Development of Flood Disaster Model through PAIC Process

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Abstract

The integrative research was done with participatory action research with Participatory Appreciate-Influence-Control technique (PAIC) and qualitative research with focus group discussion. The sample was selected according to purposive sampling technique. The PAIC was implemented with 38 community leaders who came from community that faced with flood disaster in 2011 from Kuntarawichai District in Mahasarakham Province with brain storming integrated in focus group discussion during the training process. During training, Three Dimensional Evaluation (TDE) covers Self-evaluation, Friend-evaluation, and Facilitator-evaluation. One -Way-ANOVA, and Paired t-test were used for data analysis. The research results illustrated that before and after PAIC process implemented the posttest mean scores of knowledge of environmental education principle, natural disaster from flood disaster, flood response behavior and training achievement score were higher than pretest with statistical significance (p< .01, p< .01, p< .01, and p< .01). Three Dimensional Evaluations were employed for determination the perceptions of 38 community leaders in three aspects evaluation covering Self-evaluation, Friend-evaluation, and Facilitator-evaluation by using One-way ANOVA in order to investigate the participation of peoples and the result showed that there were no difference of mean scores for participation in training process in past, present and future situations with statistical significance (p>.05, p>.05, and p>.05). Moreover, supervising, monitoring, and evaluating for flood response behaviors, it was found that the community leaders set plan and hold meeting with community peoples to implement project for life safety with preparation of communication equipment, boat, food, water, drug, and place for living including establishing the committee for surveillance, warning, and support from involved work unit. Moreover they hold program of disaster exercise to move to safety place at good and very good levels in all aspects.

Key Words: Flood Disaster Model / PAIC Process

1. Introduction

It is claimed that a disaster might be caused by a natural or man-made with resulting in a significant physical damage or destruction, loss of life, or drastic change to the environment, therefore a disaster can be evidently defined as any terrible event origin from events such as earthquakes, floods, catastrophic accidents, fires, or explosions. It is a occurrence that can cause harm to life, property and demolish the economic, social and life quality of people. In current scholastic spheres, disasters are seen as the result of improperly managed risk. These risks are the product of a combination of both dangers and vulnerability. Hazards that strike in areas with low vulnerability will never become disasters, as is the case in unoccupied regions (Wikipedia, 2012).

Generally, a flood is an run over of water that occupies land. The European Union (EU) Floods Directive defines a flood as a covering by water of land not usually covered by water. In the sense of “flowing water”, the word may also be

applied to the inflow of the tide. Flooding may result from the volume of water within a body of water, such as a river or lake, which overflows or breaks levels, with the result that some of the water escapes its usual boundaries, or may be due to accumulation of rainwater on saturated ground in an area flood (Wikipedia, 2012, and Directive, 2007).

Throughout the summer and autumn of 2011, heavy monsoons and succeeding typhoons killed nearly 800 peoples and affected more than 8 million others across Thailand, Cambodia, Laos, Vietnam and the Philippines, reported by the United Nations. Various businesses needed expert disaster restoration services after Thailand experienced the most disturbing floods in a half century significant in the most expensive natural disaster ever. Flood water affected more than 14,000 factories, displacement of more than 600,000 workers, disrupted global supply chains, destroyed farms and drove up worldwide prices for computer hard drives and rice. In Thailand alone, where floodwaters covered an area approximately the size of the state of Florida, insured losses were estimated at more than 15 billion and total damage was expected to peak at 45 billion. The cruel flooding across Thailand in 2011 was over for several months and affected more than three million peoples and this flood was the most rigorous during five decades. Major industrial zones were hard hit, but they have built major flood walls to prevent a returning of the flood (Corben, 2012, MENAFN, 2012 and Figge, 2012).

However, the flood disaster might occur due to natural or human activities, moreover, it is complex to make decision that it is only natural situation because human have interrupted the natural system for long time ago, then the balance of natural system is also loss as well. In addition, the rapid growth of world population with 7 billion peoples, was just celebrated on 11july 2012 (UNFPA, 2012). On the other hand, the huge population was a main problem for natural resources consumption, especially, the violation of forest in every countries across the world has been arose for long ages and it also essential factors of devastation of soil surface, consequently it creates a flood and soil erosion. Moreover forests stabilize climate and adjust the water cycle by absorbing and redistributing rainwater quite equally to every species living within its range. Predominantly, in the case of tropical forests where up to 90% of the planet's species live. Tropical forests hold the highest level of biodiversity and therefore supply the biggest genes reservoir (Environment for Beginners, 2012). Therefore, it might be concluded that the flood can take place from natural and/or human origins.

Considering to characteristics of environmental education volunteer or trainer, Thiengkamol explained that its importance includes knowledge and understanding, attitude, awareness, responsibility and public mind based on inspiration of public mind. Additionally, supporting on environmental activities and decision making on environmental problem solving would be given prominence to daily life practice until it turns into established environmental behaviors such as consumption behavior, recycling behavior, energy conservation behavior, traveling behavior, forest conservation behavior and knowledge transferring behavior, consequently these behaviors are able to bring about real sustainable development.

In general, these critical characteristics should be established through all educational channels whether the formal education, informal education, non-formal education and lifelong education (Thiengkamol, 2009a, 2009b, 2011e, & 2012a). These concepts are consistent with results that discovered from the research that there are 14 essential Environmental Education Characteristics (EECs) comprised 1) ability to transfer environmental knowledge, 2) to stimulate others to realize the importance of environmental conservation, 3) to have deeply awareness about environment and natural resources, 4) to have public consciousness for environmental conservation, 5) to have positive attitude for environmental conservation, 6) to have value that for environmental conservation be everyone duty, 7) to have a sensitivity of environmental conservation, 8) to wish to take a responsibility for environmental conservation, 9) to participate to environmental conservation activities regularly, 10) to be consistency of self practice for environmental conservation, 11) to have ability to make correct decision for environmental conservation, 12) to practice as a role model of environmental conservation for public perception, 13) to have correct environmental knowledge and 14) to understanding to introduce and transfer environmental knowledge for others to practice correctly (Charoensilpa, et al, 2012b).

The development of flood disaster model through Participatory-Appreciation-Influence-Control (PAIC) process for community leaders from Kuntarawichai District in Mahasarakham Province was implemented. The samples were 38 community leaders who faced with flooding disaster in 2001 at Kuntarawichai District in Mahasarakham Province and were selected by purposive sampling method. Moreover, flood disaster model can be developed through PAIC process and flood disaster network can be built through Multi-level Management Linkage (MML) in order to share their experiences and lessons learned to their expanded network to other communities in the same province or nearby provinces including the same region in order to maintain the environment and natural resources including to save their lives and properties from flood disaster as much as possible through prevent with flood surveillance, warning, formulate policy and preparedness of administration during and after flooding disaster (Thiengkamol, 2004, Thiengkamol, 2005a, Thiengkamol, 2005b, Thiengkamol, 2011a, Thiengkamol, 2011b, Thiengkamol, 2011c, Thiengkamol, 2011g,

Thiengkamol, 2011h, Thiengkamol, 2012a, Thiengkamol, 2012b, Thiengkamol, 2012c, Gonggool, et al, 2012a, Ngarmsang, et al, 2012a, Ruboon, et al, 2012b, and Sangsan-anan, et al, 2012a).

2. Objective

The research objective was to develop a flood disaster model through Participatory-Appreciation-Influence-Control (PAIC) process for community leaders from Kuntarawichai District in Mahasarakham Province.

3. Methodology

The research design was implemented in steps by step as follows:

1) Construction of handbook for knowledge of environmental education principle, natural disaster from flood disaster, and flood response behavior (UNESCO, 1978, InWent-DSE-ZEL, 2002, Thiengkamol, 2004, Thiengkamol, 2011a, Thiengkamol, 2011e, Corben, 2012, MENAFN, 2012 and Figge, 2012).
2) The research tools composed of test, questionnaire and evaluation form. The test was used for determining their knowledge of environmental education principle, natural disaster from flood disaster, and flood response behavior.
3) The evaluation form of Three Dimensions, Four Dimensions were constructed to assess the participant practice during PAIC implemented.
4) The 38 community leaders were selected with purposive sampling from Kuntarawichai District in Mahasarakham Province. They would be recruited according to the setting criteria (willingness, time, devotion, commitment, and participation).
5) The 38 participants were employed for testing of knowledge of environmental education principle, natural disaster from flood disaster, and flood response behavior.
6) The 38 participants were trained with PAIC. The focus group discussion included brain storming in training process (Langly, 1998, Weiss, 1993, Sproull, 1988, InWent-DSE-ZEL., 2002, Thiengkamol, 2004, Thiengkamol, 2005b). The Three Dimensional Evaluation (TDE) was used to determination the congruence of three aspects evaluation, Self-evaluation, Friend-evaluation, and Facilitator-evaluation for training participation (Thiengkamol, 2004, Thiengkamol, 2005a, Thiengkamol, 2011a, Thiengkamol, 2011b, Thiengkamol, 2011c and Thiengkamol, 2011e).

4. Results

The 38 community leaders who came from community that faced with flood disaster in 2012 from Kuntarawichai District in Mahasarakham Province were selected to be a sample group for training with PAIC process. Most of them were female with 53.57 % and social position in community as Assistant of Village Head with 31.58 % as shown in table 1.

Table 1 Demographic Characteristics of Sample Group

Characteristics		Leaders from Flooding Communities	
		Frequency	Percent
Sex	Male	20	52.63
	Female	18	47.37
Social Position in Community			
	Head of District	4	10.52
	Head of Village	6	15.79
	Assistant of Village Head	12	31.58
	Member of TOA and Municipality	6	26.32
	General People	10	15.79
Total		38	100

4.1. Results of Pretest and Posttest with PAIC technique

PAIC technique was trained for 38 leaders about of environmental education principle, natural disaster from flood disaster, and flood response behavior. The research results revealed that before and after PAIC training process implemented, the posttest mean scores of knowledge of environmental education principle, natural disaster from flood disaster, and flood response behavior and training achievement score were higher than pretest with statistical significance ($p< .01$, $p< .01$, $p< .01$, and $p< .01$) as illustrated in table 2.

Table 2 Pretest and Posttest of Sample Group

Results	Posttest		Pretest		t	p
	$\overline{X}$	S.D.	$\overline{X}$	S.D.		
Knowledge environmental education principle	9.50	0.63	8.03	0.44	4.203	.00**
Knowledge natural disaster from flood disaster	9.63	0.54	7.74	0.45	5.845	.00**
Knowledge flood response behavior	9.67	0.56	8.16	0.47	4.101	.00**
Training Achievement	28.77	0.78	24.56	0.56	8.125	.00**

** Significant Level at .01

4.2. Results of Three Dimensional Evaluations for Participation at Past Situation

Three Dimensional Evaluations were employed for determination the perceptions at past situation of 38 leaders in three aspects evaluation, Self-evaluation, Friend-evaluation, and Facilitator-evaluation by using One-way ANOVA in order to investigate the mean scores difference of three group. The results of One-way ANOVA showed that there were no difference of mean scores about participation in training process through brain storming with statistical significance ($p>.05$) as illustrated in table 3. This meant that the perceptions of elementary school students about themselves, their friends in the group and their facilitators were no different for their participation during the focus group discussion process as presented in table 3.

Table 3 Three Dimension Evaluation of Sample Group Participation at Past Situation

Source of Variation	Sum of squares	df	Mean Square	F	Sig.
Between Group	56.782	2	28.391	2.713	.071
Within Group	1153.965	111	10.396		
Total	1210.747	113			

* Significant Level at .05

From table 3, it was found that Self-Evaluation, Friend Evaluation and Facilitator Evaluation, there was no statistically significant at level of .05. It indicated that the evaluation in three dimensions at past situation of 38 leaders showed no differences for participation when considering on mean scores of 3 dimensions of Self-Evaluation, Friend Evaluation and Facilitator Evaluation for participation in each group of focus group discussion, therefore it can be concluded that perceptions of Self, Friend and Facilitator were consistent to each others.

Considering on mean scores of Three Dimensional Evaluation, the total mean scores of 5 aspects of evaluation items covering Participation in Asking Questions, Participation in Answering Questions s, Participation in Discussing, Participation in Activity Doing, and Participation in Activity Evaluating during focus group discussion with brain storming process, the findings discovered that 5 aspects of participations and total mean scores of Self Evaluation were a little lower than Friend Evaluation and Facilitator Evaluation as presented in table 4. Therefore One-Way ANOVA was employed to analyze the differences of mean scores of three aspects, it was found that there were no difference with statistically significant at level of .05 as presented in table 3.

Table 4 Mean Scores of Three Dimensional Evaluations at Past Situation

Evaluation Items	Self Evaluation			Friend Evaluation			Facilitator Evaluation		
	$\overline{X}$	S.D.	Level	$\overline{X}$	S.D	Level	$\overline{X}$	S.D	Level
1. Participation in Asking Questions	3.60	.64	high	3.75	.58	high	3.87	.62	high
2. Participation in Answering Questions	3.56	.65	high	3.74	.60	high	3.78	.59	high
3. Participation in Discussing	3.58	.61	high	3.64	.64	high	3.81	.58	high
4. Participation in Activity Doing	3.60	.62	high	3.67	.68	high	3.85	.62	high
5. Participation in Activity Evaluating	3.61	.60	high	3.66	.58	high	3.79	.64	high
Total	3.59	.63	high	3.68	.62	high	3.80	.62	high

4.3. Results of Three Dimensional Evaluations for Participation at Present Situation

Three Dimensional Evaluations were employed for determination the perceptions at present situation of 38 leaders in three aspects evaluation, Self-evaluation, Friend-evaluation, and Facilitator-evaluation by using One-way ANOVA in order to investigate the mean scores difference of three group. The results of One-way ANOVA showed that there were no difference of mean scores about participation in training process through brain storming with statistical significance ($p>.05$) as illustrated in table 3. This meant that the perceptions of elementary school students about themselves, their friends in the group and their facilitators were no different for their participation during the focus group discussion process as presented in table 5.

Table 5 Three Dimension Evaluation of Sample Group Participation at Present Situation

Source of Variation	Sum of squares	df	Mean Square	F	Sig.
Between Group	58.358	2	29.179	1.913	.151
Within Group	1693.083	111	15.253		
Total	1751.441	113			

* Significant Level at .05

From table 5, it was found that Self-Evaluation, Friend Evaluation and Facilitator Evaluation, there was no statistically significant at level of .05. It indicated that the evaluation in three dimensions at present situation of 38 leaders showed no differences for participation when considering on mean scores of 3 dimensions of Self-Evaluation, Friend Evaluation and Facilitator Evaluation for participation in each group of focus group discussion, therefore it can be concluded that perceptions of Self, Friend and Facilitator were consistent to each others.

Considering on mean scores of Three Dimensional Evaluation, the total mean scores of 5 aspects of evaluation items covering Participation in Asking Questions, Participation in Answering Questions s, Participation in Discussing, Participation in Activity Doing, and Participation in Activity Evaluating during focus group discussion with brain storming process, the findings discovered that 5 aspects of participations and total mean scores of Self Evaluation were a little lower than Friend Evaluation and Facilitator Evaluation as presented in table 6. Therefore One-Way ANOVA was employed to analyze the differences of mean scores of three aspects, it was found that there were no difference with statistically significant at level of .05 as presented in table 5.

Table 6 Mean Scores of Three Dimensional Evaluations at Present Situation

Evaluation Items	Self Evaluation			Friend Evaluation			Facilitator Evaluation		
	$\overline{X}$	S.D.	Level	$\overline{X}$	S.D	Level	$\overline{X}$	S.D	Level
1. Participation in Asking Questions	3.78	.57	high	3.84	.58	high	3.91	.61	high
2. Participation in Answering Questions	3.79	.62	high	3.78	.60	high	3.98	.59	high

3. Participation in Discussing	3.84	.58	high	3.86	.61	high	3.89	.58	high
4. Participation in Activity Doing	3.76	.59	high	3.79	.60	high	3.95	.57	high
5. Participation in Activity Evaluating	3.75	.60	high	3.85	.59	high	3.91	.60	high
Total	3.77	.59	high	3.84	.60	high	3.95	.59	high

4.4. Results of Three Dimensional Evaluations for Participation at Future Situation

Three Dimensional Evaluations were employed for determination the perceptions at future situation of 38 leaders in three aspects evaluation, Self-evaluation, Friend-evaluation, and Facilitator-evaluation by using One-way ANOVA in order to investigate the mean scores difference of three group. The results of One-way ANOVA showed that there were no difference of mean scores about participation in training process through brain storming with statistical significance (p>.05) as illustrated in table 7. This meant that the perceptions of elementary school students about themselves, their friends in the group and their facilitators were no different for their participation during the focus group discussion process as presented in table 7.

Table 7 Three Dimension Evaluation of Sample Group Participation at Future Situation

Source of Variation	Sum of squares	df	Mean Square	F	Sig.
Between Group	51.886	2	25.943	1.627	.204
Within Group	1769.895	111	15.945		
Total	1821.781	113			

* Significant Level at .05

From table 7, it was found that Self-Evaluation, Friend Evaluation and Facilitator Evaluation, there was no statistically significant at level of .05. It indicated that the evaluation in three dimensions at future situation of 38 leaders showed no differences for participation when considering on mean scores of 3 dimensions of Self-Evaluation, Friend Evaluation and Facilitator Evaluation for participation in each group of focus group discussion, therefore it can be concluded that perceptions of Self, Friend and Facilitator were consistent to each others.

Considering on mean scores of Three Dimensional Evaluation, the total mean scores of 5 aspects of evaluation items covering Participation in Asking Questions, Participation in Answering Questions, Participation in Discussing, Participation in Activity Doing, and Participation in Activity Evaluating during focus group discussion with brain storming process, the findings discovered that 5 aspects of participations and total mean scores of Self Evaluation were a little lower than Friend Evaluation and Facilitator Evaluation as presented in table 8. Therefore One-Way ANOVA was employed to analyze the differences of mean scores of three aspects, it was found that there were no difference with statistically significant at level of .05 as presented in table 7.

Table 8 Mean Scores of Three Dimensional Evaluations at Future Situation

Evaluation Items	Self Evaluation			Friend Evaluation			Facilitator Evaluation		
	$\overline{X}$	S.D.	Level	$\overline{X}$	S.D	Level	$\overline{X}$	S.D	Level
1. Participation in Asking Questions	3.84	.58	high	3.95	.55	high	3.97	.59	high
2. Participation in Answering Questions	3.80	.57	high	3.94	.61	high	3.99	.60	high
3. Participation in Discussing	3.82	.59	high	3.93	.60	high	3.96	.62	high
4. Participation in Activity Doing	3.82	.62	high	3.92	.62	high	3.92	.57	high
5. Participation in Activity Evaluating	3.81	.63	high	3.89	.59	high	3.94	.58	high
Total	3.83	.59	high	3.93	.63	high	3.95	.60	high

4.5. Results of Supervising, Monitoring and Evaluating

After PAIC was implemented for 2 months, the supervising, monitoring, and evaluating for flood response behaviors were conducted and the results were illustrated as in table 9.

Table 9 Supervising, Monitoring, and Evaluating for Flood Response Behaviors

Items	Mean	S.D.	Results
1. Community leaders set plan for flood response.	4.56	0.56	Very Good
2. They hold meetings.	4.61	0.67	Very Good
3. They implement project for life safety.	4.51	0.59	Very Good
4. They prepare communication equipment.	4.39	0.71	Good
5. They prepare boats and manpower.	4.22	0.55	Good
6. They establish the committee for surveillance	4.65	0.64	Very Good
7. They cooperate with involved work unit for asking support.	4.53	0.58	Very Good
8. They prepare place for moving.	4.17	0.54	Good
9. They prepare food, drink and drug.	4.43	0.62	Good
10. They hold program of disaster exercise to move to safety place.	4.69	0.57	Very Good
Holistic Views	4.57	0.66	Very Good

From table 9, supervising, monitoring, and evaluating for flood response behaviors, it was found that the community leaders set plan and hold meeting with community peoples to implement project for life safety with preparation of communication equipment, boat, food, water, drug, and place for living including establishing the committee for surveillance, warning, and support from involved work unit. Moreover they hold program of disaster exercise to move to safety place at good and very good levels in all aspects.

Discussions

The results indicated that the 38 leaders had knowledge of environmental education principle, natural disaster from flood disaster, and flood response behavior after participating in the PAIC training. These results were congruent to a variety of studies of Thiengkamol, N., (2004, 2005a, 2005b, 2010b, 2011b, 2011c, 2011g, 2011h, and 2012a & 2012b) and her colleagues (Charoensilpa, et al, 2012a, Morrasri, et al, 2012a, Saenpakdee, & Thiengkamol, 2012, Sukwat et al, 2012, Sukserm, et al, Gonggol, et al, 2012a, Ngarmsang, et al, Wattanasaroch, et al, 2012, Ruboon, et al, 2012b, & Sangsan-anan, et al, 2012a). It might be explained that the training with PAIC technique is able to raise knowledge in various issues and for different target groups and it can be used for stimulation with the environmental education principle covering knowledge and understanding, awareness, attitude, and public consciousness, and environmental management covering energy and tree conservation, and waste management after participating in the PAIC training through genuine practicing behavior in their daily life activities for environmental conservation. The findings are also pertinent to the results from the study of different studies of Thiengkamol, (2004, 2005a, 2005b, 2010b, 2011b, 2011c, 2011g, 2011h, and 2012a & 2012b) and her colleagues (Charoensilpa, et al, 2012a, Morrasri, et al, 2012a, Saenpakdee, & Thiengkamol, 2012, Sukwat et al, 2012, Sukserm, et al, Gonggol, et al, 2012a, Ngarmsang, et al, Wattanasaroch, et al, 2012, Ruboon, et al, 2012b, & Sangsan-anan, et al, 2012a) that the participation is affected environmental conservation to meet sustainable development through environmental education process covered knowledge and understanding awareness, attitude, and public consciousness, and environmental management covering energy and tree conservation, and waste management.

The results of TDE of 38 participants were employed for determination of the congruence of three aspects evaluation, Self-evaluation, Friend-evaluation, and Facilitator-evaluation in past, present and future situations. The mean scores three aspects were no difference among three aspects ($p>.05$, $p>.05$, and $p>.05$). The mean scores of Self-Evaluation was lower than mean scores of Friend-Evaluation and Facilitator-Evaluation, so it indicated that the participants evaluated themselves lower than friend and facilitator because they are humble persons that are general style of Thai people. Additionally, TDE was used to evaluate the participation of community leaders; it was found that the mean scores of Self Evaluation, Friend Evaluation and Facilitator Evaluation were at high level as illustrated in table 4, 6 and 8. It might be concluded that community leaders during training process as illustrated in table 4, 6 and 8 paid attentions for training process participation at very good level. The result of training was pertinent to different studies of Thiengkamol, (2004, 2005a, 2005b, 2010b, 2011b, 2011c, 2011g, 2011h, and 2012a & 2012b) and her colleagues (Charoensilpa, et al, 2012a, Morrasri, et al, 2012a, Saenpakdee, & Thiengkamol, 2012, Sukwat et al, 2012, Sukserm, et al, Gonggol, et al, 2012a, Ngarmsang, et al, Wattanasaroch, et al, 2012, Ruboon, et al, 2012b, & Sangsan-anan, et al, 2012a). Furthermore, it was found that PAIC training is effective for training with integration of brain storming process to develop a shared vision, action plan and projects in different issues of training such as energy conservation, urban community food security management, environment and natural resource conservation, development of health cities

network for Mekong Region, development of women's political participation in Pattaya City, community strengthening, environmental management in dormitory, and soil and water conservation (Thiengkamol, N., 2004, 2005a, 2005b, 2010b, 2011b, 2011c, 2011g, 2011h, and 2012a & 2012b), and her colleagues (Charoensilpa, et al, 2012a, Morrasri, et al, 2012a, Saenpakdee, & Thiengkamol, 2012, Sukwat et al, 2012, Sukserm, et al, Gonggol, et al, 2012a, Ngarmsang, et al, 2012a, Wattanasaroch, et al, 2012, Ruboon, et al, 2012b, & Sangsan-anan, et al, 2012a).

After, the PAIC training implemented, supervising, monitoring, and evaluating for flood response behaviors, it was found that the community leaders set plan and hold meeting with community peoples to implement project for life safety with preparation of communication equipment, boat, food, water, drug, and place for living including establishing the committee for surveillance, warning, and support from involved work unit. Moreover they hold program of disaster exercise to move to safety place at good and very good levels in all aspects. In addition, the result went along with numerous studies of Thiengkamol, N., (2004, 2005a, 2005b, 2010b, 2011b, 2011c, 2011g, 2011h, and 2012a & 2012b) and her colleagues (Charoensilpa, et al, 2012a, Morrasri, et al, 2012a, Saenpakdee, & Thiengkamol, 2012, Sukwat et al, 2012, Sukserm, et al, Gonggol, et al, 2012a, Ngarmsang, et al,2012a, Wattanasaroch, et al, 2012, Ruboon, et al, 2012b, & Sangsan-anan, et al, 2012a).

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