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## Developing ICT Competency for Thai Teachers through Blended Training

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### Abstract

The purpose of this study aims to enhance teachers' ICT competency. Three hundred and thirty seven teachers are surveyed through a questionnaire to identify training problems and training needs. Then the blended training model is implemented with teachers. The result showed that it can increase score in cognitive and attitude tests. The post-test score is higher than those pre-test score at .01 level of statistical significance. Also, teachers' ICT competency is in good level.

**Keywords:** *Blended training, teacher training, ICT competency, cognitive, attitude*

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## Introduction

Teachers are key factors to education development, the effective teachers will enhance the quality of students (Atagi, 2002). Training in teachers' society is used to develop them meet the requirements of professional teachers as well as improving their knowledge, experiences, attitudes, values, morals and skills (Carr, 1999). The training curriculum with teacher's actual training is needed, limited training opportunities, difficulty is scheduling training during school hours, long travel times to training venues and use of inappropriate ICT media by trainers. This meant that training notes were often not available and revision by trainees was not possible. There was also no or limited follow-up once the trainees were back at school.

The training sometimes did not have a practical teaching focus and was difficult to apply on a day to day basis. Traditional training involves classroom lectures, seminars and group discussions. More use is now being made of "web-based training" using websites as the media to the trainees. The trainees can study the training content and undertake training in logical steps or modules at their leisure. This avoids some of the limitations on time, training availability and travel imposed by traditional training. It also offers opportunities for trainees to undertake further research if they are interested in the particular topic (Akarawang et.al., 2014).

Web-based training still presents problems for teachers due to poor understanding of ICT media and lack of interaction with other trainees. Teachers in Thailand, in particular, may benefit through group interactions and socializing available in traditional training. Learning as a group allows more ideas to be thrown in and may generate practical discussions and directions to implement the training to the benefit of all participants. Landers (2009) found that web-based training was more efficient than traditional training in imparting knowledge and problem solving, but was less effective in application of skills.

Blended training is a relatively new concept in Thailand and combines both traditional training and web-based training. The benefits of traditional training - classroom and group interaction—may be combined with the benefits of web-based training including greater numbers of participants and flexibilities in scheduling. Trainees are typically introduced during the traditional training which can be shorter and aimed at greater numbers of participants. Participants can then use these contacts during the more detailed follow-up web-based training including through social media, e-mails, shared research, chat rooms and download sites.

The Office of the National Education Council (2011) has assessed education standards in Thailand since 1999 and identified problems in education technology development for teachers. Teachers and students were identified as lacking technology instruction and self-directed learning (Office of the National Education Council, 2009a). Teachers must develop ICT competency and that ICT should be a priority in the training curriculum for teachers. The study employed blended training to enhance teachers ICT competency. The significance of the study can be discussed and generalized to the era of educational reform in Thailand.

## Methodology

The needs assessment included a literature review to study standards of ICT training for teachers in the Office of the Basic Education Commission, Thailand. This assessment informed the survey questionnaire. The results are discussed against the research to identify similar and dissimilar trends and outcomes. The survey questionnaire was completed by 377 teachers from 35 schools in the North-Eastern part of Thailand. Teachers in North-Eastern Thailand have been found in previous studies to have a major need for development (Office of the National Education Council. 2010: 108).

An in-depth interview was held with 12 stakeholders to supplement the questionnaire and help design the blended training model. These stakeholders comprised 4 school directors (principals), 4 supervisors and 4 senior teachers. Following analysis of the survey outcomes (as discussed in this paper) a draft blended training model was developed. This was based on education system training from Sukhothai Thammathirat Open University (2004). Other products accompanying the model include a manual and documentation. Model is verified by focus group discussions. The focus group had 7 persons with experience and responsibilities related to education curriculum, technology and training design.

Blended training is undertaken using 36 volunteer trainees. Trainees were subject to standard cognitive, practical skills and attitudes tests before and after the training. A questionnaire to measure training satisfaction was also used. The statistics used were percentage, mean, standard deviation and dependent t-test. The object of the training was to instruct teachers in the use of the Desktop Author program to create electronic media to enhance their ICT competency.

Training is divided into 3 steps, the first step in training was classroom training over 2 days. Trainees worked through principles of objectives training, training steps, training activity evaluation and criterion of training to enhance ICT competencies. Trainees also considered media for web-based training use and content, including methods of connecting with the trainer and other trainees, chat rooms, homework, and trainee score checks. Trainees practiced skills to create electronic media with DeskTop Author. Trainees were tested on knowledge and attitude before passing onto the second step.

The second step was web-based training once per month. Trainees were registered and used a login at a common web site ([www.kruchaiya.net](http://www.kruchaiya.net)). The web-based training was developed by the researcher and used in this training. Trainees could undertake the web-based component at any time or location. They could also chat and collaborate with the trainer (researcher in this case) and other trainees. The researcher mentored trainees on web-based training, as necessary, to assist in self-learning techniques such as time allocations, use of the web site, on-line homework and tests, use of chat rooms, answer questions, and to facilitate collaborative learning.

The third step was follow-up classroom training held over one day. The objective of this step was to test learning and satisfaction (or otherwise) with the training model. Trainee groups were required to collaborate to solve a real-life ICT problem. Trainees also undertook knowledge and attitude tests, and filled out a satisfaction survey.

## Results

A summary of the survey participant demographics and information technology usage is at Table 1 (primary data). The results show that 93% of teachers have IT devices to connect with the internet, 92% use the internet, 92% of teachers' offices (schools) have internet (100% of these at acceptable/moderate speed), and 76% of teachers routinely use the internet at school. Some 71% of teachers favor blended training methods for ICT training as it be shown in table 1.

Table 1. Surveying information

Item	Response	Number	Percentage
1. Gender	Male	107	28.38
	Female	270	71.62
2. Age	20 – 29 years	48	12.73
	30-39 years	95	25.20
	40 – 49 years	94	24.93
	50 years	140	37.14
3. Education level	Under graduate	10	2.65
	Graduate	289	76.66
	Master's degree	77	20.42
	Doctor 's degree	1	0.27
4. Specification subject	Computer or ICT	28	7.43
	Another	349	92.57
5. Class level teaching	Grade1-3	113	29.97
	Grade 4-6	122	32.36
	Grad 7-9	103	27.32
	Grade 10-12	39	10.34
6. Do you have this device? What device did you have?	Nothing	26	6.90
	Personal computer	180	47.75
	Lab top computer	299	79.31
	iPad/Tablet	122	12.73
	iPhone/Smart phone	122	32.36
7. How many hours do you use internet per day?	Nothing	35	9.28
	1-2 hours	155	41.11
	3-4 hours	98	25.99
	5-6 hours	62	16.45
	more than 7 hours	27	7.16
8. Do you use internet? Where do you use?	Nothing	32	8.49
	Using	346	91.78
	At home	213	56.50
	At work	285	75.60
	Another; restaurant, coffee shop	20	5.31
9. Do your office have internet and how fast is it?	Nothing	0	0.00
	Have	377	100.00
	Slow	86	22.81
	Moderate	259	68.70
	Fast	32	8.49

10. How many hours do you use internet per day?	Nothing	39	10.34
	1-2 hours	179	47.48
	3-4 hours	99	26.26
	5-6 hours	42	11.14
	More than 7 hours	18	4.77
11. Where do you prefer to do training?	In my school	214	56.76
	Outside school	163	43.24
12. What method do you prefer to do training?	Classroom training	98	25.99
	Web-based training	12	3.18
	Blended training	267	70.82

Teachers' views and opinions on the current ICT training are informed. The results indicated 3 key problems: training was during teaching time, trainees had different competency and interests, and training was often not related to actual needs due to lack of a proper needs assessment. The information is shown in table 2.

Table 2. Teachers' views on ICT training

Item	Score		Level of views
	$\bar{X}$	S.D.	
<b>Needs assessments training study</b>			
1. Training institute less study of needs assessments training.	4.25	1.09	rather more
2. Training institute less specify competency training.	4.03	1.05	rather more
3. Training institute less competency trainees study before training.	4.12	1.12	rather more
4. I don't understand the object of training, what knowledge or skills were sought.	3.67	1.22	rather more
<b>Training curriculum</b>			
5. Training curriculum wasn't problem solving.	3.57	1.13	rather more
6 Training curriculum didn't meet my need assessment.	3.57	1.16	rather more
7. Training method wasn't suitable, and object training failed.	3.63	1.11	rather more
8. Training media wasn't suitable, and object training failed.	3.58	1.13	rather more
9. Training activity wasn't of interest, and made me bored.	3.55	1.13	rather more
10. I participate in training.	3.80	1.18	rather more
11. Trainees had difference competency, and different interest.	4.40	1.10	rather more
12. Training activity was descriptive more than practice skills.	4.02	1.11	rather more
<b>Training opportunity</b>			
13. Training Institute had limited number trainees.	4.14	1.11	rather more
14. My Institute wasn't promised to training.	3.04	1.34	rather less
<b>Training time</b>			
15. Training had a short time, and adversely affected my knowledge.	3.83	1.14	rather more
16. Training time was the same time to teach my students.	4.42	1.22	rather more
17. I had too much work, and can't do full training.	3.64	1.38	rather more
<b>Training budgeting</b>			
18. My school hasn't money for my training.	4.12	1.37	rather more
19. Training management hasn't money for my training.	4.09	1.30	rather more
<b>Training location</b>			
20. Training location was far away from trainees, and difficult to travel.	3.96	1.28	rather more
21. Training location wasn't suitable.	3.55	1.16	rather more
<b>Training sources</b>			
22. Lecturer wasn't using appropriate ICT media.	3.55	1.16	rather more
23. I can't review lecture wording because training lecture record not provided.	3.72	1.26	rather more
<b>Training Following and assessment</b>			
24. Training institute does not show criterion for training.	3.77	1.17	rather more
25. Training Institute does not do assessment training about trainees knowledge.	3.80	1.20	rather more
26. Training institute less follow-up trainees and knowledge to apply in school.	4.14	1.25	rather more
Average total	3.84	1.19	rather more

Teacher's identified needs to enhance their ICT competency. Key needs are instructions and training on creating suitable electronic media for teaching (i.e. CAI, WBI, e-Learning, e-Book; use of internet and networking; and computer use as it be shown in Table 3.

Table 3. Training needs

Item	Score		Level of needs
	$\bar{X}$	S.D.	
1. Using internet and networking	4.63	1.21	more
2. Computer using	4.52	1.20	more
3. Instruction media creating ; CAI, WBI, e-Learning, e-Book	4.67	1.27	more
4. Microsoft Office using			
4.1 MS Office Word	4.27	1.40	rather more
4.2 MS Office Excel	4.35	1.37	rather more
4.3 MS Office PowerPoint	4.35	1.42	rather more
4.4 MS Office Access	4.38	1.39	rather more
5. ICT knowledge basic	4.28	1.28	rather more
6. Law and Moral ICT	4.03	1.30	rather more
7. Tablet Instructional	4.38	1.35	rather more

Other ICT issues raised by teachers included concerns that budgeting for training was not adequate and there had been limited time to complete a training needs analysis. In addition, the training curriculum tended to take a 'top down' lecturing approach and wasn't problem solving. Other comments were that teachers should receive training in policy, training activities were descriptive and not practical, trainees had different competencies and that attendance at distant training venues was a difficult for small schools. Poor after-training assistance meant that difficulties in practical implementation could not be addressed.

The in-depth stakeholder interviews identified a number of issues, including that the training curriculum was created by the Center of Education and did not respond to the needs of trainees. Similar issues were identified as from the questionnaire results including lack of a needs assessment of the trainees, the training curriculum wasn't problem solving, training activities were more descriptive than practical and trainees had different competencies. Stakeholders suggested that assessment analysis was needed to group trainees with similar competencies. Lack of personnel to assist post-training was also identified as an issue. Some stakeholders identified a requirement for supervision training. According to the stakeholders, budgetary issues also placed constraints on training and revision of the training curriculum.

The results also indicate that trainers should undertake a study needs assessment before training to ensure the content of training is interesting and relevant to the trainees. Training activities should have a practical focus rather than being merely descriptive. Trainees should have opportunities to participate in training evaluation both before and after training, including in developing training content and methods of training. Training should cover training steps both before and after training, including needs assessments training, curriculum planning, material training, process training and evaluation.

Key inputs include training needs assessments for ICT and development of a revised training curriculum. The needs assessment is also used to group teachers into common competencies so that training groups are relatively homogeneous. The blended training is a mixture of classroom activities such as lectures, group discussions, facilitated discussions and demonstrations while web-based elements include e-mail, chat rooms, common web-boards and download sites. Web-based elements are undertaken by partnered or grouped trainees to facilitate shared training and communications.

## Discussion

Thailand standard of ICT competency recognizes 3 elements: cognitive ability; skills; and attitude. The researcher used a synthesized measure of ICT competency from this standard to develop the study method and survey questions. Training problems identified in this survey included that the training curriculum was not based on a teacher need assessment, training locations were distant, training time was limited, there were limited trainees places, training was based on an outdated curriculum, training notes were not recorded and could not be reviewed, and training lacked evaluation and post-training support. The studies also identified poor curriculums, lack of training opportunities, limited budgets, location, content source and poor evaluation as problematic.

Ways to enhance ICT competency suggested by the survey included to create innovative delivery media such as CAI, WBI, e-Learning and e-Books. These have also been suggested by the Teacher Council of Thailand (2005). The Council has specified an ICT standard competency for teachers. The Office of the Basic Education Commission (2010) has specified behaviors for teachers in

ICT using media, innovation and instruction for suitable content and activity learning. This indicator was the one of the ICT functional competencies for teachers used in this study.

There was no training needs assessment of trainees, the training curriculum wasn't problem solving, and training activities were more descriptive than practical. There was limited training evaluation undertaken to indicate whether teachers found the training practical and useful. Research undertaken as part of this study, and the in-depth interviews, suggested that successful ICT teacher training Thailand should include:

- Training needs assessment undertaken by both training agencies and individual teachers to better direct and inform the training curriculum (ideally this should incorporate feedback and discussions between trainers and representative teachers);
- Training activities to have a practical focus and cover specific learning steps post training;
- Opportunities for trainees to participate both before and after training; and
- Blended training to take advantage of wide internet coverage amongst teachers and economies of scale.

Ideally, the needs assessment should be used to group teachers in terms of core competencies so that trainees in classes have similar competencies. Initial classroom training would involve larger classes with a focus on the core training principles and practical implementation. An introduction to the web-based training elements or modules would be provided and the media explained and demonstrated. Trainees would also have the opportunity to form partnerships and groups to take most advantage of the web-based elements.

Training websites should be of interesting design and have many practical ideas for teacher needs, training activities must be interesting, perhaps including photos of trainees, and be supported by dynamic websites that are regularly updated. Reinforcement should be provided through certificates, working awards, social media recognition and other support for trainees teams engaged in collaborative learning.

The needs assessment will be used to develop the content, including through use of volunteer teachers. It is important that the design incorporate principles of adult learning to maximize success and that training is based on real life examples. Current priority teacher needs for ICT training have been identified as instructions and use of different electronic media and this should be the initial primary focus. The blended training allowed participants had practical skills. The web-based training used practical examples and homework to reinforce the lessons and familiarity with the program. The trainer and assistant trainer were available to provide assistance at all times. The web-based training allowed participants to work on real examples, review lessons, chat and otherwise collaborate in completing their homework assignments.

Landers (2009) found that web-based training was more efficient than classroom training on searching and problem solving. Blended training maximized the efficiency of classroom training and provided better reinforcement in the web-based elements. Blended training was, overall, less costly. Participants in the blended training observed that the training was also useful in filling a gap in the training curriculum and was therefore directly related to improving ICT competency for better teaching. Blended training, incorporating web-based training, appears to be an effective method to enhance teacher competency in ICT. The researcher suggests that training institutes in Thailand should investigate and incorporate blended training into their curriculums.

Blended training was preferred over either traditional training methods or web-based training. Because internet coverage was wide, ICT education offered economies over long time scales, broad geographic scales and could promote interactive learning. Trainees could still ask questions or collaborate their learning with other trainees and instructors on web-based training if proper electronic media were used. Stakeholders suggested that training should cover the training process as well as principals and theory. Trainees groups should be the same level of competency to promote more effective learning.

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