhancing the social and political system, however, a good education to meet the globalization, capitalism cause allergic competition copy. Create a selfish viewpoint, exploitation and partisan. As the most highly educated. A lack of interest in social distress of fellow. Most communities were affected, loss of community solidarity. Living separately Lack of cooperation with each other. The community has high external dependence. Have low bargaining power the problem usurpation and destruction of resources, debt problems, and social problems occur. The community itself has been difficult to control and patch management. The lack of community foundations and development (Uthai Dulyakasem and Orasri Ghamvitayakom, 1997: 2) potential abandonment, lack of local knowledge and continuous improvement.

And the importance of such issues. Researchers have developed a learning process. "Civic education of the philosophy of sufficiency economy" public sector in order to develop the process of learning citizenship based on the sufficiency economy philosophy public sector at all levels with the middle path to enhance the well-being of society, Thailand

Research Objectives

To development learning process "Civic education of the philosophy of sufficiency economy" as public sector, to strengthen the well-being of society, Thailand
Concepts and theories

The concept of citizenship has its roots in participation and desire for Autonomy (Dalton, 2008: 78-19; Faulks, 2000: 13; Thompson, 1970: 25) as the basic right of being human freedom and participation in political power as a full membership and the community (Marshall, 2002: 8-9) as Keith, Blake, and Tiedt (1968: 188.-195) and Anek Laothamatas (2007: 17-18) called a "good citizen" of honor, dignity, social equality with others. Are proud of their citizenship (Turner, 2001: 192) learning process for creating features citizenship. The aim is to develop the learning community consists of content, means-ends. (Srilapong Nakornthap, 1996:61-64; Surawut Pudthaisong, 1999 : 107-113) because learning is at the heart of creating a public person or a citizen of the community have access to a well-rounded understanding of morality and conscience and citizenship. Self-reliant (Sumet Tantivejakul, 1998: 62) However, the learning process for citizenship must comply with the lifestyle of people in the community who have ties reliance on natural resources and live subsistence (Montree Yamkasikorn, 2005: 42-48) the goal is to educate for life and expertise in the profession with moral values, beliefs and conscience, which is the foundation of the behavior classy way. Learning the different characteristics and variable nature of learning.

Concept of Sufficiency Economy said that the philosophy of living in harmony with nature and the possibility of social thinker as Sumet Tantivejakul (1998: 62) have expanded their economic self-sufficiency that means the ability of communities of the state. Country or region to produce and social services of all kinds to feed them. By avoiding the need to rely on other factors that we do not own.

The concept of well-being. That should be a goal of every society. And a continuous process as lively without a single destination. But to focus on all aspects of life. Indicating the points that are needed to be updated. Propose ways to help individuals improve their health. And the level of well-being depends (Hales, 1994: 3-6) It covers two elements (Buapun Promphakping, 2006. Cited in Pattaraporin Sri Brahma, 2009: 21-22), including the well-being of the empirical (Objective Well-being-OWB) and the subjective well-being (Subjective Well-being-SWB).

Concepts and theories above the researchers used as a framework to conduct research. To develop the learning process of "civic education of the philosophy of sufficiency economy" public sector, to strengthen the well-being of society, Thailand. Are as follows:

Conceptual framework

<table>
<thead>
<tr>
<th>Theories</th>
<th>Process</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The concept of citizenship.</td>
<td>Guidelines for the learning process for the feature. - Learn the basic context - Jointly define issues - Development activities to practice - Compliance goals - Diagnosis and Evaluation Summary</td>
<td>The development of process learning as civic education with the philosophy of sufficiency economy as the people to enhance the social well-being of society, Thailand.</td>
</tr>
<tr>
<td>2. The concept of learning features to citizenship.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. The concept of sufficiency economy.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. The concept of well-being.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1 Conceptual framework.
2. Methodology

Research on the development of the learning process. "Civic education of the philosophy of sufficiency economy" as public sector to enhance the well-being of Thai society. As Experimental Development, which is the process of doing research is divided into two phases.

**Phase I** to study the process of learning to citizenship along philosophy of sufficiency economy as public sector to enhance the well-being of Thai society.

Population and sample. The population in this study were 1) qualified in social sciences. Luminaries of the course and learning management. People in the target area. The agencies involved in the area and at the provincial level and 2) specialist in social sciences and professional learning. The sample used in this research are: 1) qualified in social sciences. Luminaries of the course and learning management. People in the target area. The agencies involved in the area and in the province. The selection of Purposive Sampling, 20. 2) specialist in social sciences and professional learning. Which is derived from a select sampling of 3 people. Data collection consisted of 1) the design of the learning process by meeting Workshop highly qualified. To establish a learning process for citizenship along philosophy of sufficiency economy as public sector to enhance the well-being of society, Thailand 2) performance evaluation, the introduction of guidelines for the learning process to create a citizenship along philosophy of sufficiency economy as public sector to strengthen the well-being of society, Thailand. Data analysis, The researcher analyzed data The qualitative data. Using content analysis and quantitative data. Using statistical analysis as the average and standard deviation.

**Phase II** to development process learning. "Civic education of the philosophy of sufficiency economy" as public sector to enhance the well-being of society, Thailand. The learning process for citizenship based on the philosophy of sufficiency economy.

Population and sample. The population in this research include the public in the target areas include 1) Community of Tambon Don Kloi Amphoe Nong Khayang , Uthai Thani Province and 2) Community Of Tambon Taluk Du Amphoe Thap Than Uthai Thani Province. The sample used in this research include community residents in targeted areas include 1) Community of Tambon Don Kloi Amphoe Nong Khayang , Uthai Thani Province and 2) Community of Tambon Taluk Du Amphoe Thap Than Uthai Thani Province, 30 of which were purposively selected. The tools used to collect data in this survey include information on features for the social well-being of citizens. The philosophy of Sufficiency Economy for citizens. Data collection Approach the learning process to citizenship along sufficiency public sector to strengthen the well-being of society as Thailand, the researchers have developed to try to sample. The study was conducted for a period of four months using conventional research group pre-post - test (One-group pretest posttest design).

<table>
<thead>
<tr>
<th>Pretest</th>
<th>Treatment</th>
<th>Post test</th>
</tr>
</thead>
<tbody>
<tr>
<td>O₁</td>
<td>X</td>
<td>O₂</td>
</tr>
</tbody>
</table>

Data analysis, the researcher analyzed data the qualitative data using content analysis and quantitative data using statistical analysis the average standard deviation And test the difference between the averages of the samples are not independent of each other.
3. Results

1. The process of learning to citizenship along philosophy of sufficiency economy as public sector to enhance the well-being of Thai society found that the design of the learning process by a workshop of experts to formulate guidelines. Learning process \textit{“Civic education of the philosophy of sufficiency economy”} as public sector to enhance the well-being of Thai society has made the concept/principle of form with the basic idea to create a feature of citizenship (Civic. Characters) that are characteristic of the integration link between moral citizenship in general (Civic Virtue) features citizenship under the sufficiency economy philosophy. That brings it to life in a family. Community and society contribute to sustainable development. A key goal is to create consciousness. Finally, it is of fundamental importance modest savings and a commitment to greater self-reliance to achieve a better quality of life for people in the community; however, the socialization of characteristic a learning process, citizens must process of learning in the community. Emphasize fraternal relations system and to help the mutual dependence of the community. Sharing knowledge and experiences between community members and outsiders live, and how various media. By integrating into the lifestyle of normal people in the community to learn from practice and learning about life, not separate from society, so the learning of the community by the community. As a key concept of the learning process together. And are thinking of bringing peace to a sustainable community. The aim of the scheme is to socialization people to learn a sense of responsibility and participation in the activities of the community by individuals to learn together. Sharing ideas and practical solutions that together. On issues of individual and collective. And the awareness to the community and society as a whole. To become a more permanent character. This will lead to a sense of being a good citizen of society together. Pattern / learning process consists of 1) the educational context / background information. And the needs of the community, 2) define common problems on a personal level or in a group or community, 3) develop activities to put into practice. The process of planning (Action Plan) 4) practical steps to achieve 5) the diagnosis, evaluation and conclusion. Facilitator as encourage learning: 1) encourage community discussion. Exchange of experience, mutual learning, 2) encourage community awareness public. The opportunity for community activities together with the goal to benefit the community and society. Community role: 1) Community activities, workshops, real learning together.2) determine the learning activities together. And self-evaluation to improve. The atmosphere / environment: 1) an open atmosphere for students to comment on the full 2) environment and provide learners with the public interest to do so common. Measurement and evaluation of learning: 1) the principle of goodwill assessment. - For all parties involved in the assessment, 2) focus on community self-assessment 3) focused on behavioral assessment practice. And character is important 4) evaluating the progress and evaluate results 5) use of authentic assessment. Application management approach to learning. Deploy or integrate the activities performed in daily life. However, the evaluation found that the approach to the learning process for citizenship based on the sufficiency economy philosophy public sector to strengthen the well-being of Thai society. Performing at a high level (x= 4.42).
2. The development of the learning process. "Civic education of the philosophy of sufficiency economy" as Public sector to enhance the well-being of Thai society. The learning process for citizenship based on the sufficiency economy philosophy results appearing in Table 1.

Table 1 compares the average of characteristics of citizen, the philosophy of sufficiency economy for as social well-being of the people who approach the learning process for citizenship based on the sufficiency economy philosophy to strengthen the well-being of Thai society.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>X</td>
<td>S.D.</td>
<td>N</td>
</tr>
<tr>
<td>Diligence and patience</td>
<td>30</td>
<td>3.22</td>
<td>0.64</td>
<td>30</td>
</tr>
<tr>
<td>Discipline</td>
<td>30</td>
<td>3.24</td>
<td>0.68</td>
<td>30</td>
</tr>
<tr>
<td>to leniency</td>
<td>30</td>
<td>3.39</td>
<td>0.75</td>
<td>30</td>
</tr>
<tr>
<td>Integrity</td>
<td>30</td>
<td>3.35</td>
<td>0.70</td>
<td>30</td>
</tr>
<tr>
<td>Public Mind</td>
<td>30</td>
<td>3.19</td>
<td>0.77</td>
<td>30</td>
</tr>
<tr>
<td>attainments</td>
<td>30</td>
<td>3.26</td>
<td>0.74</td>
<td>30</td>
</tr>
<tr>
<td>Modesty</td>
<td>30</td>
<td>3.05</td>
<td>0.65</td>
<td>30</td>
</tr>
<tr>
<td>Rationality</td>
<td>30</td>
<td>2.98</td>
<td>0.50</td>
<td>30</td>
</tr>
<tr>
<td>Immunity</td>
<td>30</td>
<td>3.36</td>
<td>0.76</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total average</strong></td>
<td><strong>30</strong></td>
<td><strong>3.23</strong></td>
<td><strong>0.65</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

* There is a statistically significant level. 05.

Table 1 shows that the average characteristic of citizenship for as social well-being. Along the sufficiency of the people who approach the learning process for citizenship under the philosophy of sufficiency economy, to enhance the well-being of Thai society. Overall, the highest level (x= 3.52), with the difference to the average characteristics of citizenship for social well-being along the philosophy of the people as a whole at a high level (x= 3.23), respectively. Statistically significant at the .05 level. And considering that the average item characteristics of citizenship for social well-being. Along the sufficiency of the people who approach the learning process for citizenship based on the sufficiency economy philosophy as public sector to strengthen the well-being of all trial after Thailand with a difference. The attributes of citizenship for social well-being. Along the sufficiency of the trial before a statistically significant level. 05.

**Discussing the findings.**

Research The development of the learning process as "Civic Education of the philosophy of sufficiency economy" as public sector to enhance the well-being of Thai society is divided into two parts together.

1. The process of learning to citizenship along philosophy of sufficiency economy as public sector to enhance the well-being of Thai society. Can confirm that Guidelines for the learning process to citizenship along sufficiency as public sector to enhance the well-being of Thai society. It is based on the concept and the theory of learning communities. Perhaps the key principles of a learning community is a learning process and broadcast community. How is the community learning and
exchange between community members and outsiders live, and how the various media (Srilapong Nakornthap, 1996: 61-64; Montree Yamkasikorn, 2005: 42-48; Orasri Ghamvitayakom, 2006: 40-44; Anurak Panyanuwat, 2005: 187-191) the learning community. Therefore influencing the development of the social solidarity. At the same time, each person can develop life and livelihood problems of their own. This promotes a culture of learning, engagement and relationship between humans as well. Consistent with the findings related to the learning process of the community can make a strong community must be key elements: 1) people in the community, 2) intellectual community, 3) learning activities, 4) have a common goal and 5) Management. And the same time, Supot Sang-nguern (2003) who studied the learning process of community development with a strong sense of community, a community that caters to the learning community members to develop a personal quality. The basic factor that contributes to the learning process, five main consciousnesses within the community. Demand fundamentals to life. Driven by community leaders. Networking Community and coordination with government agencies. For the learning process in learning through work projects or activities that do not come under the concept “think about the present. Up the future, this combines. The conventional wisdom of the community to incorporate new knowledge coming from outside the community and contributes to the learning process to develop a strong sense of community.

2. The development of the learning process. “Civic education of the philosophy of sufficiency economy”. As Public sector to enhance the well-being of Thai society. The learning process for citizenship along the philosophy that the attributes of citizenship based on the sufficiency economy philosophy as public by organizing the learning process. Before and after every trial is different. Statistically significant at the .05 level. This is because. Learning process based on the concept of this research is to design a learning process based on the theory that learning communities. Learning communities need to have a forum to exchange knowledge and continuous learning to understand the reality of the daily routine. It is a group process, Learning together The real action From real-life problems and to learn and work together in a network (Srilapong Nakornthap, 1996: 61-64) by learning this way can enhance the characteristic of citizenship based on the sufficiency economy philosophy. The proposal is consistent with the research of Sangrawee Thiadumr (2007) have studied about. Trust in the public administration, with a population of people in Bangkok found that a variant of citizenship, including the influence of trust in the administration of the people in Bangkok. This research deals with the government policy to strengthen citizenship to the people of Thailand. By educating and develop attitudes and values of democracy. In particular, the performance of political citizenship. And participation in politics. The basis for the administration, with the participation of Apichart GarrigaKan (1999) about the social and political dimensions that by virtue of their citizenship. A case study of the Pak Phanang, Nakhon Si Thammarat, the moral citizenship. Social and cultural conditions vary. The main conditions that cause moral issue is the joint struggle against the difficulties of making a living from the past as well as fighting on the basis of kinship Confederation stanza. The building groups and discussions on almost every subject. These conditions have caused a social process in which all
morality upheld and respected in society. Created by virtue of their citizenship Thailand. The community has created a social structure that is not a bureaucratic structure.

Policy suggestion

1. Guidelines for the learning process to Civic Education by philosophy of sufficiency economy of the people to enhance well-being of Thai society. Should focus on learning. Understanding the learning authentic. The problem with the facts of daily life in a learning network. This is an approach to learning in the community and the community to learn and contribute to the development of various dimensions of sustainable development so that local communities should be based on a preliminary development plan. Or a key tool in driving the local community more broadly next.

2. The relevant authorities. Institutional development of local communities, Local political institutions, so there, should be guidelines for the learning process to civic education by philosophy of sufficiency economy of the people to enhance well-being of society to use Thailand as a base solution or the development of local communities in various dimensions. Economic, social, political and cultural conflicts today.

3. Develop a characteristic of citizenship with the philosophy of sufficiency economy that may be developed or strengthened since the youth so that they may have beneficial applications for children and youth who are outside the system. Continuing to build up the attributes of citizenship. Therefore, the relevant authorities should find ways to implement youth development further.

Suggestions for further research

1. This research was conducted by led approach to the learning process to citizenship by the philosophy of sufficiency economy as the people to enhance well-being of Thai society. Only some areas and especially the rural society. Therefore, research in the areas of cultural or urban areas as well. To compare the effects of the research in each areas.

2. There should be research-based methodology, advanced quantitative research to study the causes or factors associated with the creation or development of the attributes of citizenship.

3. Navigating the learning process to citizenship by the philosophy of sufficiency economy as the people to enhance well-being of Thai society to study in depth the prospects which are unique to certain groups such as farmers’ groups. Labor and Contractors, Merchants or businessmen. Some groups, including marginalized groups such. The alien’s labor. The people of Thailand, mountains, etc.

4. References


Preparation of Activated Carbon from Sugarcane Bagasse for Application of Methylene Blue Adsorption

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Abstract

In this study, activated carbon was prepared from sugarcane bagasse with H₃PO₄ chemical activation and it was used for methylene blue adsorption in batch process at 30°C. In the experiments, the effects of adsorption such as contact time (5–420 min) and initial dye concentration (50–250 mg/L) were investigated. The Langmuir, Freundlich, Temkin and Dubinin-Radushkevich isotherm models were used to analyze the equilibrium adsorption data. It was found that the equilibrium adsorption data were best fitted by Langmuir isotherm and the maximum adsorption capacity was 476.191 mg/g. For kinetic study, the adsorption data were analyzed using pseudo-first order, pseudo-second order and intraparticle diffusion equations. It was found that the experimental data were fitted well with pseudo-second order and intraparticle diffusion models. The highest correlation coefficient for intraparticle diffusion model proved that the intraparticle diffusion played a significant role for the adsorption of methylene blue onto activated carbon. The adsorption capacity ($q_e$, cal) estimated by intraparticle diffusion model was in accordance with the experimental adsorption capacity ($q_e$, exp). However, the intraparticle diffusion was not the only rate-controlling step of the adsorption process. The result of this study showed that the activated carbon from sugarcane bagasse was effective for removal of methylene blue dye in aqueous solution.

Keywords: activated carbon, sugarcane bagasse, methylene blue, adsorption

1. Introduction

Synthetic dyes are widely used in the textiles, paper, plastic, leather and cosmetic industry to color products. The presence of dyes can cause damage to living beings in water. In addition, the stability of most dye molecules under condition of light, heat and chemicals leads to the fact that the dying effluents are difficult to degrade. Many methods are used to remove dyes from wastewater but adsorption is an efficient one to remove different kinds of dyes from water and wastewater (Daneshvar et al., 2014).

Activated carbon is widely used as an adsorbent for the organic compounds such as dye molecules, COD, etc. and inorganic compounds such as heavy metals, etc in wastewater because
of its high adsorption capacity, large surface area and microporous structure (Low et al., 2011). Activated carbons are carbonaceous materials that can be produced by physical and chemical activation. The chemical activation usually has higher carbon yield and better developed pore structure than the physical activation (Li et al., 2008). A wide variety of carbonaceous materials can be used as activated carbons such as waste apricot (Basar, 2006), rattan sawdust (Hameed et al., 2007) and Posidonia oceanica (L.) dead leaves (Dural et al., 2011), etc. Sugarcane bagasse is an agricultural waste, abundant and low-cost in Lopburi, Thailand. Its main compositions are cellulose, hemicelluloses, lignin, silica and carbohydrates. In this study, the activated carbon was prepared from sugarcane bagasse and it was used for the adsorption of methylene blue. The adsorption was analyzed by isotherm and the kinetic models on batch process.

2. Material and Methods

Preparation of activated carbon

In preparation of activated carbon, sugarcane bagasse was collected from a local shop in Lopburi city. The sugarcane bagasse was washed several times with tap water to remove surface impurities followed by distilled water. Then it was dried in a hot air oven. The dried sugarcane bagasse was soaked in 3 mol/L phosphoric acid (H₃PO₄) with the ratio at 1: 10 g/ml of sugarcane bagasse: H₃PO₄ for 3 hr. Then it was dried at temperature 120°C for 24 hr. The char of sugarcane bagasse was carbonized at temperature 500°C for 1 hr. The acid activated carbon product was dried overnight and was washed with deionized water to pH 6−7 and dried in an oven at 120°C. The activated carbon (AC) was powdered and sieved to particle size of 50—100 mesh and stored in a dessicator until used.

Preparation of Adsorbate

Methylene blue (C.I. 52015, Molecular Formula C₁₆H₁₈N₃SCl, molecular weight = 319.86 g/mol) was used as an adsorbate in this study. It was supplied by Merck, Germany. Without further purification, it was dried and its stock solution (1000 mg/L) was prepared by dissolving an accurately weighed quantity of methylene blue in distilled water. Experimental solutions of the desired concentrations were obtained by dilutions with distilled water.

Adsorption Studies

Adsorption studies were performed in batch process. For each experimental run, 50 ml of a known concentration methylene blue solution (natural pH) was taken in a 250 ml Erlenmeyer flask containing 0.01 g of activated carbon. The flasks of methylene blue solution were shaken at 200 rpm in an isothermal shaker (30°C). At appropriate time interval, each sample was filtered and the methylene blue concentration was measured by a double beam UV—Visible spectrophotometer at 665 nm. The adsorption capacity (q_t) was calculated as follows:

\[
q_t = \frac{(C_o - C_t)V}{W} \quad \text{........(1)}
\]
Where \( C_0 \) and \( C_t \) (mg/L) are dye concentrations at the initial and any time (t, min), \( V(L) \) is the volume of the solution, \( q_t \) (mg/g) is the amount adsorbed at any time (min) and \( W(g) \) is the mass of adsorbent.

### Adsorption Isotherm

The Langmuir isotherm assumes the existence of monolayer of adsorbate at the surface of adsorbent and its linear form is represented as follows:

\[
\frac{C_e}{q_e} = \frac{1}{q_m} + \frac{1}{K_L q_m} C_e \tag{2}
\]

Where \( C_e \) (mg/L) is the equilibrium concentration, \( q_e \) (mg/g) is the amount adsorbed at equilibrium, \( K_L \) (L/mg) is the Langmuir constant and \( q_m \) (mg/g) is the maximum adsorption capacity.

The Freundlich isotherm assumes the existence of multilayer of adsorbate at the surface of adsorbent. The Freundlich isotherm in linear form is represented as follows:

\[
\log q_e = \log K_F + \frac{1}{n} \log C_e \tag{3}
\]

Where \( K_F \) (L/g) is the adsorption capacity and \( 1/n \) is the adsorption intensity.

The Temkin isotherm assumes that the heat of adsorption of all molecules in a layer decreases linearly with the surface coverage of the adsorbent due to sorbate—adsorbate interactions. The Temkin isotherm in linear forms is represented as follows:

\[
q_e = \frac{RT}{b_T} \ln A + \frac{RT}{b_T} \ln C_e \tag{4}
\]

Where \( RT/b_T \) is \( B \) and \( b_T \) is a constant related to heat of sorption (J/mol), \( A \) is Temkin isotherm constant (L/g) corresponding to the maximum binding energy, \( R \) is the gas constant \((8.314 \text{ J/mol.K})\) and \( T \) is the absolute temperature (K).

The Dubinin—Radushkevich (D—R) isotherm is used to determine whether the adsorption is chemical or physical in nature and it is used to calculate sorption energy. The Dubinin—Radushkevich isotherm in linear form is represented as follows:

\[
\ln q_e = \ln q_o - K_{DR} \varepsilon^2 \tag{5}
\]

By plotting \( \ln q_e \) versus \( \varepsilon^2 \) (\( \varepsilon = RT \ln (1 + 1/C_e) \)), the straight line is obtained, where \( K_{DR} \) \((\text{mol}^2/\text{kJ}^2)\) is calculated from the slope and the adsorption capacity \( q_o \) (mg/g) is calculated from the intercept. The constant \( K_{DR} \) gives an idea about the mean adsorption energy \( E \) (kJ/mol) of the adsorbate and the equation is shown as follows:

\[
E = \frac{1}{\sqrt{2K_{DR}}} \tag{6}
\]
Adsorption Kinetic

The kinetic adsorption data are processed to understand the dynamics of adsorption process in terms of the order of rate constant. In this study, the kinetic data were treated with the pseudo—first order (7) and pseudo—second order (8), respectively. The two kinetic models in a linear form are written as follows:

\[
\log (q_e - q_t) = \log q_e - \frac{k_1 t}{2.303} \quad \ldots \ldots (7)
\]

\[
\frac{t}{q_t} = \frac{1}{k_2 q_e} + \frac{1}{q_e} \quad \ldots \ldots (8)
\]

When \( k_1 \) (min\(^{-1}\)) is the rate constant of pseudo—first order adsorption and \( k_2 \) (g.mg\(^{-1}\).min\(^{-1}\)) is the rate constant of pseudo—second order adsorption.

The intraparticle diffusion model shows that the adsorption process occurs in three steps (Cheung et al., 2007). The first, sharper portion is attributed to the diffusion of adsorbate through the solution to the external surface of adsorbent or the boundary layer diffusion of solute molecules. The second portion describes the gradual adsorption stage, where intraparticle diffusion is rate limiting. The third portion is attributed to the final equilibrium stage where intraparticle starts to slow down due to extremely low adsorbate concentration in the solution. The intraparticle diffusion model is expressed as:

\[
q_t = k_{id} (t)^{1/2} + C \quad \ldots \ldots (9)
\]

where \( q_t \) is the amount of adsorbate retained at time \( t \), \( k_{id} \) is the intra—particle diffusion rate constant (mg g\(^{-1}\) min\(^{-1}\)), \( C \) is the intercept explaining about the boundary layer thickness of external diffusion.

3. Results

Effect of contact time

The plot between the adsorption capacity versus the contact time for initial dye concentration 100 mg/L was shown in Figure 1. The results showed that the adsorption capacity increased with the contact time. The rapid adsorption was observed during the first 15 min. Then, the adsorption became less efficient and reached the equilibrium at 240 min. The adsorption capacity at equilibrium was 277.125 mg/g.
Effect of initial dye concentration

The plot between adsorption capacity versus the initial dye concentration (50–250 mg/L) was shown in Figure 2. The result showed that the amount of dye adsorbed (\(q_e\)) increased from 210.678, 277.476, 394.775, 414.925 to 425.318 mg/g as the concentration was increased from 50, 100, 150, 200 to 250 mg/L, respectively. The adsorption capacity (\(q_e\)) remained nearly stable as the concentration increased to 250 mg/L.

Adsortion Isotherm studies

From the study of effect of initial dye concentration, the linear plots (not shown) of isotherms of methylene blue adsorption were investigated. From the linear plots, the isotherm constants and their corresponding correlation coefficients (\(R^2\)) were calculated in Table 1. The results showed that the correlation coefficients of Langmuir isotherm (\(R^2=0.983\)) was higher than that of the Freundlich, Temkin and Dubinin–Radushkevich isotherm. Therefore, the adsorption data were best fitted with the Langmuir isotherm and the maximum adsorption capacity (\(q_{m}\)) was found to be 476.191 mg/g. The Langmuir isotherm confirmed the monolayer coverage of methylene blue onto adsorbent.

For Freundlich isotherm, \(1/n\) and \(K_F\) were calculated from the slope and intercept of the linear plot between \(\log q_e\) versus \(\log C_e\). From Freundlich isotherm, \(1/n\) value was 0.248 which
indicated that the adsorption was favorable. From the Temkin plot between $q_e$ versus $\ln C_e$, the parameters were estimated: $A_T = 0.450 \text{ L/g}$ and $b_T = 32.117 \text{ J/mol}$. As seen in Table 1, the Dubinin–Radushkevich constants such as $q_o$ and $K_{DR}$ were determined from the linear plot using equation (5). The values of $q_o$ and $K_{DR}$ were 380.189 mg/g and $7 \times 10^{-6} \text{ mol}^2/\text{kJ}^2$, respectively. Also, the estimated value of mean energy ($E$) was 0.267 kJ/mol.

Table 1. Isotherm parameters for methylene blue adsorption onto activated carbon

<table>
<thead>
<tr>
<th>Isotherms</th>
<th>Langmuir (mg/g)</th>
<th>Freundlich</th>
<th>Temkin</th>
<th>Dubinin–Radushkevich</th>
</tr>
</thead>
<tbody>
<tr>
<td>$q_m$</td>
<td>476.191</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$K_L$ (L/mg)</td>
<td>0.058</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.983</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$K_F$ (L/g)</td>
<td>121.218</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$1/n$</td>
<td>0.248</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.919</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$B$</td>
<td>78.436</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$b_T$ (J/mol)</td>
<td>32.117</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$A_T$ (L/g)</td>
<td>0.450</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.879</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$q_o$ (mg/g)</td>
<td>380.189</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$K_{DR}$ (mol^2/kJ^2)</td>
<td>7 \times 10^{-6}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$E$ (kJ/mol)</td>
<td>0.267</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.701</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Kinetic studies

From the study of effect of contact time to adsorption, the plots of pseudo–first order, pseudo–second order kinetics and intraparticle diffusion of methylene blue adsorption onto activated carbon were shown in Figure 3 a, b and c, respectively.

![Figure 3](image)

a. pseudo–first order  
b. pseudo–second order  
c. Intraparticle diffusion model

Figure 3. Kinetic models of methylene blue adsorption on activated carbon

The kinetic parameters were calculated in Table 2. The kinetic studies were carried out for initial dye concentration 100 mg/L at 30°C. As in Table 2, the correlation coefficient of
pseudo—second order model \( (R^2 = 0.990) \) was better than pseudo—first order model \( (R^2 = 0.922) \). The kinetic data were fitted better with pseudo—second order model. However, the \( q_e \) values estimated from the pseudo—first (239.883 mg/g) and pseudo—second (333.333 mg/g) order kinetic models were not in accordance with the experimental one (277.215 mg/g).

For the intraparticle diffusion parameters in Table 2, the correlation coefficient \( (R^2 = 0.992) \) value obtained was higher compared to those obtained from pseudo—second order model \( (R^2 = 0.990) \) and pseudo—first order model \( (R^2 = 0.922) \). As shown in Figure 3c, the plot between \( q_e \) versus \( t^{1/2} \) gave two straight lines. In Figure 3c, the external surface adsorption was not seen because this stage was fastest and completed before 5 min, and then the stage of intraparticle diffusion control (the first linear line in Figure 3c) was attained and continued from 5 min to 240 min. Finally, the equilibrium adsorption (the second line in Figure 3c) started after 240 min.

### Table 2. Kinetics parameters for methylene blue adsorption on activated carbon

<table>
<thead>
<tr>
<th>Kinetics models</th>
<th>Pseudo—first order</th>
<th>Pseudo—second order</th>
<th>Intraparticle diffusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>( q_e^{(exp)} ) (mg g(^{-1}))</td>
<td>( q_e ) (mg g(^{-1})) = 239.883</td>
<td>( q_e ) (mg g(^{-1})) = 333.333</td>
<td>( q_e ) (mg g(^{-1})) = 277.393</td>
</tr>
<tr>
<td>( k_1 ) (min(^{-1}))</td>
<td>( k_1 ) (min(^{-1})) = 0.009</td>
<td>( k_2 ) (g mg(^{-1}) min(^{-1})) = 0.0001</td>
<td>( k_d ) (mg g(^{-1}) min(^{-1/2})) = 15.534</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>( R^2 = 0.922 )</td>
<td>( R^2 = 0.990 )</td>
<td>( R^2 = 0.992 )</td>
</tr>
</tbody>
</table>

### Discussion

Adsorption of methylene blue onto activated carbon prepared from sugarcane bagasse was studied. The results showed that the adsorption capacity increased with the contact time and the initial methylene blue concentration. The rapid adsorption at the initial stage of time was due to the abundant availability of active sites on the surface of activated carbon, and with the gradual occupancy of these sites the adsorption became less efficient and reached the equilibrium at 240 min. For the effect of initial dye concentration, it was found that the adsorption at equilibrium increased with the increase in dye concentration. The adsorption capacity increased with the initial dye concentration, this may be due to the increase in driving force of the concentration gradient for mass transfer with the increase in initial dye concentration (Farah et al., 2013).

The experimental adsorption isotherm data were described by Langmuir, Freundlich Temkin and Dubinin—Radushkevich isotherms. The best fit of experiment data in the Langmuir isotherm indicated the homogeneous nature by the monolayer coverage of sorbed molecules on adsorbent surface and the monolayer maximum adsorption capacity valued 476.191 mg/g. It was shown that the activated carbon prepared from sugarcane bagasse was efficient to adsorb methylene blue dye from aqueous solution. Similar observations were reported in literature for
monolayer adsorption of methylene blue onto activated carbon by Hameed et al., 2007 and Kumar et al., 2010.

The adsorption kinetic data were analyzed using pseudo—first order, pseudo—second order and intraparticle diffusion. It was found that the adsorption kinetic of methylene blue onto activated carbon was best described by pseudo—second order and intraparticle diffusion models. The highest correlation coefficient proved that the intraparticle diffusion involved significantly in the adsorption process. However, the linear portion of its curve did not pass through the origin indicated that the intraparticle diffusion was not the only rate-controlling step and the boundary layer diffusion controlled the adsorption to some degree (Cheung et al., 2012). Thus, surface adsorption and intraparticle adsorption were likely to take place simultaneously (Bulut et al., 2008). Also, the $q_e$ value estimated from intraparticle diffusion model was found to be very close to the experimental value of equilibrium adsorption with the highest coefficient ($R^2=0.992$). Similar observations were reported for crystal violet dye adsorption onto activated carbons derived from male flowers of coconut tree (Senthilkumaar et al., 2006) and methylene blue adsorption by Posidonia oceanica (L.) dead leaves (Dural et al., 2011).

4. Conclusions

In this study, the activated carbon prepared from sugarcane bagasse was used as an adsorbent for the removal of methylene blue in aqueous solution by batch process. The equilibrium adsorption data were fitted well with the Langmuir isotherm and maximum adsorption capacity valued 476.191 mg/g. Based on the correlation coefficient, the kinetics of methylene blue adsorption followed intraparticle diffusion. Moreover, the adsorption capacity ($q_e$, cal) estimated by intraparticle diffusion model was in accordance with the experimental adsorption capacity ($q_e$, exp). However, it was not the only rate-controlling step. Therefore, the process involved external adsorption and followed with intraparticle diffusion. The result of the study revealed that the activated carbon prepared from sugarcane bagasse was effective for the methylene blue adsorption.

5. References


A Study of Using Information Technology Media of teacher in Health and Physical Education Subject.

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Abstract

This study is part of a research in innovation adaption to use of Information Technology media of teachers in Health and Physical Education subject aims to 1) investigate the using of Information Technology media of Health and Physical Education subject teachers 2) Compare the Study of using Information Technology media of Health and Physical Education teachers subject. The survey study by using questionnaire was employed. The populations were Health and Physical Education teachers in Nakhon Sawan Province. The 50 people were sampling as sample group. The 4 research stages: 1) investigate the using of information Technology media, 2) surrey and gathering using of information Technology media, 3) analysis the adopting the use of information Technology media, and 4) compare the adoption the use of information Technology media. The filding as the most factors that effecting the use of IT media was technology equipments in associated the instructional media needs, and followed by self. Capability in using IT media in instruction, and the less factors that effective the use of IT media was the supportive of computer laboratory from schools.

Keywords: Adoption , using of Information Technology media, Media of teachers in Health and Physical Education subject, Thailand

1. Introduction

Promoting teaching materials requires to use of teaching materials accompanying the event. The activity of teaching with materials can give the students learn to do many things. And teacher can evaluated all the time. This is the way to approach helps to teach Health and physical education. Encourage students to learn a systematic process. Have a positive attitude toward physical education. The study of information technology in the teaching of health and physical education. Therefore it is extremely important to know the factors. Attitude of using information technology in the teaching of health and physical education. And know the different factors that affect the adoption of information technology in the teaching of physical education and health education groups. To guide the media in enhancing the skills and education to match the context of the teaching of the Health and Physical Education.
Purpose

1. Investigate the using of Information Technology media of Health and Physical Education subject teachers

2. Compare the Study of using Information Technology media of Health and Physical Education teachers subject.

Population and sample

The populations were Health and Physical Education teachers in Nakhon Sawan Province. The 50 people were sampling as sample group.

2. Research methodology

The survey study by using questionnaire was employed. The populations were Health and Physical Education teachers in Nakorn Sawan Province. The people were sampling as sample group. The 4 research stage. 1) Investigate the using of information Technology media, 2) Survey and gathering using of information Technology media, 3) Analysis the adopting the use of information Technology media, 4) Compare the adoption the use of Information Technology media.

3. Result and conclusion

According to a study by the research above. Can be analyzed as follows.

<table>
<thead>
<tr>
<th>No</th>
<th>The study of information technology in education.</th>
<th>( \bar{X} )</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do you have the need to use information technology education in teaching.</td>
<td>2.64</td>
<td>0.49</td>
</tr>
<tr>
<td>2</td>
<td>The use of information technology in education gives you more knowledge even more.</td>
<td>4.44</td>
<td>0.71</td>
</tr>
<tr>
<td>3</td>
<td>You have to be very hard to use educational technology in teaching.</td>
<td>2.64</td>
<td>0.49</td>
</tr>
<tr>
<td>4</td>
<td>You have the convenience of using information technology in education is huge.</td>
<td>2.80</td>
<td>0.76</td>
</tr>
<tr>
<td>5</td>
<td>See other people use technology in education to teach you wanted to teach me.</td>
<td>2.00</td>
<td>0.65</td>
</tr>
<tr>
<td>6</td>
<td>Your use of information technology education to learn a job search and information easily.</td>
<td>2.16</td>
<td>0.69</td>
</tr>
<tr>
<td>7</td>
<td>I still do not understand the use of information technology in education.</td>
<td>2.84</td>
<td>1.07</td>
</tr>
<tr>
<td>8</td>
<td>Do you think teaching using information technology in education is interesting and should be done, because it was led media to teach them.</td>
<td>2.20</td>
<td>0.76</td>
</tr>
<tr>
<td>9</td>
<td>You are not sure if taught using information technology in education that allows students to understand lessons and more.</td>
<td>2.68</td>
<td>0.48</td>
</tr>
<tr>
<td>10</td>
<td>Do you think teaching using information technology in education can help reduce the steps to teach.</td>
<td>2.20</td>
<td>0.76</td>
</tr>
</tbody>
</table>
The study of information technology in education.

<table>
<thead>
<tr>
<th>No</th>
<th>Question</th>
<th>$\bar{X}$</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Do you think teaching using information technology in education is not suitable for all classes.</td>
<td>2.72</td>
<td>0.98</td>
</tr>
<tr>
<td>12</td>
<td>Do you think the use of information technology in education makes learning fun, not boring.</td>
<td>4.56</td>
<td>0.51</td>
</tr>
<tr>
<td>13</td>
<td>Do you think the media, information technology, education can learn an unlimited time and place.</td>
<td>2.76</td>
<td>0.66</td>
</tr>
<tr>
<td>14</td>
<td>You will use the information technology educational materials to teach because teaching is beneficial to the child.</td>
<td>2.68</td>
<td>1.03</td>
</tr>
<tr>
<td>15</td>
<td>Do you think that teaching by using information technology can solve the educational problems of teaching when schools were introduced to the media as well.</td>
<td>4.28</td>
<td>0.68</td>
</tr>
<tr>
<td>16</td>
<td>Teaching using information technology in education, he has enlarged eager to teach more.</td>
<td>2.12</td>
<td>0.67</td>
</tr>
<tr>
<td>17</td>
<td>Do you think teaching using information technology in education has contributed to the group's achievement is better.</td>
<td>2.60</td>
<td>0.50</td>
</tr>
<tr>
<td>18</td>
<td>Do you think the use of information technology in education by teaching learners make your information needs, keep abreast of world events.</td>
<td>4.60</td>
<td>0.50</td>
</tr>
<tr>
<td>19</td>
<td>Do you think teaching using information technology in education is vital to teaching.</td>
<td>2.76</td>
<td>0.97</td>
</tr>
<tr>
<td>20</td>
<td>Do you think that learning using information technology in education is superfluous.</td>
<td>2.00</td>
<td>0.65</td>
</tr>
</tbody>
</table>

Table 1 showed that teachers think that teaching using information technology in education makes learning your information needs, keep up the pace of events as the reason for teaching the use of information technology in education the most. followed by the teachers think that the use of information technology in education makes learning fun, not boring, and No. 3 is the use of information technology in education gives you more knowledge even more.

Table 2. Grouping the adoption of innovative teaching and health education. Physical Education in Nakhon Sawan province.

<table>
<thead>
<tr>
<th>No</th>
<th>The group adopter innovation</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(Innovators) group is mainly personal preference.</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>(Early adopters) group is a required part of their daily work.</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>(Early majority) group is ready to accept fear and to lag behind.</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>(Late majority) group is prepared to spend like everyone else.</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>(Laggards) is The group denied Technology</td>
<td>18</td>
</tr>
</tbody>
</table>

Table 2 shows that in the group, who taught physical education and health education in the city. Nakhon Sawan In the USSR Innovation or walk away Most first 32 percent is classified as the second most later. 24 percent, the third group is the majority of
the first. 20 percent in the fourth group is progressive. 12 percent and is the fifth group of innovators. 8 percent.

3. Result

The finding as the most factors that effecting the use of IT media was technology equipments in associated the instructional media needs, and followed by self. Capability in using IT media in instruction, and the less factors that effective the use of IT media was the supportive of computer laboratory from schools.

4. References


The Survey Life Assets of Children and Youth in the Nakhonsawan Municipality.

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Abstract

Due to the trend of social problems have intensified and there were the key priority. The immunity such a life asset should be created for children and youth especially to sustain and strengthening their well being. This study was to investigate the life assets of children and youth between 12 and 18 year old in Nakhonsawan Municipality and guidelines for the second phase of the study were: (i) the quantitative study to get information on the weaknesses and strengths of children and youth (ii) developing findings are the weaknesses and strengths remain. The variable in this study consisted five main powers which is power of self, power of family, wisdom power, power of peer and power of community. The study showed that three sampling group (children and youth and parent in Nakhonsawan Municipality) have different opinions and point of view. The results of this study could be presented to Nakhonsawan Municipality in determining a public policy or suggestion in term of guideline for development life assets by integrated the weakness points and work together with participation from various sector

Keywords: Life assets, children and youth in Nakhonsawan Municipality

1. Introduction

High life assets - low risky behavior, Low life assets – high risky behavior: Children and youth were power and creative potential. Immunization for children and youth should comprehensive from early childhood, school – age child and adolescence. This study was to investigate to know the child before his teens take care of the parents and educational institution is life assets any weakness. So when we studied a group of children and youth aged 18 to know the life assets from childhood to adolescence ago that the one strong and weak side to prepare for adulthood. If survey both at the community and national levels, according to the boundaries change regularly this will make it possible to define a strategy for each level is clear and concrete.

The trend of a variety of social problems. If children and youth people of Thailand are not strong enough to deal with the problems found. Inevitably leads to a bad solution.
Therefore, it is necessary and very important to strengthen the immune system to teenagers. Thailand have life assets strong, ready to live safely and happy. The survey the life assets of youth across the county found that since 2009, including five shots (power of self, power of family, wisdom power, power of peer and power of community) on the weakness side is the power of community. While the family is the strongest force. (Suriyadeo Tripathi et al, 2004)

Life assets, which is a fundamental impact on the development of psychological social and intelligence a person that is able to live in a society very strongly. Every person is born with the life assets on one level of both internal assets and external assets. This life assets will be increased or decrease by the take care of parents environment and nature. Anyone lucky to live in a good family and a good environment, a sympathetic development to life assets is very strong. However, any person living with conflict and disadvantaged environment not conductive to learning what is good to life assets is gradually being undermined and gradually reduced (Kanjaanakul, N, 2012: 4). When the life assets has been eroded steadily declining and could affect the life skills of children and youth cannot handle the demands and challenges that are faced on a daily basis, whether it’s sex, substance abuse, family life, health and social problems that arise. This will affect both the body and mind deteriorate and affect the lack of virtuous conduct, irresponsible, non self-discipline and disregard the rule of society (World Health Organization, 1997: 2).

Enhancing life assets of children and youth are often influenced by factors in the children themselves. Including external factors such as family, school, friends and community. If you can control factors and strengthen the support provided is appropriate to contribute to the development life assets of children and youth to grow and better quality can live in place with the sharp and sustained health. The life assets is a factor creates or a nice feature. Including is psychological, social and cultural to affect thought processes, decision making and self-expression patterns in behavior as a result of exposure to strengthen the child since birth until adulthood (Suriyadeo Tripathi, 2011) From the above, it is why the researcher is interested to study “The developmental assets of children and youth in the Nakhonsawan Municipality : Nakhonsawan Province. To the information to be used as a guide to develop and strengthen cost the lives of children and youth to the life assets healthier live and cope with climate change, as well as manage and resolve the issue appropriately in the future.

2. Materials and Method

This study examines a combination of qualitative research and quantitative research (Mixed Method) with the procedure and how important the following.

Qualitative Research

i. The goal of the research is composed of three groups of parents, children and youth in Nakhonsawan Municipality. There is no way to determine the size of the sample using a
The sample size was 374 people as parents, children aged 12 years 358 people and youth aged 18 years 364 people.

ii. The tools used to collect data are evaluated life assets of children and youth developed by Dr. Suriyadeo Tripathi et al. (2009). The questionnaire consists of five power is power of self 15 indicators, power of family 8 indicators, wisdom power 11 indicators, power of community 8 indicators and power of peer 6 indicators to total 48 indicators.

iii. How to collect data (i) The team held a meeting to collect field data (a fourth year student at the Faculty of Political Science, a research assistant) about the purpose of the research, the content of the questionnaire, procedures, methods of data collection and recording. (ii) Questionnaires distributed to the team. (iii) The team took a questionnaire to collect data on the target area. (iv) Collect all queries to be analyzed and processed by a computer. (v) Data editing by the data validation, editing, compiling and writing for publication presented next.

iv. Analysis of the data will be processed by computer program, for a query that question as a comment on technical Likert Scale (very often = 3 points, fairly often = 2 points, sometimes = 1 point and never = 0 point). The result will be interpreted after collecting the target successfully (less than 60 = no pass, between 60-70 = moderate, between 70-80 = good and above 80 = very good)

Qualitative Research

Using a focus group of four times, each time will be divided into small groups to discuss the five subgroups [(i) children aged 12 years (ii) youth aged 18 years (iii) parents (iv) community representatives (v) the government agencies involved in the development of life assets], in order to guide the development life assets of children and youth in the Nakhonsawan Municipality, where appropriate.

3. Results

The measure life assets of children and youth this time, as a measure for the purpose of surveillance of children and youth from the environment and other risk factors that are happening today.

The life assets of children and youth is study found, power of family include the life assets most powerful sequence, followed by power of self and wisdom power, which has life assets meet at a good level. For power of community and power of peer with the life assets over the threshold level, which the need to develop a much stronger following. Because of power of community and power of peer that influence to strengthen the most, so when the life assets is low it make children and youth behave more risk (see Figure 1)
The analysis of whole the life assets of 48 indicators, found that all the criteria, but there are some fairly level, which means that the life assets of children and youth are weak and need to be developed to a higher level. This shows that the life assets above most are weak and need to be developed urgently. (See Figure 2)

And considering the life assets of children and youth strengthened, found that children and youth feel that home and the educational institution as a place of love, warmth, security, making them feel that they satisfied with their lives. This information can be used to promote healthy the life assets even more. (See Figure 3)
4. Conclusion

Children aged 12 years as a child in the teen before him, rising of parents and educational institutions are crucial to children have a strong. The results showed that the children would the life assets of power of family remained only one side. In addition, the other side will be moderate. When considering the life assets are the most vulnerable. Children should be strengthening the life assets is very strong, more so do children love to read books, do children that teachers can rely on him, how the children can control the situation is happening to yourself and do not allow children to participate in religious activities and so on.

Children and youth aged 18 years of age before adolescence into adulthood has the life assets of power of self and power of family is in good shape, the other side will be moderate. When considering the life assets are the vulnerable. Children and youth should be encouraged to have life assets of strong, even more so how do love to read book, do children and youth can take and share and learn about the media and with teachers on a regular basis, do you homework or daily lessons, activities benefit the community and has been assigned the role of value and benefit to the community.

And for the opinion of parents is seen as the most power of family are strengthened. It is because parents pay more attention to the subject of love, caring, a good role model and mentor to children and youth, etc. as well. But for power of peer remained moderate, it is because parents see their relationship and conduct peer to do activities that are not appropriate, not untimely or do things that child do adults that is nonsense, no action would be. When considering the life assets are the most vulnerable. Should be encouraged to have life assets of strong, such activities benefit the disasters hit, has been assigned the role of value and benefit to the community, to control the situation on their own, participate in religious rituals on a regular basis and thirst for knowledge, wisdom and culture of the community.

5. References


An Analysis of Thai-English Translation Strategies in the Novel: A Case Study of Democracy, Shaken & Stirred

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Abstract

The two main purposes of this research were to analyze strategies used in translating the novel ประชำธิปไตยบนเส้นขนำน—Pracha Thippatai Bon Sen Khanan from Thai language into English language—Democracy, Shaken & Stirred and to find out the frequently of Baker’s strategies used in translating the novel. The text composed of two versions: the Thai version named, ประชำธิปไตยบนเส้นขนำน—Pracha Thippatai Bon Sen Khanan written by Lyovarin and English version, Democracy, Shaken & Stirred translated by Boonsinsukh. The source of data (texts) consisted of 1-6 chapters which were purposely selected. This study adopted both quantitative and qualitative methods. The quantitative method involved the calculation of frequency and percentage of each strategy found in the translation analysis and the calculation of Index of Item-Objective Congruence (IOC) while the qualitative method concerned the analysis of descriptive data and interpretive analysis. The texts of the two versions were analyzed in order to find what strategies were found in this novel translation under the theoretical framework of Baker. The results revealed that six translation strategies were applied by the translator, i.e. using a loan word or loan word plus explanation (34%), omission (30.37%), paraphrase using unrelated words (19.8%), using a more general word (7.6%), using a more neutral/less expressive word (4.36%), and paraphrase using a related word (3.87%).

Keywords: analysis of translation strategies, Thai-English translation, novel

1. Introduction

English is recognized as the most vital of all international languages. English is now the lingua franca mainly because of its widespread use for communication. This language belongs not only to countries such as the United Kingdom and the United States which have English language as a mother language but also to every country which uses the English language to communicate with each other (Alatis, 2004). It is inevitable that the English language will be a definite requirement for communication. In addition, English is used as a
means to interpret or transfer thoughts and cultures and to generate good relationships between people in different countries (Prachanant, 2012). As a result, English has become an international language and has influenced in Thai society, particularly students, teachers, and translators, etc. Translators are involved directly by translating source text language into the target text language. They are required to be proficient in both source language and target language in order to be successful translators. There are many problems when translating English into Thai or vice versa. The problems of non-equivalence often poses difficulties for the translator and some attested strategies for dealing with them. The choice of a suitable equivalence in a given context depends on a wide variety of factors. Some of these factors may be strictly linguistic other factors may be extra-linguistic. It is virtually impossible to offer absolute guidelines for dealing with the various types of non-equivalence which exist among languages (Baker, 1992, p.17).

Baker (1992) who notes that non-equivalence at a word level of the target language which has no direct equivalence for a word in the source text. She suggests strategies to cope with the problems e.g., translation by a more general word (TS1), translation by a more neutral/less expressive word (TS2), translation by cultural substitution (TS3), translation by using a loan word or loan word plus explanation (TS4), translation by paraphrase using a related word (TS5), translation by paraphrase using unrelated words (TS6), translation by omission (TS7), and translation by illustration (TS8) (Baker, 1992, pp. 26-42). Thus, these strategies will be used for focusing on the problems of non-equivalence.

2. Materials and Methods

This research utilized a mixed approach between both qualitative and quantitative methods of analysis. The qualitative method was applied to describe the translations strategies of Baker (1992) employed by the translator to cope with non-equivalence at a word level, whereas the quantitative method was used to calculate the frequency of occurrence of eight translation strategies found in the novel Democracy, Shaken & Stirred, ประชาธิปไตยบนเส้นขนาน—Pracha Thippatai Bon Sen Khanan.

The novel had eleven chapters. With the advisors’ advice and assistance, six chapters, chapter 1 to chapter 6 were selected as the samples because these six chapters could represent an appropriate analysis of the translation strategies. The source and target texts were analyzed in line with the theoretical frameworks of eight translation strategies suggested by Baker (1992).

The list analysis table was another crucial component used to analyze and display the translation strategies found in this study. The table consisted of four columns containing four elements: 1) Source text (ST), 2) Target text (TT), 3) Non-equivalence at a word level, and
4) Translation Strategies (TS) (Nuemaihom, 2013). The list analysis table of this study could be performed like below:

Table 1 The list analysis table

<table>
<thead>
<tr>
<th>No.</th>
<th>Source Text (ST)</th>
<th>Target Text (TT)</th>
<th>Non-equivalence at a word level</th>
<th>Translation Strategies (TS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>ลมร้อนปลำยเดือนเมษำยปี พ.ศ. 2476 พัดใบไม้สีน้ำตำลเกรียมบนต้นสักที่ยืนแห้ง</td>
<td>The scorching wind at the end of April 1933 kissed the parched leaves with a final death sending them floating down to carpet the cracked earth. (Boosinsukh, 2004, p. 17)</td>
<td>ต้นสัก</td>
<td>The translator applied translation by using TS7 (omission) i.e. ต้นสัก because leaves with a final death could provide enough understanding for the readers.</td>
</tr>
</tbody>
</table>

The researcher collected data from the novel ประชาธิปไตยบนเส้นขนาน—Pracha Thippatai Bon Sen Khanan, the original version, first edition: 1994 by 113 Press and “Democracy, Shaken & Stirred”, the translated version. The steps to collect the data were as follows:

1. The researcher studied and analyzed the theme of the story by reading the entire source and target texts.
3. The researcher selected chapter 1 to chapter 6 as the samples from both the source text and target text.
4. The researcher compared the target text with the source text, sentence by sentence, and then divided it into the table list.
5. The process of coding was made based on the translation strategies of Baker (1992).
6. The coding was submitted to the advisors, and also the three experts to examine for the correctness. The process to submit the coding consisted as the following:

   1. The thesis instrument, three experts namely: Dr. Prommin Kongkaew, Dr. Surachai Piyanukool, Assistant Professor Dr. Thawascha Dechsubha.
   2. With the advisors’ advice, the coding was 212 sentences from six chapter, original one was not counted the frequency yet. The researcher considered they were applied in the novel by a translator under theoretical framework of Baker’s (1992) translation strategies.
3. All of this coding was handled to the advisors first, then it was submitted to the three experts.

7. If the consequence of Index of Item-Objective Congruence (IOC) examined by the three experts was between 0.5-1.0, it was acceptable. However the IOC that was lower than 0.5 had be revised and rechecked through the assistance of advisors.

The frequency of each strategy used in translation analysis was calculated in percentage by the following formula:

\[
\frac{N \times 100}{T}
\]

\(N=\) The number of each strategy was used in translation analysis
\(T=\) The total number of strategies was used in translation analysis

The percentage of frequency of each strategy was presented in a table form for both source text and target text, highlighting the highest frequency used and the least frequency (Vorajaroensri, 2002; Duangloy, 2006; Pathomthong, 2015)

### 3. Results

**Table 2** Frequency and Percentage of Baker’s (1992) Translation Strategies Found in the Novel

<table>
<thead>
<tr>
<th>Translation Strategies</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Using a more general word (TS1)</td>
<td>47</td>
<td>7.6</td>
</tr>
<tr>
<td>2. Using a more neutral/less expressive word (TS2)</td>
<td>27</td>
<td>4.36</td>
</tr>
<tr>
<td>3. Cultural substitution (TS3)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4. Using a loan word or loan word plus explanation (TS4)</td>
<td>210</td>
<td>34</td>
</tr>
<tr>
<td>5. Paraphrase using a related word (TS5)</td>
<td>24</td>
<td>3.87</td>
</tr>
<tr>
<td>6. Paraphrase using unrelated words (TS6)</td>
<td>123</td>
<td>19.8</td>
</tr>
<tr>
<td>7. Omission (TS7)</td>
<td>188</td>
<td>30.37</td>
</tr>
<tr>
<td>8. Illustration (TS8)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>619</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Discussion**

The research findings showed that six out of eight translation strategies of Baker were applied by the translator in order to solve the problems of non-equivalence at a word level. These six translation strategies were used ranging from using a loan word or loan word plus explanation strategy at the highest frequency (34%), to the strategy of translation by paraphrase using a related word, being used at the lowest frequency (3.87%).

Moreover the strategy of using a loan word or loan word plus explanation (34%). The translator applied this strategy because it is helpful when the uncertain word i.e. proper noun in source text is repeated many times. This does not exist in a target text. However, even some
words could be replaced by a word of the target language the translator had been insisted to use a loan word or loan word plus explanation in order to remain a unique source language. This results is relatively different from the following previous studies: Khogbumpen (2008) displayed that this strategy was used at the third frequency (12.38%). Roekmongkhonwit (2006), and Ajanapanaya and Tangkiensirisin (2015) found that this strategy was used at the fourth frequency at 14.58% and 16.36%. Whereas, Duangloy (2006) revealed that this strategy was used at the sixth frequency (5.05%). Furthermore, Mungchomklang (2009) discovered that using a loan word or loan word plus explanation was applied at the second frequency (22.73%).

It can be noted that, the results in this section was different from all of previous studies because they were different genre i.e. article, travel document, and novel—source text (ST). Even though, Duangloy who analyzed the translation strategies were employed in the novel—Behind the Painting. But in her studied merely analyzed one chapter, the data was selected from Chapter 19. If she analyzed all chapters it might be found more strategies or might be as the same results.

The second translation strategy found in this study was omission (30.37%). This strategy was employed with the major purpose of avoiding the terms which the reader of the target language is not interested in. In addition, the translator omitted the expression of sentences which were useless and meaningless in a target language such as pronoun, particle, and modifier. The findings of this study are different from the research conducted by the following scholars: Khongbumpen (2008) found that the omission strategy was used at the highest frequency at 43.81%. Mungchomklang (2009) and Duangloy (2006) discovered that this strategy was used most frequently at 46.60%, and 37.38% respectively. Moreover, Roekmongkhonwit (2006), and Ajanapanaya and Tangkiensirisin (2015) found that the frequency of use of the omission strategy to be third (17.70%) and (17.60%). However, this strategy was not found by Vorajaroensri (2002).

It can be seen that, the results findings in this section was different from previous studies due to a distinction of the typing texts. Even, they were Thai languages but if the authors performed different purposes, the results could not be similar.

The third most frequently used found in this study was paraphrase using unrelated words (19.8%). The translator applied this strategy because some concepts in Thai language were not understandable in English language, so these concepts should be paraphrased to make readers of the target language acquire the concepts in the source language. This was slightly different from the previous studies as the following: Duangloy (2006) found this strategy in the fourth frequency (14.14%), Roekmongkhonwit (2006), and Ajanapanaya and Tangkiensirisin (2015) reported that the translator applied this strategy at the fifth frequency of their study at 11.45%, and 9.94%. Moreover, Khongbumpen (2008), and Mungchomklang (2009) used this strategy at the sixth frequency in their study at 5.72% and 4.55% respectively.
As shown above, a differentness in the source texts had influenced to the consequences of each study. The novel has a unique language by itself. Therefore, while the translator tried to replace the words in target language she should be paraphrased to make the audiences of the target texts obtain the concepts in Thai language.

The fourth most frequently used strategy was a more general word (7.6%). This strategy was often used by the translator to solve many kinds of non-equivalence. Translation by a more general word was the process which the translator finds the wider meaning of the word in target language. This study was quite different from the previous studies as the following: Mungchomklang (2009) whose study revealed that this strategy was the third most frequently used (10.80%). Whereas, Khongbumpen (2008) found that this strategy was the second most frequently used (17.14%), and Roekmongkhonwit (2006) study reported that this strategy was the sixth most frequently used (8.33%). Interestingly, Ajanapanaya and Tangkiengsirisin (2015) found that this particular strategy was at the highest frequency (28.36%), but this strategy was not found by Vorajaroensri (2002).

In this section it cannot be denied that, there were differences between the source language and target language, could cause many problems during translating the meaning from one language into another language. And if the researcher conducted in different fields it could be different in the results. In this study, the researcher was analyzed the translation strategies applied by the translator in Thai novel. The translator was employed a more general word at the fourth frequency caused by Thai language was very complicated. She could not find a specific or proper word that has the identical meaning with the source language—Thai novel, so she solved this problem by translating it with a more general word.

The fifth most common method applied by the translator was a more neutral/less expressive word (4.36%). Evidently, in translation of a novel Democracy, Shaken & Stirred, the translator used translation strategies by a more neutral/less expressive word to render the terms from source language into target language by using a less or more emotional word. This was done for trying to keep the similar meaning of source language. The findings of this study was similar to the previous study as: Khongbumpen (2008) used this fifth strategy most frequently (7.62%) whereas Ajanapanaya and Tangkiengsirisin (2015) applied this strategy at the sixth frequency (5.18%). In addition, Roekmongkhonwit (2006), and Mungchomklang (2009) least used this strategy at 4.16% and 1.14% respectively. Furthermore, Duangloy (2006) found that a more neutral/less expressive word was most commonly used at the second frequency (16.16%).

As shown above, this study was quite similar to Khongbumpen’s studied, due to Khongbumpen conducted the strategies employed in translation Thai into English in the article entitled “Vimanmek Mansion Museum” were described resemblance to Thai novel. People mostly thought a novel and article had distinguish between each other but the author wrote Thai novel with less-emotional words due to the author focused on the detail of a political
history, with this reason could be caused the translator applied a more neutral/less expressive word at the fifth frequency. Whereas, this study relatively dissimilar to the others previous studies caused by unlikeness of source texts.

The least used strategy was translation by paraphrase using a related word (3.87%). This strategy was employed when the translator cannot find a word close to the source language. The best way to deal with this obstacle was to replace the lexical terms with possible close meanings. In addition, in this study the translator chose terms were appropriated to replace in the target language. Comparing to the previous studies this findings is similar to Khongbumpen (2008) whose study displayed that translation by paraphrase using a related word was the least frequency applied by the translator (4.76%). Whereas Mungchomklang (2009) found that this strategy was used at the fifth frequency (6.25%). Duangloy (2006) reported that this strategy was used at the third frequency (15.15%). Meanwhile, Ajanapanaya and Tangkiengsirisin (2015) found that this strategy was applied at the second frequency (20.29%). Interestingly, Roekmongkhonwit (2006) found that this particular strategy was at the highest frequency (25%).

It can be noted that, the results in this section similarity to Khongbumpen because the source texts quite the same in some points, according to the researcher had mention whether Khongbumpen and the researcher’s source texts were slightly similar to each other even there were different genre. The author wrote the novel like an article style by preserving the main point of a political history. On the other hand, the findings in this study quite different from the others previous studies due to unlikeness of source texts. However, two strategies were not found in this study i.e. translation by cultural substitution (TS3) and translation by illustration (TS8) might be the reason that a writing the novel did not like the others typing writing such as academic writing, the Bible, law, and etc., which were used more technical terms and needed to explain more in detail. Moreover, the expression found in the novel was easiest to understand and no need to solidify it by using these strategies.

4. Conclusion

In conclusion, the researcher found that the translator of the novel Democracy, Shaken & Stirred employed the strategy of translation by using a loan word or loan word plus explanation with the highest frequency (34%) and the strategy of translation by paraphrase using a related word as the least frequency (3.87%). However, the translation by cultural substitution (TS3) and translation by illustration (TS8) were not found. According to the research results of this study, the recommendations are to provide translation strategies to cope with the non-equivalence for those who are interested in translation and for translators in order to increase and develop their field of translation. The study results could also be useful for academics and teachers teaching translation and students studying translation
courses. And recommendations for further studies are translation strategies used for translating from Thai into English languages is recommended, other types of literal works such as short story, poetry and non-fiction, etc., are recommended for further studies of translation strategies and translation strategies or techniques are recommended to study in other types of literature.

5. Acknowledgement

Firstly, I would like to express my deep gratitude to the honorable thesis chairman, Assistant Professor Dr. Pragasit Sitthitetkul, thesis examination committee, Assistant Professor Dr. Nawamin Prachanant, and the Dean of Graduate School, Assistant Professor Dr. Narumon Somkuna, for giving me permission to conduct this thesis. I am deeply indebted to my thesis instrument, the three experts: Dr. Prammin Kongkaew, the Head of English Program, Faculty of Humanities and Social Sciences at Ubon Ratchathani Rajabhat University, Dr. Surachai Piyanukool, the English lecturer at English Program, Faculty of Humanities and Social Sciences at Buriram Rajabhat University, and Assistant Professor Dr. Thawascha Dechsubha, the Chairman of TEFL Curriculum of Master’s Degree at Nakhon Ratchasima Rajabhat University. I would also like to extend my thanks to the entire scholars whose texts that I reviewed and employed for resources material in this thesis. Finally, I would like to give my special thanks to my parents and also my beloved wife, Ms. Maneerat Laolert (Kongrith), whose patient love enables me to complete this work.

6. References


[38] Thassanawadee (Pseudo). (2014). *The Vow in Front of the Flagpole (Selected 2 Languages Short Stories)*. Bangkok: White Line.


Health Information of the Older Adults to Prepare for Aging Society in Community

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Abstract

The purpose of this research was to study the health information of older adults in community. The Samples were older adults selected by multi-stage sampling in Nakhon Sawan Provience, Thailand. The instrument was the Demographic Data Questionnaire of the older adults such as age, sex and health information. The quantitative data were collected and analyzed by computer program. The qualitative data were analyzed by using content analysis.

The research findings revealed that the older adults were in age between 71-79 and 61-69 years old, mostly female and marriage. Their health information of older adults shown that health status, body mass index, life satisfaction and health promotion behavior were at the acceptable level. This research also assessed older adult health care information. Although this finding is a part of total research but these health information can be used for further strategic planning for aging society in community.

Keywords: Health information, Older adult, Aging society, Community

1. Introduction

The population of the world is changing. The large amount of the older adults is increasing into aging society. Ageing population is a phenomenon that occurs when the rising life expectancy and declining fertility rates. An increase in life expectancy which causes the ageing of populations. This is the case for every country in the world. (UN Human Development Report 2005, 2008) United Nations Population Division said that the aged population is currently at its highest level and predicts the rate of population ageing in the 21st century will exceed that of the previous century. The number of people aged 60 years and over has tripled since 1950, reaching 600 million in 2000 and surpassing 700 million in 2006. It is projected that the combined senior and geriatric population will reach 2 billion by 2050. Countries vary significantly in terms of the degree and pace of these changes, and the UN expects populations that began ageing later will have less time to adapt to the many implications of an increasingly elderly society.
World population is changing into aging society and also in Thailand. In 2000, Thailand will have 4.5-5.7 million older adults, 6.8-7.6 million in 2010 and up to 10.8 million in 2020. The proportion of aging among groups and the expectation average aged in Thai population are increasing. Thai older adults are also lifelong living until 68.15 years old in male and 72.39 years old in female. (The Office of National Statistic. 2012). A lot of older adult group who still alive are encouraging with health problems and disabilities, both physical and psychological. They will meet one or more health problems since slightly and severe problem. More than a half of elderly has disease or chronic illness. (The Ministry of Health. 2012) The older adults with health problem need continuous health care. These are all effect to their health information and life satisfaction.

Thailand came into aging society in 2011 and will become to absolutely aging society in 2030. Aging society will impact all related-sectors. If Thai-stakeholder did not prepare appropriated support for developing area in the country. There are various strategies to develop older adults in Thailand such as: The 10th National Socioeconomic Plan (2007-2011) emphasized on humankind and society development in knowledge and learning followed by the King Bhumipol Initiative. The 11th health development plan (2012-2016) stressed on sufficiency health to create healthy, good health services, good society, and happiness. The aging act (2003) protected, promote, and support older adults related with the strategic planning to prepare aging society in Thailand. The 2nd National Elderly Plan (2002-2021) emphasized on integrated aging care, especially in knowledge processing and developing about aging. Ministry of Public health supported the research and development in public health and promoted good health behaviors and health promotion.

Nakhon Sawan is a biggest province in the south-Northern division of Thailand and there are a lot of aging population in Nakhon Sawan Province. The expected amount of older adults is about 110,829 with 10.3% increasing rate of older adults. This province was impacted by the increase amount of older adults. The enlarged group of this generation will be burden in each family, communities, and also in public health service. (Thitima Booncharean and et al. 2011) (The Health Security Organization. 2010) Aging society in community is a very important topic for whom who had their responsibility to take action to prepare for aging society in the community.

The research of health information of the older adults to prepare for aging society in community was to explore health information that need to take good health care of the older adults in community. These information is also need to prepare facilities and supports for long-term care in community and that would be benefit to use as way or policy to develop health promotion model for older adults in community in the future.
Review of Literature in Health information

Health was defined as being "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity". (The World Health Organization (WHO), 1948) This definition invited nations to expand the conceptual framework of their health systems beyond issues related to the physical condition of individuals and their diseases, and it motivated us to focus our attention on what we now call social determinants of health. Consequently, WHO challenged political, academic, community, and professional organizations devoted to improving or preserving health to make the scope of their work explicit, including their rationale for allocating resources. This opened the door for public accountability.

In 1986, the WHO, in the Ottawa Charter for Health Promotion, said that health is a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities." Classification systems such as the WHO Family of International Classifications (WHO-FIC), which is composed of the International Classification of Functioning, Disability, and Health (ICF) and the International Classification of Diseases (ICD) also define health.

Information was data represents values attributed to parameters, and knowledge signifies understanding of real things or abstract concepts. (Merriam-Webster dictionary) One of the most common ways to define information is to describe it as one or more statements or facts that are received by a human and that have some form of worth to the recipient. Information is valuable because it can affect behavior, a decision, or an outcome. Information is data that is accurate and timely, specific and organized for a purpose, presented within a context that gives it meaning and relevance, and can lead to an increase in understanding and decrease in uncertainty. (Business dictionary, 2016)

Information is data that has been processed in such a way as to be meaningful to the person who receives it. Note the two words highlighted in red - "processed" and "meaningful". It is not enough for data simply to be processed.

Health information for older adults is data represent the health data for older adults that include

1) Demographic data: age, sex, status, numbers of children, working.
2) Health information data: health care need, health care services, health care support, and other support from the government.

Objective of the research were to explore health information of the older adults to prepare for aging society.
Definition of terms

- Health information data represents health that need for older adults.
- Older adult in community: older than 60 years old people who are living in the community.
- Aging society: the community that had older adults more than 10 percent of all population.

2. Materials and Methods

The research design were mixed method that used both quantitative and qualitative research design. The research methodology were using descriptive data survey and in-depth interview explore the information of older adult.

Research Framework

![Research Framework Diagram]

The population of this research were the older than 60 years old older adults in Nakhon Sawan province. The samples were 380 older adults selected by multistage random sampling from 5 districts that were the top 5 high older adult population in Nakhon Sawan province, Thailand.

The instrument of this research was the demographic data and health information questionnaire of the older adults. The instrument was pass the content validity was at .76 and the Cronbach’s alpha reliability coefficient were at .86.
The data collection and analysis

Step I:
1. Prepared completely instruments.
2. Planned and dated older adults clubs in community.
3. Collected data and edited completely instruments.
4. Qualitative data analysis by computer program such as frequency, percentage.

Summary the research finding.

Step II:
1. Planned and dated stakeholder in community.
2. In-depth interview to explore the health care need that necessary for older adults in the community.
3. Qualitative data were analyzed by using content analysis.
4. Summary the research finding, discussion and conclusion.

3. Results

The finding of this research shown in 2 data information, the first information described demographic data of the older adults and the second information described health information.

The demographic data were age, sex, status, numbers of children, working. The finding was shown as following Table 1.

Table 1 The demographic data information

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>61-69 years old</td>
<td>125</td>
<td>32.9</td>
</tr>
<tr>
<td>71-79 years old</td>
<td>217</td>
<td>57.1</td>
</tr>
<tr>
<td>&gt;80 years old</td>
<td>38</td>
<td>10.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sex</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>169</td>
<td>44.5</td>
</tr>
<tr>
<td>Female</td>
<td>211</td>
<td>55.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Status</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>42</td>
<td>11.1</td>
</tr>
<tr>
<td>Marriage</td>
<td>309</td>
<td>81.3</td>
</tr>
<tr>
<td>Widow/Separated/Devote</td>
<td>29</td>
<td>7.6</td>
</tr>
</tbody>
</table>
From table 1, the demographic data shown that the older adults were at age between 71-79 years old (57.1%) and 61-69 years old (32.9%), most of them were female (55.5%) and 44.5% were male. 81.3% of them were marriage with 73.2% had 1-3 numbers of children. The older adults in the community were still working as agriculture (48.4%), did not work, stay home (29.5%).

The health information were health status, Body Mass Index (BMI), smoke and alcohol drink behavior, Health promotion behavior, life satisfaction and health care need. The finding was shown as following Table 2.

Table 2 Health Information

<table>
<thead>
<tr>
<th>Health status</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>12</td>
<td>3.2</td>
</tr>
<tr>
<td>Fair</td>
<td>85</td>
<td>22.4</td>
</tr>
<tr>
<td>Moderate</td>
<td>226</td>
<td>59.4</td>
</tr>
<tr>
<td>Good</td>
<td>42</td>
<td>11.1</td>
</tr>
<tr>
<td>Very good</td>
<td>15</td>
<td>3.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Body Mass Index (BMI)</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skinny (BMI&lt;18.50)</td>
<td>31</td>
<td>8.2</td>
</tr>
<tr>
<td>Normal (BMI=18.50-22.90)</td>
<td>43</td>
<td>11.3</td>
</tr>
<tr>
<td>Level 1 obesity (BMI=23-24.90)</td>
<td>153</td>
<td>40.3</td>
</tr>
<tr>
<td>Level 2 obesity (BMI=25-29.90)</td>
<td>129</td>
<td>33.9</td>
</tr>
<tr>
<td>Level 3 obesity (BMI&gt;30)</td>
<td>24</td>
<td>6.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Smoke and alcohol drink</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not smoke and drink</td>
<td>262</td>
<td>68.9</td>
</tr>
<tr>
<td>sometime</td>
<td>86</td>
<td>22.7</td>
</tr>
<tr>
<td>often</td>
<td>32</td>
<td>8.4</td>
</tr>
</tbody>
</table>
From table 2, the health information were health status were at moderate (59.4%), fair (22.4%). Body Mass Index (BMI) were at Level 1 obesity (40.3%) follow with Level 2 obesity (33.9%). Most of them did not smoke and alcohol drink (68.9%) and some of them smoke and drink for sometimes (22.7%). Health promotion behavior in 6 aspects were at high level. The life satisfaction were at Level 7-8 (46.0%) and Level 5-6 (32.1%) in 10 scales.

This research also assessed health care need from in-depth interview of the older adults in community shown that their health care need were about health care support, health security, good medicine and treatment when they went to hospital. They also need health promotion topics such as physical and mental health promotion, personal health care, nutrition, exercise, sleep, rest, recreation, disease prevention. More financial support from government was one of the most important need of the older adults, it can help some poor older adults that did not still working to earn themselves with good quality of life.

Discussion

The research findings revealed that the demographic data shown that the older adults were at age between 71-79 and 61-69 years old. This finding was support by The Second National Plan for Older Persons, Thailand’s aging population is expected to increase to 17 million, accounting for 25 percent of the population by the year 2040. This means that out of every four Thais, one will be a senior citizen. Most of them were female, marriage and had 1-3 children were the basis of Thai community to live as the extended family who stay together 2-3 generation. The older adults in the community were still working as agriculture, did not work, stay home, most of the older adults in community usually still working in field or garden in the morning and go back to stay home in the afternoon. So they assessed their health status at moderate and fair, with Body Mass Index (BMI) were at Level 1 and Level 2 obesity.

<table>
<thead>
<tr>
<th>Health promotion behavior</th>
<th>Level of Health promotion behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health responsibility</td>
<td>High</td>
</tr>
<tr>
<td>Exercise</td>
<td>High</td>
</tr>
<tr>
<td>Nutrition</td>
<td>High</td>
</tr>
<tr>
<td>Relationship to the others</td>
<td>High</td>
</tr>
<tr>
<td>Spiritual</td>
<td>High</td>
</tr>
<tr>
<td>Stress management</td>
<td>High</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Life satisfaction</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1-2</td>
<td>9</td>
<td>2.4</td>
</tr>
<tr>
<td>Level 3-4</td>
<td>41</td>
<td>10.8</td>
</tr>
<tr>
<td>Level 5-6</td>
<td>122</td>
<td>32.1</td>
</tr>
<tr>
<td>Level 7-8</td>
<td>175</td>
<td>46.0</td>
</tr>
<tr>
<td>Level 9-10</td>
<td>33</td>
<td>8.7</td>
</tr>
</tbody>
</table>
Most of them did not smoke and alcohol drink or as some occasion, Thai people usually smoke and alcohol drink when they had a party or ceremony. Health promotion behavior in 6 aspects were at high level and life satisfaction were at Level 7-8 in 10 scales. This finding were support by Pender’s Health Promotion Model, health promotion is a process is concerned with positive health and well-being and aims to empower people to control their own health by gaining control over the underlying factors that influence health. The older adults is one of the most interesting group to apply to promote health because when people had increasing their old age, they trend to take care of their health.

The health care need shown that their health care need were about health care support, health security, good medicine and treatment, health promotion topics. Many research support this findings because when the older adults were ill, they usually had complex conditions, need many health care services, and require professional expertise that meets their needs. Most providers receive some type of training on aging, it includes the work done in providing primary care, secondary care, and tertiary care, as well as in public health, but the percentage of those who actually specialize in this area is small. (Gorman, 1999)

4. Conclusion

The research of health information of older adults in community that explored health information from 380 older adults selected by multistage sampling in Nakhon Sawan Province. The instrument was the Demographic Data and Health Information Questionnaire of the older adults such as age, sex and health information. The quantitative data were collected and analyzed by computer program. The qualitative data were analyzed by using content analysis.

The research findings revealed that the demographic data shown that the older adults were at age between 71-79 years old (57.1%) and 61-69 years old (32.9%), most of them were female (55.5%) and 44.5% were male. 81.3% of them were marriage with 73.2% had 1-3 numbers of children. The older adults in the community were still working as agriculture (48.4%), did not work, stay home (29.5%). The health information were health status were at moderate (59.4%), fair (22.4%). Body Mass Index (BMI) were at Level 1 obesity (40.3%) follow with Level 2 obesity (33.9%). Most of them did not smoke and alcohol drink (68.9%) and some of them smoke and drink for sometimes (22.7%). Health promotion behavior in 6 aspects were at high level. The life satisfaction were at Level 7-8 (46.0%) and Level 5-6 (32.1%) in 10 scales. The health care need shown that their health care need were about health care support, health security, good medicine and treatment, health promotion topics and need more financial support from government.

Older adult persons are valuable resources who should pass on wisdom and experience to younger generations. People should be aware of the importance of older
persons, so that they should receive greater opportunities to make use of their knowledge and experience in working for society.

5. Acknowledgement

Thank you Faculty of Science and Technology, Nakhon Sawan Rajabhat University that support research fund and opportunity to research. Thank you research team and anyone related in this research. Thank you my family that support inspiration and empowerment to work hard for this research

Limitation and further research

The research findings were a part of the total research. The next steps is to complete the health promotion model development in older adults to prepare for aging society. Using older adults program development to improve knowledge, attitude, and practice for older adult health care. The seminar of the older adults and the focus group discussion of stakeholder who work related to older adults will take place and assess the model of health promotion in older adults. Although this finding is a part of this total research but the health information from the first step of this research can be used for further strategic planning for aging society in community.

6. References


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Abstract

The need to irrigate agricultural land efficiently, economically and sustainably is critical for food security. Costs for irrigation using diesel power are rising. Solar radiation as a source of energy is of course, the epitome of the clean. Sustainable energy technology. Solar technology has very low environmental impacts. The environmental impacts of a solar system in operation are very low and the source is, for us inexhaustible. Solar irrigation solutions produce no emissions, generate no noise. Solar power for irrigation is more reliable than wind power. Pumps add energy to lift or move fluids from one point to another. Pumps are used in many different applications: industrial, domestic and agricultural. The choice of a pump to a specific application is a very important decision and will depend on the required demand, head, performance, maintenance, and cost. Solar pumps can also complement the design of drip irrigation systems, delivering water precisely and efficiently to individual plants. Very high volumes of water for large-scale irrigation can also be supported through a wide range of pump sizes and vertical lifts. Solar pumps, in general, can be classified as mechanical solar pumps and nonmechanical solar pumps. Water pumping in many applications is very important. Solar concentrating techniques make an opportunity for cheaper and more reliable pumping water. This paper designs procedures and guidelines for design solar water pumping system. These steps will help you ensure that the system functions properly and that water is supplied for the operation in the amounts and at the locations required.

Keywords: Solar, Water pumping, Agricultural Sector

1. Introduction

Solar energy is the radiant energy of the sun. Solar energy is a renewable energy. In the form of thermal energy, electrical energy, and lighting energy. Direct solar energy utilization. It is the primary energy source. The second approach is to be applied in the application of heat. And applications in the electrical, Which change solar energy into electrical energy. The
pump is needed to get used to the consumers and consumer households and in the agricultural sector. In order to meet the basic needs of food, water, and agriculture is regarded as important and very necessary for the country. The water pump is a vital tool which pumps used in the present are the kinds pumps, centrifugal pumps, seizures, submersible pump, but the pump is mainly used in households and in agriculture is a pump that works with AC power. Or used engine oil, etc. are used to drive the pump. Which has cost more due to the cost of electricity and fuel prices are rising. Farmers also need to find ways to deal with the long-term sustainability. Farmers in the area are making efforts in the pursuit of alternative energy can be a renewable-powered water pump. At present solar cells that can turn sunlight into electricity became popular and cheaper. It pumps water using electricity from solar cells have been the focus for the household sector. In times the past has designed and developed a range of solar water pumps. Bringing solar to the pump, there are many factors to consider, such as to pump water from the solar panels directly with the lottery. And without batteries The pump through an inverter or AC power. The pump is used direct current power, etc., each with different advantages and disadvantages. This is not the appropriate technical performance and economic value must also truly understand the source of our water is pumped. Category and type of pump to use with solar cells. Water and high water levels we want to smoke. The size and design of the solar system that pumps water. All this make sense to keep the pump running efficiently and reduce costs as much as possible.

Solar water pumps were first introduced for water provision in off-grid areas. The technology has developed around many different designs and in some water pumps the reliability and maintenance requirements have improved over the initial pumps introduced to the market. Solar pumps are easy to install, require no nonrenewable energy, operate autonomously and are generally “good” for the sustainability of boreholes due to their low extraction volumes spread over eight to ten hours a day. The initial capital cost is high due to the cost of the photovoltaic modules. The maintenance requirements differ and range between annual and five year maintenance intervals. A perceived limiting factor of solar pumps is that they do not easily cater for fluctuating water demands or increased water demand although solutions for this are being offered. (Amit Desai, 2012)

2. Components of the System

A Components of Solar Water Pumping (Figure 2-1) typically consists of three the following, Photovoltaic array, Controller, and Water pumping.
2.1 Photovoltaic Array

If photovoltaic panels are made up of individual photovoltaic cells connected together, then the Solar Photovoltaic Array, also known simply as a Solar Array is a system made up of a group of solar panels connected together. A photovoltaic array is, therefore, multiple solar panels electrically wired together to form a much larger PV installation (PV system) called an array, and in general the larger the total surface area of the array, the more solar electricity it will produce.

2.2 Controller

An electronic device which matches the PV power to the motor and regulates the operation, starting and stopping of the PVP. The controller is mostly installed on the surface although some PVPs have the controller integrated in the submersible motor-pump set.

2.3 Water Pumping

The pump moves the water from a source to its delivery point. It needs to be powerful enough to move the necessary volume of water the required distance and under pressure also.

Water Pumping Motors

1. Alternating Current (AC) Motors: require inverters to convert direct current to alternating current. Solar pumping systems employs electronically controlled variable-frequency inverters to optimize matching between the panel and the pump.

2. Direct Current (DC) Motor: The DC Motors with permanent magnet are generally more efficient. DC Motors may be with or without carbon brushes. DC motors with carbon brushes need to be replaced after about every 2 years. Brushless DC Motors, which require electronic commutation, are becoming popular in the solar water pumps.

Main solar water pumping technologies

1. Centrifugal Pump: uses high-speed rotation to suck in water through the middle of the pump. Most AC pumps use such a centrifugal impeller.
2. Positive Displacement Pump: The positive displacement pump is currently being used in many solar water pumps. The pump transfers water into a chamber and then forces it out using a piston or helical screw.

3. Comparing different pumping technologies suggest that positive displacement pumps generally pump slower than centrifugal pumps but have good performance under low power conditions and achieve high lift. However, when operating at low power, the performance of the centrifugal pump drops dramatically.

Types of Pump
1. Surface Pump: Placed besides the water source (lake, well, etc.).
3. Floating pump: Placed on top of the water.

3. Designing a solar water pumping system

There are many aspects of designing a solar water pumping system. This guide provides the information to correctly. The following steps need to be followed to design a system for water pumping applications.

3.1 step 1 – Site Assessment

A site assessment involves gathering accurate information about your farm daily water requirements, the site’s historical solar resource, possible water sources and the water delivery point. Information typically required by solar pump suppliers includes:

1. Water requirements: The first thing to consider when designing a solar water pumping system is to determine the water requirements. This can be done in part by using the average water requirement values for values crops and livestock. This requirement differs depend on the location.

2. Water resources: The water resource available at a site needs to be assessed so that a suitable source can be selected for the solar pumping system. Many types of water source can be considered. The most common are dams, bores, marshy, rivers and creeks. Each source has characteristics that need to be considered when planning a pumping system. If the water source is a well, the following items will need to determine the properties of the source. Important factors to consider are: static water level, dynamic water level and quality of water.

- Static water level is the level at which water stands in a well. A measuring point should be specified for measurements. Negative values of static water level below ground level. This can be measured when there is no pumping from the source and the water is given time to be refilled.

- Dynamic water level is the level when water is being drawn from the well. The cone of depression occurs doing pumping when water flows from all direction toward the pump.
- The quality of water is measured by several factors, such as the concentration of dissolved oxygen, bacteria levels, the amount of salt, or the amount of material suspended in the water. In some bodies of water, the concentration of microscopic algae and quantities of pesticides, herbicides, heavy metals, and other contaminants may also be measured to determine water quality.

3. Water delivery: The location to which the water will be pumped to (such as a storage tank or dam, directly to troughs, or to drip irrigation), o the vertical lift between the pump and the water delivery point, and o the length of the route between the pump and the water delivery point.

3.2 step 2 – Solar Insolation and PV Panel Location

To design a solar-powered water pump system, you will need to quantify the available solar energy. Solar insolation is a measure of solar radiation energy received on a given surface area in a given time. In the case of photovoltaics, the object or surface that solar radiation strikes may be a planet, a terrestrial object inside the atmosphere of a planet, or any object exposed to solar rays outside of an atmosphere, including spacecraft. Some of the solar radiation will be absorbed, while the remainder will be reflected. Usually, the absorbed solar radiation is converted to thermal energy, causing an increasing in the object’s temperature. Some systems, however, may store or convert a portion of the solar energy into another form of energy, as in the case of photovoltaics or plants. The amount of insolation received at the surface of the Earth is controlled by the angle of the sun, the state of the atmosphere, altitude, and geographic location. And the potential of solar energy throughout the year in Thailand. (Figure 2.2)

![Figure 2 An average of the potential of solar energy throughout the year in Thailand](image-url)
3.3 step 3 – Water Flow Rates and Delivery Point Pressure

The entire system, including the panels, pump, pipe, and storage tank, must be analyzed to ensure that the design flow rates can be delivered point at the required pressure in order to properly operate the valves.

The required daily flow rate determines the size of the pump required as well as the size of the solar array that will be needed to power the pump.

Solar radiation levels can vary substantially from one day to the next. On some days, there will be less solar power generated to pump the required water, while on other days, excess solar power will be produced and additional water will be pumped.

The design flow rate for the pump is calculated by dividing the daily water need of the operation by the number of peak sun hours per day.

3.4 step 4 – Calculating the Total Dynamic Head (TDH) for the Pump

The TDH for a pump is the sum of the vertical lift, pressure head and friction loss.

Vertical lift is the vertical distance between the water surface at the source and the water surface in the tank. The water level in the source can change depending on season and usually change when the pump is running.

Pressure head is the pressure at the delivery point in the tank. If the delivery point is on the top of the tank, this parameter can be set to 0.

Friction loss is the loss of pressure due to the friction of the water as it flows through the pipe. Friction loss is determined by four factors: the inside diameter of the pipe, the flow rate, the length of the pipe, and the pipe’s roughness.

3.5 step 5 – Pump Selection and Associated Power Requirement

The pump can be selected by comparing the design flow rate and TDH calculated in Steps 3 and 4 with the information from the manufacturer’s pump curves. Solar pump manufacturers generally present their pump selection information in one of two ways.

1. Pump performance curves: All pumps have a characteristic or performance curve that describes the flow rate produced at net or total head. Pump specifications relating head and flow rate correlate to those found on its characteristic curve. The system curve illustrates the required head for different flow rates in the system. It is constructed using a form of Bernoulli’s equation for fluid mechanics, which is beyond the scope of this guide. Generally, more head is required as flow rate increases due to frictional forces and other losses in the system. (Figure 2.3)
Figure 3 Pump performance curves

2. Pump/array performance tables: These tables usually have solar energy listed at the top, head on the left and the flow rate for each combination. For a solar array of a particular size, the possible head heights of each pump can be determined. The maximum flow rate for each combination can then be ascertained.

3.6 step 6 – Solar Panel Selecting and System Layout

The PV panel selected for this system must be able to provide the minimum energy requirement to run the pump. However, the panels must also have additional capacity to account for any potential reduction in power due high heat, dust, age, etc. The variability of solar radiation levels means that the power output of the array will vary throughout the day. This is particularly the case when you’re running a centrifugal pump, which can have significantly different efficiencies when operating at different power levels. Many PV manufacturers recommend increasing the minimum peak power value by 25% to account for these environmental factors. And determine the layout of the entire system, including the locations and elevations of the following components: Water source, Pump, PV panels, Storage tanks, Points of use, and Pipeline routes.

3.7 step 7 – System Installation and Commissioning

The PV panels selected for this system must be able to provide the minimum energy requirement to run the pump. However, the panels must also have additional capacity to account for any potential reduction in power due high heat, dust, age, etc. Many PV manufacturers recommend increasing the minimum peak power value by 25% to account for these environmental factors. And there are many options for panel foundations. Concrete piers are the most common due to their basic design and adaptable nature. Digging holes and setting posts in concrete is straightforward, and piers can almost always be installed without rebar reinforcements. Once you have your system design and foundation strategy, you can lay out and mark post locations. Common methods for marking out foundation locations include wood stakes, string, and marking paint.
3.8 step 8 – Summary of the System

When the design is finished, a summary of the whole system should be made. That includes the following information: All system components and their specifications, System operating characteristics, and Special considerations required in the system design.

4. Conclusion

The Water pumps are an important tool in the lives and careers in the field of agriculture in rural areas that are far away, no electricity. The pump is mainly used in AC current system. Or engine-driven pump to pump work in agriculture. The rising costs of fuel price increase. The need for energy alternatives to replace oil and electricity. Therefore, the use of solar energy is used to pump water. But considering the use of the solar water pumping. There are many factors, such as water resources, water consumption. Choosing solar cells, the amount of sunlight to choose the right pump. These factors are summarized in this 8-step process for the design of solar pumping system suitable for use in the agriculture sector.

5. References

The Effectiveness of Using Different Representative in Online Learning on Self-Regulated Learning and Execution of Team Project

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Abstract
The objective of this research was to investigate the effectiveness of using anonymous agents and personal identifiable agents on the motivation and learning strategies and the execution of team projects. According to Zimmerman (1989), they define the self-regulated learning in terms of self-generated thoughts, feelings, and actions, which are systematically oriented toward attainment of students' own goals while Anonymity refers to nameless and hide the identity. The samplings were 451 Nakhon Sawan Rajabhat University pre-service teacher students. The MSLQ and Team Learning Evaluation Form were research instruments for collecting data. The quasi-experimental research method was used. The Multiple Linear Regression was used to determine the success factor in projects. The result shows the used of anonymous agents and identifiable agents in Computer-Supported Collaborative learning (CSCL) were affected the student learning and team projects execution. The discussion, conclusion, and future research were described in this paper.

Keywords: Self-Regulated learning, Anonymity, MSLQ, Motivation, Learning Strategies, CSCL

1. Introduction
In Thailand, according to Saekow and Samson (2011), the Thai government developed a strategic plan for the implementation of information and communication technology plan (ICT plan) in education in 1990 to the present day which aims to implement the technology to enhance the quality and increase the efficiency of education. Regarding this plan, the Ministry of Education (MOE) has pushed forward a policy to support the use of ICT in education projects, including IT connectivity with high quality digital learning and teaching materials. The project called “Thailand Cyber University (TCU)” project is one of e-Education project. Laohajaratsang (2010) stated that e-Education includes life-long learning, computer literacy, human resource development, virtual education, creation of useful information, contents and knowledge etc. as it showed in the ICT plan. The ICT can be a useful tool to improve the quality of teaching and learning because ICT can support a new way of learning such as
student-centered approaches and therefore enable students to learn in a meaningful way (Law, Pelgrum, and Plomp, 2008).

Based on recent study of the readiness for developing e-Learning in Thai universities, it was found that most Thai institutions (93%) have already started e-Learning (Laohajaratsang, 2008) and more than 75% expressed their readiness to accommodate e-Learning. The implementation of e-Learning technology among higher educational institutes is adequate and ready to serve university personnel and students (NECTEC, 2008; Komlayut and Punnakan, 2009). However, a recent research indicated problems in e-Learning development in Thai higher educational institutes were instructors, students and technical staff in terms of instructors and students being reluctant to use e-Learning, and insufficient technical staff to facilitate instructors when integrating eLearning into their teaching (Laohajaratsang, 2006; Komlayut and Punnakan, 2009).

Thailand is a country with very unique, strong cultural traditions and peoples have largely Buddhist religious beliefs (Pagram and Pagram, 2006). Copying the implementation of eLearning styles from overseas countries (mostly in Western countries) may not be suited to Thai students and more importantly, inappropriate e-learning styles may affect Thai culture through influencing the values of the new generation (Pagram and Pagram, 2006). Students in Thailand do not want to show off even they know or do not know because they afraid in loosing face if they answer incorrect so that why they always listen to their teachers. Moreover, the social dimension is also significant because motivation and belief play important roles in learning which consists of the reflection of members’ motivation, understanding, and learning. As a result, the ICT can help in teaching and learning when the eLearning designer design eLearning course or program by helping student feel comfortable in study (Pagram and Pagram, 2006).

The term Computer-Supported Collaborative Learning (CSCL) focuses on how technology can facilitate the sharing and creation of knowledge through peer interaction and group learning process (Resta and Laferriere, 2006). The main objective of CSCL is to provide an environment or situation that supports collaboration among students in order to enhance their learning process and to facilitate collective learning or group cognition. Also, CSCL involves new technological tools and constructivist approach to teaching and learning, thereby creating effective learning environments (Aharony, 2008). It is recognized that the use of Information and Communication Technology (ICT) such as CSCL is able to offers many features and opportunities to encourage student learning which are not available in traditional ways of classroom teaching.

However, studying in a distributed Web-based environment can be problematic for group learning or team projects as students in the online environment may not be working at the same pace and at the same time. Another challenge for the online community is the issue of trust. The lack of face-to-face interaction may result in the loss of identity and affect the
level of trust within the community. This makes the students unwilling or reluctant to share their knowledge and collaborate with others. In particular, this will affect development of team projects and the general performance of the team. One way to maintain the level of learner engagement is to use a character in the form of an agent or avatar to represent the learner online. For example, some companies have found by using avatars, they can combine both face-to-face training and computer-based learning with good results. Using avatars in computer-based training programs can be cheaper in the long run and more efficient than human trainers as the content and delivery will be more consistent. Sheth (2003) stated that one of the advantages of using avatars is their ability to offer learners a more engaging and memorable experience, encouraging higher adoption and usage rate through improved results.

The use of Information and Communication Technology (ICT) in education has emphasized emotional and cognitive process in the acquisition and development of knowledge and specific competences (Dellit, 2001). In order to acquire and develop students’ competence in a disciplinary area, student should have a solid base of verified knowledge, understanding of facts and ideas in the context of a conceptual construction, and the ability to organize their knowledge in a way which will facilitate retrieval and application. The metacognition is an aspect of students’ learning strategies within the theory of Self-Regulated Learning (SRL). Metacognition could help students to define their goals and objectives, to monitor their learning process, and to evaluate their progress. Moreover, students need the opportunity to learn in depth and through comprehension of a topic in order to transform basic information into usable knowledge (Succi and Cerbo, 2005). Moreover, on the challenges in teaching and learning is how to effectively communicate course materials to students in the most appropriate way. It is desirable that the learning materials should be clear and concise. In addition, they should be informative as regard to all the activities and how they are related to the student’s study. Ideally, from the students’ perspective, the learning process and experience should be enjoyable so that it could lead to effective communication and learning (Kilie-Cakmak, 2010).

In educational psychology point of views, constructivism helps learner to achieve in learning and has an important role in cognition development. It affects knowledge and cognition processing that involves thinking in creation and repository data, investigation and recalling knowledge (Livington, 2005). Also, constructivism improves learning and develops knowledge ability such as enhancement of ideas, values, and behaviors (Gama, 2000). On the other hand, behaviorists consider the mental state of learner, and they do not believe teaching should be directed toward strengthening the mind only (Thompson, Simonson, and Hargrave, 1992). Some behaviorists such as Skinner, believed that there were two types of learning. First, it was Pavlov’s classical conditioning that when a stimulus was applied to an organism to produce a response, there was a transfer of stimulus from one to another. The second was the operant conditioning that used reinforcement to promote desirable changes in behavior.
For example, a science teacher might require student participation in laboratory exercises in order to learn practices on laboratory safety and dangers of chemical reactions (Thompson et al., 1992). Behaviorism can be used as the basis to describe how learning occurs in situations where teachers provide learners with new information to be memorized and repeated, without the need for the students to make sense of the information or knowledge that they were given (Chansilp, 2003). This may not be the most effective means of learning.

On the other hand, constructivism is an alternative learning theory which argues that learners will become more active participants in constructing meaning and knowledge through experience, rather than through passive reception of information (Lorbach and Tobin, 1997). The question of how to adopt a constructivist approach into Web-based or online learning has been actively studied during the past two decades (Casas, 2006). A constructivist approach to learning focuses on the development of problem solving and thinking skills. Within the context of e-learning, the implementation of constructivist approach requires students be exposed to complex activities such as engagement and reflection, annotation, question and answer, elaboration and discussion, inquiries, problem solving, linking, construction, analysis, evaluation, and synthesis of knowledge (Oberlander and Talbert-Johnson, 2004; Gueldenzoph, 2003; and Berge, 1999).

Based on the above, it is hypothesized that using anonymous characters in a Computer-Supported Collaborative Learning (CSCL) environment may facilitate knowledge sharing and management, based on psychological aspects such as constructivism and behaviorism. This study will investigate the effectiveness and efficiency of human-machine-human communication and how students may learn through advanced technology across the barriers of space and time. It will be useful if such approach is proven that it is able to assist the students to overcome the barriers and to enhance student’s learning practices and strategies in individual and team learning.

An understanding of anonymous avatar in Computer-Supported Collaborative Learning (CSCL) in influencing students’ motivation and learning strategies and creation of team learning in project development can assist the E-Learning developer, educator and researcher in using ICT in distance education or instructional technologist in business setting to design and develop the suitable environment and activities in Computer-Supported Collaborative Learning (CSCL) Environment. This study focuses on the psychological aspects such as behaviorism and constructivism theory, web technology as the development of Computer-Supported Collaborative Learning (CSCL), using anonymous and avatar in education, team learning, and the project-based learning will use as the teaching method to develop and plan for learning activities in each step of study because both control and experimental group have to study in the same environment on the web but different representative to produce project. The advanced of communication and computer technologies offer the opportunities for people to present themselves on virtual environment by anonymous and be physically
separated from each other while interacting with each other within this environment. The idea of anonymity on the internet means that the real author of a messenger is not shown (Palme and Berglund, 2007). Blau and Caspi (2008) found that in an online environment may enhance students’ participation. In addition, visual anonymity and isolation from other students may decrease fear of criticism, which consequently both enhances participation and lead to a more risky behavior. It is related to the Social Identity model of Deindividuation Effects (SIDE) theory which claims that anonymity induces a shift in an individual’s focus from their personal identity toward their social identity as a member of a group. Also, visual anonymity combined with salient group identity increase the adherence to group norms and causes greater attraction on the groups’ member (Blau and Caspi, 2008). Hooper, Pollanen and Teismann (2006) found that the anonymity of the online office hour sessions for Mathematics course by using enVision communication software (freeware which is real-time communication of complex mathematical ideas) as a key factor in helping to relieve their anxiety, allowing some students to more actively participate in the discussion while others could choose a more passive role and still gain from the session.

A common variety used of anonymity is pseudonymous where the other name than real name is shown and it is a component of deindividuation (Palme and Berglund, 2007). According to Lu and Bol (2007) who conducted research related to anonymous and identifiable e-peer review on college student writing performance and critical feedback, suggest that the use of anonymous peer review can promote critical feedback and improving writing performance of college students and lead to greater improvement of student written work. Moreover, the anonymous or anonymity also help student in showing opinion that showing their identity that is lead to the communication and peer in group. Moreover, the anonymous may encourage engagement and interaction. In addition, web technology has moving from Web 1.0 to Web 4.0 and so on which make the most intrinsic advantage of platform that delivering software as a continually updated service, consuming and remixing data from multiple sources, including individual users while providing their own data and services, and also allow users to interact to others. The uses of Web 2.0 for learning environment, users are not only using the internet but they are also creating and uploading the content. They also purpose the model of Web 2.0 for learning environment and knowledge management under the Web 2.0 that there is, first, the Collaborating Space where learner can get collaboration with their partners, second, the Knowledge Sharing Space where they can exchange their knowledge, and last is the Virtual Community where is dynamic and integrates rich resource from learners to collaborate and share the knowledge. The using Web 2.0 Technologies in learning environment and knowledge management in term of collaborating, knowledge sharing and virtual community may use Blogs, Wiki, ePortfolios, RSS, Podcasting, Instant Message, File Sharing, for instance.
2. Method

This research study utilized data from students who enrolled in 1131701 Computer and Information Technology for Teachers at Nakhon Sawan Rajabhat University, Thailand. The research design for the study was quasi-experimental pre-test/ post-test design for the dependent variable, using an experimental group of 1131701 Computer and Information Technology for Teachers students who took part in using anonymous agents class activities and a group of students who took part in using pictorial representations. The study look for statistical differences between groups in each scale of Pintrict’s self-regulated model and team collaboration.

Research Framework

The research design is the conceptual structures within which research is conducted such as the arrangement of conditions for collection, measurement, and analysis of data (Selltiz, Wrightsman, and Cook, 1962). Research design is needed because it helps in facilitation the various research operations and making research possible. Moreover, research design stands for planning of methods which to be adopted for data procedures. In fact, a good research design (flexible, appropriate, efficient, and budget plan) will help researchers in planning, conducting, and collecting data. There were three types of research methods: historical research, descriptive research, and experimental research (Wongrattana and Naipipat, 2008).

The important of experimental research is to answer the research questions and control extraneous variance (Wongrattana and Naipipat, 2008). Gay (1992) states that “the experimental method is the only method of research that can truly test hypotheses concerning cause-and-effect relationship its represents the most valid approach to the solution of educational problems, both practical and theoretical, and to the advancement of education as a science” (p. 298) (Gay, 1992). Fisher (1960) states the advanced three principles of experimental research design were randomization, blocking, and replication. There are many setting such as natural and social setting, which researchers lack the fully control over the time of truly experiment. The method in which could help the experiment possible is quasi-experiments (Campbell and Stanley, 1963) It is oftentimes in educational studies research where the classes are formed at the start of the year, the research of this circumstance could be use quasi-experimental design as an option to conduct the research which for example to compare two similar classrooms in learning, attitude, or classroom behavior). The quasi-experimental research is used when researchers lack of the full control over the scheduling of experimental stimuli which makes a true experiment possible. There are many types of quasi-experimental research could be implemented to carry out the research for example, Nonequivalent Control Group, Time-Series Design, and Case Studies.
In this study, the quasi-experimental research design was employed to examine the effectiveness of anonymous agents in Computer Support Collaborative Learning (CSCL) among the students’ learning and the execution of team project which could be presented in the table below as the pre-experiment.

The research was experimented on Computer-Supported Collaborative Learning (CSCL). The Pre-test/Post-test were the Motivated Strategies for Learning Questionnaire (MSLQ) and Peer Evaluation Form. Moreover, the learning management plans for 8 weeks will use as the guideline in both groups (anonymous agents group and personal identifiable agents group) to make student use the same lessons, same activities, and same condition of evaluation.

Table 1 Appendix List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviations</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE</td>
<td>Pretest</td>
</tr>
<tr>
<td>POST</td>
<td>Posttest</td>
</tr>
<tr>
<td>AAS/ aas</td>
<td>Anonymous Agents with Completed Projects</td>
</tr>
<tr>
<td>AAF/ aaf</td>
<td>Anonymous Agents with Not Completed Projects</td>
</tr>
<tr>
<td>PIAS/ pias</td>
<td>Personal Identifiable Agents with Completed Projects</td>
</tr>
<tr>
<td>PIAF/ piaf</td>
<td>Personal Identifiable Agents with Not Completed Projects</td>
</tr>
<tr>
<td>LS/ ls</td>
<td>Learning Strategies</td>
</tr>
<tr>
<td>MO/ mo</td>
<td>Motivation</td>
</tr>
<tr>
<td>Peer</td>
<td>Team Collaboration</td>
</tr>
<tr>
<td>IGO</td>
<td>Intrinsic Goal Orientation</td>
</tr>
<tr>
<td>EGO</td>
<td>Extrinsic Goal Orientation</td>
</tr>
<tr>
<td>TV</td>
<td>Task Value</td>
</tr>
<tr>
<td>CLB</td>
<td>Control of Learning Beliefs</td>
</tr>
<tr>
<td>SE</td>
<td>Self-Efficacy</td>
</tr>
<tr>
<td>TA</td>
<td>Test Anxiety</td>
</tr>
<tr>
<td>Reh</td>
<td>Rehearsal Strategies</td>
</tr>
<tr>
<td>Elab</td>
<td>Elaboration Strategies</td>
</tr>
<tr>
<td>Org</td>
<td>Organization Strategies</td>
</tr>
<tr>
<td>CT</td>
<td>Critical Thinking Strategies</td>
</tr>
<tr>
<td>MC</td>
<td>Metacognitive Strategies</td>
</tr>
<tr>
<td>TSE</td>
<td>Time and Study Environment Strategies</td>
</tr>
<tr>
<td>ER</td>
<td>Effort Regulation Strategies</td>
</tr>
<tr>
<td>PL</td>
<td>Peer Learning Strategies</td>
</tr>
<tr>
<td>HS</td>
<td>Help Seeking Strategies</td>
</tr>
<tr>
<td>Comm</td>
<td>Communication</td>
</tr>
<tr>
<td>RB</td>
<td>Relationship Building</td>
</tr>
<tr>
<td>CSS</td>
<td>Cohesion and Solution Satisfaction</td>
</tr>
<tr>
<td>POP</td>
<td>Perception of Outcome and Process</td>
</tr>
<tr>
<td>PC</td>
<td>Performance and Collaboration</td>
</tr>
</tbody>
</table>
3. Results

To accomplish the predictability of project execution (learning score of AAS, AAF, PIAS, and PIAF groups) by the elements underlying self-regulated learning (SRL), a multiple regression analysis was performed in which the motivation subscale (IGO, EGO, TV, CLB, SE, and TA), learning strategies subscale (Reh, Elab, Org, CT, MC, TSE, ER, PL, and HS), and team collaboration subscale (Comm, RB, CSS, POP, and PC) were entered as the predictor variables and project execution (learning score) were used as criteria to be predicted. The regression finding with regards to the predictability of learning scores which related to project execution by motivation, learning strategies, and team collaboration are summarized in Table 1.

Model 1. AAS  a. Predictors: (Constant), PC, EGO, TA, CSS, MC, PL, Reh, IGO, CLB, HS, Comm, Elab, SE,

        , RB, CT, TV, ER, TSE, Org, POP
b. Dependent Variables: Scores

Model 2. AAF a. Predictors: (Constant), PC, ER, CSS, EGO, TA, CT, IGO, PL, RB, Reh, Clab, ELA, TSE, HS,

        , Comm, TV, SE, MC, Org, POP
b. Dependent Variables: Scores

Model 3. PIAS a. Predictors: (Constant), PC, TSE, TV, CSS, MC, TA, Org, HS, RB, Reh, SE, PL, CLB, EGO,

        , ER, IGO, POP, CT, Comm, Elab
b. Dependent Variables: Scores

Model 4. PIAF a. Predictors: (Constant), PC, Elab, TA, CSS, CLB, IGO, Comm, HS, EGO, PL, ER, Reh, TSE,

        , CT, MC, Org, RB, TV, POP, SE
b. Dependent Variables: Scores

Table 1 provides the R, R^2 (R Square Change), F Change, df1, df2, Sig. F Change, and Durbin Watson, which can be used to determine how well regression model fits the data. The “R column” represents the value of multiple correlation coefficients which can be indicates the quality or level of the prediction of the dependent variable. The “R Square column” represents the R^2 value which is the proportion of variance in the dependent variable that can
be explained by the independent variable, from Table 4.16, the $R^2$ of AAS = .41, $R^2$ of AAF = .415, $R^2$ of PIAS = .777, and $R^2$ of PIAF = .383 which means that the motivation, learning strategies, and team collaboration explain 41% for AAS, 41.5% for AAF, 77.7% for PIAS, and 38.3% for PIAF of the variability of execution of team project (learning score). The equation of each agent was built in four forms as following:

$$Y = b_0 + b_1 \cdot X_1 + b_2 \cdot X_2 + b_3 \cdot X_3 + b_4 \cdot X_4 + b_5 \cdot X_5 + b_6 \cdot X_6 + b_7 \cdot X_7 + b_8 \cdot X_8 + b_9$$

Where $b_0$ is a constant values, $b_1, b_9$ referred to regression coefficients.

$$Y = b_0 + b_1 \cdot IGO + b_2 \cdot EGO + b_3 \cdot TV + b_4 \cdot CLB + b_5 \cdot SE + b_6 \cdot TA + b_7 \cdot Reh + b_8 \cdot Elab + b_9 \cdot Org + b_{10} \cdot CT + b_{11} \cdot MC + b_{12} \cdot TSE + b_{13} \cdot ER + b_{14} \cdot PL + b_{15} \cdot HS + b_{16} \cdot Comm + b_{17} \cdot RB + b_{18} \cdot CSS + b_{19} \cdot POP + b_{20} \cdot PC + b_{21}$$

Table 3 Results of multiple linear regression coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1. AAS (constant)</td>
<td>16.837</td>
<td>.075</td>
<td>.05</td>
<td>18.605</td>
</tr>
<tr>
<td>ER</td>
<td>.075</td>
<td>.035</td>
<td>.905</td>
<td>.495</td>
</tr>
<tr>
<td>2. PIAS (constant)</td>
<td>17.436</td>
<td>3.814</td>
<td>-.155</td>
<td>.064</td>
</tr>
</tbody>
</table>

**P<.001, *P<.05

Estimated Model Coefficients

1. Model of using anonymous agents with completed projects

$$\text{Execution of Team Project} = 16.837 + 0.075 (\text{ER})\text{ explained 41% of variance}$$

$$\left(R^2 = .41, F(20, 56) = 1.253, p > .05\right)$$

2. No estimated model of using anonymous agents with not completed projects

3. Model of using personal identifiable agents with completed projects

$$\text{Execution of Team Project} = 17.436 +(-0.155) (\text{EGO})\text{ explained 77.7} % \text{ of variance}$$

$$\left(R^2 = .777, F(20, 28) = 1.397, P > .05\right)$$

4. No estimated model of using personal identifiable agents with not completed projects

From Table 2 results of multiple linear regression coefficients, the unstandardized coefficients indicate how much the dependent variables varies with independent variables when all other independent variables are held constant. The “t” and “Sig.” column represent the statistical significance of independent variables. If $p < .05$, it means that the coefficients
are statistically significantly different to 0 (zero). According to Table Coefficients and estimated model coefficients, there are only 2 model of multiple regression were build which are model of students who using anonymous agents and completed projects (positive relationship) and model of students who using personal identifiable agents and completed projects (negative relationship). It may be concluded that the corresponding SRL characteristics contribute to predicting the execution of team projects in completed projects.

Since there is one predictor that returned significant values less than .05, ER ($B = .075$, $p < .05$) and a constant ($B = 16.837$, $p < .001$) in AAS group (anonymous agents and completed projects) is used to predict the execution of team projects. The regression equation is built in the form:

For AAS group: $\text{Execution of Team Project} = 16.837 + 0.075 \text{ (ER)}$

This means, for instance, if the learner who differed by one point on ER would be predicted to differ by 0.075 points in the execution of team projects.

For PIAS group (personal identifiable agents and completed projects), there is negative relationship occurred in this model ($B = -.155$, $p < .05$) and it is used to predict the execution of team projects. The regression equation is built in the form:

For PIAS group: $\text{Execution of Team Project} = 17.436 + (-0.155) \text{ (EGO)}$

This means, for instance, if the learner who differed by one point on EGO would be predicted to differ by 0.155 points in the execution of team projects.

In summary, the results of multiple linear regressions indicated that one out of twenty independent variables explained 41% of variance ($R^2 = .41$, $F(20, 56) = 1.253$, $p > .05$). ER ($B = .075$, $p < .05$) is significantly predicted the execution of team projects in AAS group, while also one of twenty independent variables explained 77.7% of variance ($R^2 = .777$, $F(20, 28) = 1.397$, $P > .05$). EGO ($B = -.155$, $p < .05$) gives significantly predicted in negative relationship to the execution of team projects in PIAS group.

**Discussion, Conclusion, and Future Research**

This study explored the effectiveness of using anonymous and personal identifiable agents in Computer Supported Collaborative Learning (CSCL) to facilitated students’ Self-Regulated Learning and team collaboration. The main results concerned that using anonymous agent could encouraged motivation and learning strategies and also enhanced team collaboration in team project execution. There were 13 groups taking part in anonymous agents completed team projects while 11 groups not completed. However, there were 7 groups taking part in personal identifiable agents completed team projects while 26 groups not completed.

The used of MSLQ was to evaluate SRL in term of motivation and learning strategies, and using peer evaluation for evaluation team collaboration. There was an interaction
between using different agents and execution of team projects in extrinsic goal orientation, critical thinking strategies, and help seeking strategies. Focusing on differentiation, there were different between using agents and execution of team projects on extrinsic goal orientation, task value, self-efficacy, rehearsal strategies, elaboration strategies, organizational strategies, critical thinking strategies, metacognitive self-regulation strategies, time and study environment strategies, peer learning strategies, help seeking strategies, communication, relationship building, cohesion and solution satisfactions, perception of outcome and process, and performance and collaboration. There were extrinsic goal orientation which is one motivation subscale encourage the success of projects in using personal identifiable agents, and effort regulation strategies which is one of learning strategies subscale encourage the success of projects in using anonymous agents.

**Motivation**

The multiple regression analysis showed the negative effect on extrinsic goal orientation of students in PIAS group. It may discuss that extrinsic goal orientation plays important role than intrinsic goal orientation in using personal identifiable agents which is when teachers would like students to learning face to face, they should encourage extrinsic goal orientation to be good approach to persuade learners participate and learned by project based learning in CSCL.

**Learning Strategies**

The multiple regressions analysis showed that an effort regulation strategy has positive affect on the completed team projects on AAS group. The effort regulation is the ability to maintain attention even in the presence of distractions (Pintrich et al., 1991). According to Chen (2002) who studied on SRL strategies and achievement in an introduction to information systems course, found that effort regulation was the learning strategy that led to achievement which students could handle distractions and could maintain on learning outcomes. This could be the used of anonymous agents help students in controlling their effort and attention when they facing uninteresting tasks because they felt very freely when they hided identity themselves. Thus, the effort regulation is they key success for using anonymous agents to success team projects when students are not afraid of the complexity of using anonymous agents, they will result in more satisfied and effective their team projects in CSCL.

The finding of this study indicates that the hypotheses proposed were partially supported. As the finding show some motivation subscales, learning strategies subscales, and team collaboration subscales were decreased. Moreover, some indications were showed such as there were no interaction between used of different agents toward the execution of team projects, and some variables have difference mean score among the groups. The building of equation from multiple regression analysis show the significant both positive effect in anonymous agents with completed team projects group and negative effect in personal
identifiable agents with completed team projects group. The future research will suggest as following:

1. Future research should find the explanation how anonymous agents and identifiable agents improve and not improve the SRL (motivation and learning strategies) and team collaboration in both completing and not completing team projects when using CSCL and project-based learning method. This will lead to use of qualitative method in conduction research.

2. In this study, there were 253 students dropped out from the experiment. The future research should address why they dropped out, it was the learning activities or it was the complicated they faced to use the representative.

3. In this study, the MSLQ was translated into Thai language. Although, the Thai language version of MSLQ was validity from experts (IOC) and using Cronbach Alpha measurement but it still to many questions which students have to answer it. Moreover, the students have one hour to answer to in both pretest and posttest. This may affect the answer so that in the future study researcher should give more time to students to read carefully and answer it.

As the above-mentioned, the study was conducted to investigate the effect of anonymous agents among SRL and team collaboration on CSCL learning environment and lead to complete team projects. The results indicated that used of anonymous agents improved SRL and team collaboration which SRL is main factors to help students completed team projects. In addition, it was expected that the results of this study may provide information to teachers in decide to use whether anonymity or identity in eLearning mode. Thus, the learning culture is very unique in Thailand. Students try to group team member by selected the clever students in their group because they think these people can help them completed the assignment. They should aware that learning is such something they have to learn much and pay attention too rather than waiting for clever friends. In NSRU where this research conducted, when lecture ask students to group in PIA mode many students try to find clever students to be in group because they knew who were participated in CSCL. In contrast, students in AA mode they do not care who were the member because it totally no identity. This will lead to modified AA method to help student learn without they fear of losing face and they will feel free to collaborate which may be more practical used for the current NSRU students in the future.

4. References


The Self-Regulated Learning and Team Learning Factors for Learning through Represented Agents in Online Learning

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Abstract

This paper was aimed to investigation the success factors in Self-Regulated Learning and team learning when students using anonymous agents for their represented in online learning environment. There were 451 pre-service teacher students in the Faculty of Education, Nakhon Sawan Rajabhat University enrolled in the unit 1131701 Computer and Information Technology for Teachers during the second semester of academic year 2011. Using of MSLQ and peer evaluation form was used to collect the data. Lisrel was used as statistically method. The results show the goodness-of-fit of the proposed measurement models, six indices were used, namely x2-square test, the goodness-of-fit index (GFI), the Root Mean Square Residual (RMR), the adjusted goodness-of-fit index (AGFI), the comparative fit index (CFI), the root mean square error of approximation (RMSEA). There were all items in three categories which were used to test were necessary to be as the factors in measurement the motivation, learning strategies and team collaboration. All items were accepted and will use to the next step of the study on the effectiveness of using anonymous agents in online learning on Self-Regulated Learning and project execution.

Keywords: Self-Regulated Learning (SRL), Team Learning, MSLQ, Motivation, Learning Strategies

1. Introduction

Over past three decades, Self-Regulated Learning (SRL) has become an important area in explaining academic success (Bembenutty, 2011). According to Zimmermann (2000) and Pintrich (2000), SRL consists of three sub processes: 1) Forethought, 2) Performance, and 3) Self-Reflection. Forethought involves cognitive and motivation which students control and monitor themselves, and manage the learning resources. Performance refers to the effects on students’ attention and action. Self-Reflection refers to the influence that students’ response to experience after the performance sub process. The implementation of eLearning in education allows students study and work on their assignments in anywhere, anytime, whenever and wherever they want (Schwieren, Vossen, and Westerkamp, 2006). Previous studies showed that learning in eLearning environment requires high self-regulated learning
skills (Niemi, Nevgi, and Virtanen, 2003). Dabbagh and Kitsantas (2005) study also claimed that it was difficult for learners if they have low SRL skills. Furthermore, to enhance student learning in eLearning environment, teachers should inform students what is necessary for successful learning so students will have the ability to perform tasks and cultivate the belief of self-efficacy and control the expectation of success (Pintrich, 2000; Zimmermann, 2000). To sum up, it is very important that in an eLearning environment, teachers should develop students’ SRL skills to improve student’s engagement in the learning process (Winnips, 2000). SRL also refers to the level which students are motivated to learn and the strategies that they can incorporate in order to meet their learning goals. Boekaerts (1997) proposed the guidelines to enhance SRL and they were: 1) teachers should motivate the students and to support students to connect their prior knowledge and new knowledge; 2) teachers should explain to students how to apply and practice self-regulated learning; and 3) teachers should change their roles from being an information deliverer in the class, to coaches and mentors, and 4) teachers should design project works that students may use SRL skills in their learning and working processes. With regard to team performance, Mathieu, Gilson, and Ruddy (2006) studied on the empowerment and team effectiveness. Their result showed the psychological aspects that affect team processes and outputs are: member attitudes, values, motivations, and cognitions. This supported the findings by Haslam (2004), which claimed that the key processes which linked the effective team performance are: interaction, information sharing, and communication.

**How students report themselves related to SRL?**

According to above theories, SRL in classes is advantageous to students because it is an integrated learning process in which students can control their own behavior, motivation, and goal setting to match their own learning objectives. Zimmerman (1989) and Schunk (1996) summarized the SRL theories by investigated four major theories: operant conditioning (OC), cognitive development (CD), social-cognitive theory (SCT), and information processing theory (IPT). Table 2.2 below describes the main features of SRL.

Table 1 SRL summary (Man-Chih, 2006)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>OC of Behaviorism</th>
<th>CD of Cognitivism</th>
<th>SCT</th>
<th>IPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key to learning</td>
<td>Reinforcement</td>
<td>Self-Regulation</td>
<td>Model and Observation</td>
<td>Mental Processing</td>
</tr>
<tr>
<td></td>
<td>(Learners will link their learning with the stimuli of environment)</td>
<td>(Learners will control over their thoughts, feelings, and actions)</td>
<td>(Learners will link their learning motivation, cognition, and environment)</td>
<td>(Learners will use metacognition: planning, monitoring, and evaluating to explain SRL and learning strategies)</td>
</tr>
<tr>
<td>Regulating process</td>
<td>Self-Monitoring</td>
<td>Observation</td>
<td>Self-Observation</td>
<td>Select</td>
</tr>
<tr>
<td></td>
<td>Self-Instruction</td>
<td>Emulation</td>
<td>Self-Judgment</td>
<td>Organize</td>
</tr>
<tr>
<td></td>
<td>Self-Reinforcement</td>
<td>Self-Control</td>
<td>Self-reaction</td>
<td>Rehearsal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Self-Regulation</td>
<td></td>
<td>Map</td>
</tr>
</tbody>
</table>
How to measure or evaluate SRL?

Pintrich, Smith, Garcia, and McKeachie(1991) proposed a self-report instrument, the Motivated Strategies for Learning Questionnaire (MSLQ), to assess college students’ motivation and their use of different learning strategies. There are two components in MSLQ, the motivation component and the learning strategies component (Pintrich, 1995) which consists of six sub-scales within the motivation and nine sub-scales within the learning strategies. Each of the subscales have a number of items as illustrated in Table 2 below.

<table>
<thead>
<tr>
<th>Scale</th>
<th>Subscale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Value Components</strong></td>
<td>Intrinsic Goal Orientation (IGO)</td>
</tr>
<tr>
<td></td>
<td>Extrinsic Goal Orientation (EGO)</td>
</tr>
<tr>
<td></td>
<td>Task Value (TV)</td>
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<tr>
<td><strong>Expectancy Components</strong></td>
<td>Control of Learning Beliefs (CLB)</td>
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<tr>
<td></td>
<td>Self-Efficacy for Learning and Performance (SE)</td>
</tr>
<tr>
<td><strong>Affective Components</strong></td>
<td>Test Anxiety (TA)</td>
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<tr>
<td><strong>Cognitive and Metacognitive Strategies</strong></td>
<td>Rehearsal (REH)</td>
</tr>
<tr>
<td></td>
<td>Elaboration (ELAB)</td>
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<td></td>
<td>Organization (ORG)</td>
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<td></td>
<td>Critical Thinking (CT)</td>
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<tr>
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<td>Metacognitive Self-Regulation (MC)</td>
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<tr>
<td><strong>Resource Management Strategies</strong></td>
<td>Time and Study Environment (TSE)</td>
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<td>Peer Learning (PL)</td>
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<td>Help Seeking (HS)</td>
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</tbody>
</table>

In motivation scales, the six subscales are as followed (Pintrich et al., 1991)

1. Intrinsic Goal Orientation (IGO) is students’ perception and general goals of the course. This refers to students’ perception of their reasons to participate in the class such as challenge, curiosity and mastery.

2. Extrinsic Goal Orientation (EGO) is students’ perception of their participation in the class with specific reasons such as grades, rewards, performance, evaluation by others, and competition.

3. Task Value (TV) refers to the student’s evaluation of the importance and usefulness of the tasks in which the students will have higher levels of involvement in the learning.

4. Control of Learning Beliefs (CLB) refers to students’ beliefs that their efforts to learn will result in positive outcomes.

5. Self-Efficacy (SE) refers to the expectancy which is related to task performance and the judgments about one’s ability to accomplish the task.
6. Test Anxiety (TA) refers to the worry and emotional feeling which disrupt student’s thoughts and performance.

In learning strategies, there were nine subscales as following (Pintrich et al., 1991);
1. Rehearsal (Reh) involves reciting or naming items from a list to be learned, or the encoding processes that a student integrates the information with prior knowledge.
2. Elaboration (Elab) helps students store information into long-term memory by building the connections of items to be learned.
3. Organization (Org) helps learners in selecting appropriate information and construct connections among the information to be learned using techniques such as outlining, clustering, and selection of the main ideas.
4. Critical Thinking (CT) refers to students apply previous knowledge to new situations in order to solve problems.
5. Metacognition Self-Regulation (MT) refers to the use of planning, monitoring, and evaluation to complete a task.
6. Time/Study Environment Management (TSE) refers to students manage and regulate their time and study’s environments using scheduling, planning, and management of their study time in order to complete their learning tasks.
7. Effort Regulation (ER) is the students’ ability to control their effort and attention because it regulates the continual use of learning strategies.
8. Peer Learning (PL) refers to the collaboration between students in completing the tasks. It has significant effects on students’ achievement.
9. Help Seeking (HS) is the ability of students to identify someone who is able to provide them with support or assistance.

According to Zimmerman (1989), SRL is the process of learners used in their learning which consist of three characteristics: internal motivation, metacognitive, and behavior. Bandura (1986) mentioned that SRL is the process when learners plan and control themselves such as self-observation, self-judgment process, and self-reaction to build and maintain their behavior and motivation. A main feature of SRL is metacognition which is referred to the awareness, knowledge, and control of cognition. There are three general processes that make up metacognition activities: firstly, planning such as goal setting and task analysis; secondly, monitoring for example tracking of one’s attention and questioning; and thirdly regulating such as adjustment of one’s cognitive activities (Pintrich et al., 1991). Another feature is the time and study environment. Besides the metacognition, students must be able to manage and regulate their time and their study environments which involve scheduling, planning and setting of the environment to do the class works (Pintrich, 1995; Zimmerman and Risemberg, 1997).

Bandura (1971) proposed the Social Learning Theory (SLT) and constructivism. This theory stated that human interacts with environment and learning occurs during the
interactions. This can be said that, when learners have the opportunity to interact with their peers, learning will develop through their interactions and it is called “Collaborative Learning”. Johnson and Johnson (1991) and Slavin (1983) stated that the concept of collaborative learning allows students to discuss and learn with their peers. Collaborative learning focuses on learning environment management in which students as members in a group can learn together in small groups. Collaborative learning allows students to learn together in a group while teachers change their roles to learning facilitators. They act to support the learners by providing learning resources, follow up learning process, and to encourage learners to think and do instead of just giving contents or direction. Learners are expected to develop critical thinking and the ability to acquire their own knowledge.

There were five elements in cooperative learning as proposed by Johnson and Johnson (1991).

1. Clearly perceived positive interdependence
2. Interaction between group member, helping, and recommendation
3. Individual accountability and personal responsibility
4. Small group skills (personal skills, respect, trust preparing, and expectation)
5. Improve the group processing

Based on the five elements above, teachers should manage learning environments which support student learning. The interaction between teachers and students, and, among the students are the key points in collaborative learning. Teachers have to declare the goals and rules of learning. When students learn together, they are expected to be accountable and be responsible in the group and interactions. The group learning process is aimed to assist the students to reach their study goals. Nowadays, collaborative learning offers the opportunity for students to learn and work together. They are not only being done in the traditional classroom, but in virtual form. Collaborative learning in virtual form allows students working in groups and produce their works in virtual platforms such the use of web, discussion forum such as Edmodo, and Prezi.

2. Collecting Data

There were 451 pre-service teacher students in the Faculty of Education, Nakhon Sawan Rajabhat University enrolled in the unit 1131701 Computer and Information Technology for Teachers during the second semester of academic year 2011. The sample groups studied in several majors such as, English, Social Studies, General Science, Thai, Mathematics, and Computer Education. All of the participants studied in the first year towards Bachelor Degree in Education (B.Ed.) and unit 1131701 Computer and Information Technology for Teachers was the core subjects of the Bachelor degree course in Education (B.Ed.). The next step was to assign the students into experimental and control groups. The selection methods was based on the participants’ academic performance of previous study (first semester), and the level of
computer skills. This is a normal process adopted in the unit for team assignment as each group was expected to have similar academic background and computer skills. The control group used personal identifiable agents (such as their own picture and identification) while experimental group used anonymous agents (nameless or non-identification) in representation. In both the control and experimental groups, they consisted of 4 to 5 members in each group. In situations when students dropped out or withdrew from enrolment, or if they no longer participated in the group after the fourth week the team size will be changed. In case the number of members in a group was less than 4 people, that group will be removed from research participation which mean that all test score will be removed. The MSLQ and Peer evaluation form were used as testing materials for collecting data from sample group and the test were used after experiment of students who completed all requirements.

**Motivated Strategies for Learning Questionnaire (MSLQ)**

The Motivated Strategies for Learning Questionnaire (MSLQ), is a self-report instrument designed to assess college students’ motivation and learning strategies. The motivation portion in the questionnaire used in this study consisted of 31 items for assess students’ goals and beliefs in the course they attended. The learning strategies had 31 items in regrading students’ use of cognitive and metacognitive strategies. In addition, 19 items focused on students’ management of time, resource, and task. Students were asked to rate themselves on seven point Likert scale from “not at all true of me (1)” to “very true of me (7)”. Table 3 lists these two portions and their subscales.

**Table 3 Components of MSLQ (Artino Jr., 2005)**

<table>
<thead>
<tr>
<th>Motivation Scales</th>
<th># of Items</th>
<th>Learning Strategies Scales</th>
<th># of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Intrinsic Goal Orientation</td>
<td>4</td>
<td>1. Rehearsal</td>
<td>4</td>
</tr>
<tr>
<td>2. Extrinsic Goal Orientation</td>
<td>4</td>
<td>2. Elaboration</td>
<td>6</td>
</tr>
<tr>
<td>3. Task Value</td>
<td>6</td>
<td>3. Organization</td>
<td>4</td>
</tr>
<tr>
<td>4. Control of Learning Beliefs</td>
<td>4</td>
<td>4. Critical Thinking</td>
<td>5</td>
</tr>
<tr>
<td>5. Self-Efficacy</td>
<td>8</td>
<td>5. Metacognition Self-Regulation</td>
<td>12</td>
</tr>
<tr>
<td>6. Test Anxiety</td>
<td>5</td>
<td>6. Time/ Study Environment Management</td>
<td>8</td>
</tr>
<tr>
<td>7. Effort Regulation</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Peer Learning</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Help Seeking</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Number of Items</td>
<td>31</td>
<td>Total Number of Items</td>
<td>50</td>
</tr>
</tbody>
</table>

MSLQ has been implemented for research in many countries in studies concerning motivation and learning strategies such as Australia, China, Japan, Taiwan, and Thailand. The research areas which have used MSLQ are students’ motivation and performance, motivation
and learning strategies towards learning achievement, Self-Regulated Learning and web-based learning, and teacher education. In this study, the MSLQ was translated into Thai language and tested for index of consistency and Alpha Cronbach test for reliability.

Peer Evaluation Form

To determine the team performance in this study, the Peer Evaluation form was adopted. Liu (2007) found that effective virtual teams consist of six factors: Relationship Building, Cohesion, Communication, Collaboration, Performance and Satisfaction. His results also showed that in Relationship Building, the instrument assessed team members’ level of agreement with their relationships according to the work of Lurey and Raisinghani (2001). The Cohesion factor determined the group dimension through socio-emotional process instead of individual attractions as illustrated by the work of Carron, Colman, Wheeler, and Stevens (2002). The Communication factor measured task process through relational communication as demonstrated in Burgoon and Hale’s (1987) study. The Collaboration factor focused on the team members’ collaboration on virtual community as examined by Montoya-Weiss, Massey, and Song (2001). Lastly, the Performance and Satisfaction factor considered the group attitude and satisfaction from working in the virtual team (Chidambaram, 1996). Based on the six components above, the research questionnaire was translated into Thai language and it was tested for Index of Consistency (IOC) and Alpha Cronbach test for reliability. SPSS was used to test normal distribution and explore the relationship. Lisrel was used to investigate the CFA.

3. Results

Test of normal distribution, CFA, and primary data analysis on Motivation, Learning Strategies, and Team Collaboration

An initial number of 451 students participated in the study. Not all of the students have completed all the instruments as required. 253 students were not included in the data analysis and they could be categorized into two groups. First group of 131 students were in the teams of which the number of members dropped below 4 as some have chosen not to participate after four weeks. Second group of 122 students were those who did not complete the MSLQ and Peer Evaluation Form. Results from the remaining 198 students were used for analysis purpose. The 198 students belonged to one of the four groups in the study: Group 1 (AAS), 57 students in the groups which used anonymous agents and they have completed their projects; Group 2 (AAF), 49 students were in the groups which used anonymous agents and they did not complete their projects; Group 3 (PIAS), 29 students in groups which used personal identifiable agents and they also completed their projects, and Group 4 (PIAF), 64 students who used personal identifiable agents but they did not complete their projects.

Test of normal distribution

The Kolmogorov-Smirnov test was employed to assess the normal distribution for all dependent variables (motivation subscales, learning strategies subscales, and team
collaboration subscales) for the use of anonymous and personal identifiable agents and the result is shown in Table 4.1. A p value above 0.05 indicates non-significance (p > .05) and normal distribution. There were four subscales on motivation and team collaboration which have small significance (p < .05).

Table 3 Test of normality distribution for motivation, learning strategies, and team collaboration by one sample Kolmogorov-Smirnov test

<table>
<thead>
<tr>
<th></th>
<th>Motivation/ Asymp. Sig</th>
<th>Learning Strategies/ Asymp. Sig</th>
<th>Team Collaboration/ Asymp. Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IGO = .248</td>
<td>Reh = .088</td>
<td>Comm = .013*</td>
</tr>
<tr>
<td>2</td>
<td>EGO = .102</td>
<td>Elab = .092</td>
<td>RB = .011*</td>
</tr>
<tr>
<td>3</td>
<td>TV = .101</td>
<td>ORG = .083</td>
<td>CSS = .254</td>
</tr>
<tr>
<td>4</td>
<td>CLB = .136</td>
<td>CT = .279</td>
<td>POP = .016*</td>
</tr>
<tr>
<td>5</td>
<td>SE = .235</td>
<td>MC = .267</td>
<td>PC = .068</td>
</tr>
<tr>
<td>6</td>
<td>TA = .027*</td>
<td>TSE = .548</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>ER = .074</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>PL = .064</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>HS = .101</td>
<td></td>
</tr>
</tbody>
</table>

*P < .05

Confirmatory Factor Analysis (CFA)

According to Hair, Black, and Babin (2010), Confirmatory Factors Analysis (CFA) assists researchers to test how well the theoretical pattern represents the actual data. CFA was used to test the adequacy of the measurement model. Figure 1 illustrates the results from the initial measurement model in the present study. The adequacy of the measurement models was evaluated on the criteria of goodness-of-fit, reliability, convergent validity and discriminant validity for both models and Table 4 shows the Goodness-of-fit Criteria.

Figure 1 CFA of Motivation, Learning Strategies, and Team Collaboration
Table 4 Goodness-of-fit indices in the initial measurement models

<table>
<thead>
<tr>
<th>Model Fit Indices</th>
<th>Criteria</th>
<th>Values</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X^2$/df</td>
<td>&lt;3.0</td>
<td>135.39/11</td>
<td>(Chin and Todd, 1995)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 = 1.18763</td>
<td></td>
</tr>
<tr>
<td>$X^2$ (Chi-Square)</td>
<td>P&gt;.05</td>
<td>.084</td>
<td>(Chin and Todd, 1995)</td>
</tr>
<tr>
<td>Goodness-of-fit index (GFI)</td>
<td>Near to .90</td>
<td>.94</td>
<td>(Schumacker and Lomax, 2010)</td>
</tr>
<tr>
<td>Root Mean Square Residual (RMR)</td>
<td>&lt;.05</td>
<td>.037</td>
<td>(Schumacker and Lomax, 2010)</td>
</tr>
<tr>
<td>Comparative Fit Index (CFI)</td>
<td>&gt;= .90</td>
<td>1.0</td>
<td>(Tatham and Black, 1998)</td>
</tr>
<tr>
<td>Adjusted Goodness-of-fit Index (AGFI)</td>
<td>&gt;.80</td>
<td>.91</td>
<td>(Hair, Anderson, Tatham, and Black, 1995)</td>
</tr>
<tr>
<td>Root Mean Square Error of Approximation (RMSEA)</td>
<td>&lt;.05</td>
<td>.031</td>
<td>(Hair et al., 1995)</td>
</tr>
</tbody>
</table>

4. Conclusion and Implementation

This study was to investigate the goodness-of-fit of the proposed measurement models, six indices were used, namely $X^2$-square test, the goodness-of-fit index (GFI), the Root Mean Square Residual (RMR), the adjusted goodness-of-fit index (AGFI), the comparative fit index (CFI), the root mean square error of approximation (RMSEA). Table 4 shows the goodness-of-fit indices in the initial measurement models. This means that all factors of motivation, learning strategies, and team collaboration could be used in this study. The confirmed factors analysis (CFA) was used to confirm the suitability of the motivation subscales, learning strategies subscales, and team collaboration subscales. The results show that all categories which were used to test were necessary to be as the factors in measurement the motivation, learning strategies and team collaboration. All items were accepted and will use to the next step of the study on the effectiveness of using anonymous agents in online learning on Self-Regulated Learning and project execution.

5. References


PROCEEDINGS

The 1st National & International Conference of Nakhon Sawan Rajabhat University
Understanding the Change of Localization in the 21st Century