T-LOVE: Critical Thinking Instructional Model Based on the Kalama Sutta Approach for Thai Teachers

- Supa Thaikeow
- Chalong Tubsree
- Somsak Lila

Abstract: *The purpose of this study was to develop a Critical Thinking Instructional Model based on the Kalama Sutta Approach for Thai teachers. A mixed-methods sequential exploratory strategy was employed with qualitative in-depth interviews of 18 Buddhist experts. Data analysis was done by using In vivo and focused coding analysis. Quantitative investigation was conducted by using questionnaires measuring 309 teachers' opinions towards the proposed model, analyzing the data with the second-order confirmatory factor analysis. The implementation of the model was conducted by using two instruments: five KSACT Lesson Plans were employed to teach 30 Mathayomsuksa two students, and the KSACT-Test was administered before and after the instruction. The findings revealed that the Critical Thinking Instructional Model, based on the Kalama Sutta Approach for Thai teachers, was integrated in a model of "T-LOVE", comprising of five steps: T-Train the Mind; L- Learn the Situations; O-Observe Assumptions; V-Verify Morals; and E-Extend Vision. The validation of the model indicated an acceptable goodness of fit. The effectiveness of the model indicated that students taught with the T-LOVE model earned higher critical thinking ability scores than on the pre-test at the .05 level of statistical significance.*

Keywords: Critical Thinking Instructional Model, Kalama Sutta Approach

Introduction

Critical thinking has become an essential competency for people in the information age and the global economy (Mason, 2007). Besides, critical thinking is also widely lauded as one of the most vital education goals today (Cosgrove, 2009). The context of critical thinking means wisely reasonable considering both the pros and the cons of information before believing or judging. It is also the ability to analyze and evaluate information. Nowadays, people in the world, including Thai people, are in the same situation as in the world of information explosion. People need a tool to scan and weed out unsuitable information. It means they need to apply critical thinking skills effectively to the complex problems they will face or come across, and to the appropriate alternatives they will choose from the massive information.

According to Dhammapitaka (2002, p. 232), the Kalama Sutta Approach of Lord Buddha can be an effective tool to solve the abovementioned problems, because Lord Buddha offered 10 criteria to find out what is truth and worthy of believing: 1) Be not led by report; 2) Be not led by tradition; 3) Be not led by hearsay; 4) Be not led by the authority of texts; 5) Be not led by mere logic; 6) Be not led by inference; 7) Be not led by considering appearances; 8) Be not led by the agreement with a considered and approved theory; 9) Be not led by seeming possibilities; and 10) Be not led by the idea, "This is our teacher".

"Lord Buddha taught us not to accept or believe anything immediately. He gave ten basic conditions to beware of in order to avoid becoming the intellectual slave of anyone, even of the Buddha himself" (Bhikkhu, 1988, p. 5). His teachings encouraged critical thinking that is fundamentally required for all people in making decisions whether to accept, reject, or suspend judgment about the related statements. That means all people should carefully consider before believing. Critical thinking refers to a process of careful and reasonable reflection before deciding to believe or do.

With regard to the importance of promoting critical thinking to students, teachers are the key people who can make this goal possible by attempting to design their teaching procedures for enhancing students' critical thinking. However, this process will be possible only if the teachers have effective strategies as a practical critical thinking model. The researcher is an educational supervisor of the Secondary Educational Service Area, who is interested in promoting critical thinking in secondary schools. Development of a critical thinking model based on Kalama Sutta Approach for Thai teachers was her final goal of this study.

Research Purposes and Research Questions

The three purposes of the study were: 1) To develop a Critical Thinking Instructional Model based on the Kalama Sutta Approach for Thai teachers; 2) To validate the Critical Thinking Instructional Model based on the Kalama Sutta Approach for Thai teachers; and 3) To investigate the effects of the Critical Thinking Instructional Model based on the Kalama Sutta Approach for Thai teachers.

The research questions were: 1) "What is the Kalama Sutta Critical Thinking Instructional Model as a result of the development?"; 2) "How well is the Kalama Sutta Critical Thinking Instructional Model confirmed by the teachers?" ; and 3) "How effective is the Kalama Sutta Critical Thinking Instructional Model?". The two sub-research questions were: "Does the Kalama Sutta Critical Thinking Instructional Model enhance students' critical thinking ability?"; and "To what extend does the Kalama Sutta Critical Thinking Instructional Model increase students' critical thinking ability?".

Research Procedure

This study applied the mixed methods research approach using a sequential exploratory strategy. It focused on collecting, analyzing, and mixing both quantitative and qualitative data in a single study (Creswell & Clark, 2007). The study was comprised of four phases.

Phase 1: Collecting qualitative data for the model development

The researcher adopted the face-to-face and in-depth approach of a semi-structured interview as the strategic tool for collecting qualitative data. The interview guide consisted of eight open-ended questions as follows: 1) "What are the problems in fostering Thai students' critical thinking nowadays?"; 2) "Could you elaborate on Kalama Sutta? What is it? and What is it good for?"; 3) "What are the core beliefs of the Kalama Sutta Approach?"; 4) "What are the critical thinking methods of the Kalama Sutta Approach?"; 5) "Which dhamma cores are in the Kalama Sutta Approach?" ; 6) "Which other dhamma would you recommend to combine with the Kalama Sutta Approach?"; 7) "How can we apply the Kalama Sutta Approach to our daily lives?"; and 8) "Would you please recommend the use of the Kalama Sutta Approach to develop the critical thinking skills of Mathayomsuka students?".

The participants were the 18 experts in Kalama Sutta approach that were selected by using snowball sampling (Babbie, 2008, p. 205). Five educational experts were asked to suggest participants who had extra knowledge about Kalama Sutta Approach according to three criteria: 1) They taught Buddhist Studies; 2) They had a sound knowledge and understanding in the Kalama Sutta Approach; and 3) They demonstrated their willingness to participate in the study. The participants' profiles are presented in Table 1.

Table 1. Participants' profiles

Code	Gender	Status	Position/ Wat/ Workplace
K1	Male	Bhikku	Vice Abbot of Wat in Chonburi
K2	Male	Bhikku	Lecturer of Buddhist University
K3	Male	Bhikku	Lecturer of Buddhist University
K4	Male	Bhikku	Lord Abbot of Wat in Nakhon Sawan
K5	Male	Bhikku	Lecturer of Buddhist University

K6	Male	Bhikku	Vice Abbot of Wat in Bangkok
K7	Male	Bhikku	Lord Abbot of Wat in Nonthaburi
K8	Male	Bhikku	Lecturer of Buddhist University
K9	Male	Bhikku	Lecturer of Buddhist University
K10	Male	Bhikku	Lord Abbot of Wat in Rayong
K11	Male	Bhikku	Lord Abbot of Wat in Lopburi
K12	Male	Bhikku	Lord Abbot of Wat in Bangkok
K13	Male	Bhikku	Vice Abbot of Wat in Bangkok
K14	Female	Maechee	Lecturer of Buddhist University
K15	Male	Layman	Lecturer of Buddhist University
K16	Male	Layman	Lecturer of Buddhist University
K17	Male	Layman	Lecturer of Buddhist University
K18	Female	Laywoman	Lecturer of Buddhist Studies

In the process of data analysis, the researcher considered two coding methods: 1) In vivo coding as the first cycle method; and 2) Focused coding as the second cycle coding method. The advantages and disadvantages of these two methods can be considered under the criteria of the suitable context of the research. In this study, the experiences, ideas, and perspectives of the participants were an essential part of the study. In order to analyze all participants' data, the researcher employed the In vivo coding method as the technique to collect the initial data, since "In vivo coding uses the direct language of the participants as codes rather than researcher-generated words and phrases" (Saldana, 2009, p. 48). However, in the process of collecting data, categorizing and thematizing were the final tasks for the researcher to develop better defined categories and to interpret the meaning of all information into a context for presentation of the findings. The researcher used focused coding for categorization of the themes of the first cycle method and to interpret the meaning of all information into a context for presentation of the findings, since "focused coding is appropriate for virtually all qualitative studies... and the development of major categories or themes from the data" (Saldana, 2009, p. 155). To find the main themes of focused codes, the researcher employed a word-based technique or "an analysis of words (word repetitions, key-indigenous terms, and key-words-in the contexts)" Ryan & Bernard (2013, p. 2).

The reliability of the qualitative method was very vital. In this research, the researcher used check-coding by asking another coder to code the same data set separately and then improving the reliability of the data by using the reliability formula of Miles & Huberman (1994, p. 64) that is shown below.

$$\text{Reliability} = \frac{\text{number of agreements}}{\text{total number of agreements + disagreements}}$$

Miles and Huberman (1994, p. 64) also recommended the inter-coder agreement should be in the 90% range. For this study, the researcher set the criteria of agreement at 85-100%.

Phase 2: Designing a critical thinking instructional model

In phase 2, the researcher developed a critical thinking model by utilizing the first two steps of the ADDIE Model (i.e., A-Analysis and D-Design) as follows:

1. Analysis: To examine and analyze the critical thinking instructional model based on the Kalama Sutta Approach from the data of the in-depth interviews in phase 1 by generating problems of students' critical thinking that are current in Thailand, collecting data of the importance and benefit of the Kalama Sutta Approach, considering the core beliefs and thinking methods of Kalama Sutta Approach, finding the dhamma core in Kalama Sutta Approach; and identifying the application of the Kalama Sutta Approach in the classroom.

2. Design: To design a Kalama Sutta Critical Thinking Instructional Model based on the results of the analysis of the data from the analysis step. Finally, the researcher created a prototype of a Critical Thinking Model based on the Kalama Sutta Approach.

Phase 3: Validating the critical thinking instructional model

In phase 3, the researcher implemented the third step of the ADDIE Model (i.e., D-Develop). The researcher selected a sample of 309 secondary school teachers from the Secondary Educational Service Area Office 18 (Chonburi- Rayong), teaching in Mathayomsuksa 1-3 (grade 7-9). They were selected by using Multistage Cluster Random Sampling (Babbie, 2008), as illustrated in Table 2.

Table 2. Sample selection

The Secondary Educational Service Area Office 18 (Chonburi-Rayong)				
Chonburi			Rayong	
no. of schools in cluster 1	no. of schools in cluster 2	no. of schools in cluster 3	no. of schools in cluster 1	no. of schools in cluster 2
12	8	11	11	8
random 50% of schools	random 50% of schools	random 50% of schools	random 50% of schools	random 50% of schools
6	4	6	6	4
random 50% of schools	random 50% of schools	random 50% of schools	random 50% of schools	random 50% of schools
3	2	3	3	2
random 50% of teachers in each school	random 50% of teachers in each school	random 50% of teachers in each school	random 50% of teachers in each school	random 50% of teachers in each school
77	41	66	80	45
Total no. of samples = 309				

The research tool was a questionnaire with a five-point Likert scale divided into three sections. The first section was the personal information of the sample, the second section contained five factors of the Kalama Sutta Critical Thinking Instructional Model: 1) Train the Mind; 2) Learn the Situations; 3) Observe Assumptions; 4) Verify Morals; and 5) Extend Vision. Each factor consisted of four indicators according to the concepts of the five factors. The last section provided open-ended questions asking for suggestions. The questionnaire was administered to measure 309 teachers' opinions towards the proposed model by employing an Mplus 6.12 statistical package (Muthen & Muthen, 2010) for analyzing data with a second-order confirmatory factor analysis. The researcher finally developed a Critical Thinking Instructional Model based on the Kalama Sutta Approach.

Phase 4: Implementing the critical thinking instructional model

In phase 4, the researcher extended the fourth and fifth steps of the ADDIE Model (i.e., I-Implement, and E-Evaluate).

The sample was 30 Mathayomsuksa 2 students of Thungsuklapittaya "Krungthai Anukroh" School in Chonburi, Thailand, during the second semester of the 2012 academic year, who were selected by simple random sampling. A one group pre-test/post-test research design was used with two instruments: 1) the Kalama Sutta Approach Critical Thinking Lesson Plans (KSACT-Lesson Plans); and 2) the Kalama Sutta Approach Critical Thinking Achievement Test (KSACT-Test). The KSACT-Lesson Plans were checked by three experts in order to verify the accuracy of the objectives, reading tasks, teaching aids, evaluation and teaching procedures. Five lesson plans were employed to teach the target group for 10 periods. The KSACT-Test with 30 items were found to be on the Index of Objective Congruence (IOC) level between .66-1.00, the reliability of .80, the difficulty level (p) between .20-.80, and discrimination (r) higher than .20. The test was administered before and after the 10 periods of instruction. In the Implementing phase, the pre-test/post-test scores were analyzed by comparing the mean scores of the achievement test before and after the instruction. The t-test for

dependent sample means was used to compare the differences of the mean of the pre-test and the post-test. The significance level was set at .05.

Research Results

Research question 1: What is the Kalama Sutta Critical Thinking Instructional Model as a result of the development?

The results of the in-depth interviews were reported in Tables 3-9. The degrees of agreement of coders were displayed as inter-coder reliability at 85-100%.

Table 3. Current problems about fostering students' critical thinking in Thailand

No.	Theme of focused codes	Agreement of coders (%)
1	Not enough Critical Thinking Encouragement from teachers	90%
2	Lack of critical thinking skills of students	92%
3	No concrete policies for fostering critical thinking in schools	85%

Table 4. Elaboration of Kalama Sutta Approach

No.	Theme of focused codes	Agreement of coders (%)
1	Key concept: No rush to believe regarding 10 elements of Kalama Sutta Approach, do not blindly believe.	92%
2	Key words: reason, wisdom, faith, mindfulness, self- practice consider, argue, prove, decide, judge, collect (data), analyze, and test (result)	92%
3	Core teaching: never taught people to be credulous,	87%
4	Process to: find the truth, distinguish good or bad, right or wrong, find causes and effects, solve problem, concern with wisdom, consider before judgment, prove evidence, build up wisdom, think well before decision,	87%

Table 5. Core beliefs of Kalama Sutta Approach

No.	Theme of focused codes	Agreement of coders (%)
1	Key concepts: 1) Don't believe the first time, Don't refuse the first time, Don't believe 100%, Don't refuse without considering, Don't hurry to believe, Don't rush in making a decision, Don't believe even reason of logic, Don't simply believe someone or something immediately, Don't believe easily; 2) Believe with reason , Believe with wisdom, Believe with mindfulness, Believe after consideration	93.%
2	Inquiry methods: thinking over to find the truth, consider cause and effect, prove evidence, listen carefully, think carefully, finding the truth by posing questions	90%

Table 6. Thinking methods of Kalama Sutta Approach

No.	Theme of focused codes	Agreement of coders (%)
1	Thinking with wisdom to clarify good or bad, right or wrong.	86%
2	Thinking carefully and act out with wisdom	87%
3	Thinking with mindfulness to find the truth,	90%
4	Thinking over before making a decision or judgment	92%
5	Thinking positively in every situation	91%

Table 7. Dhamma core & related Dhamma in Kalama Sutta Approach

No.	Theme of focused codes	Agreement of coders (%)
1	Dhamma Cores: Kusala and Akusala, Kamma-kilesa 4, Faith and Wisdom, Greed, Hatred, and Delusion, Mindfulness and Awareness, Wholesome and Unwholesome, Good deeds and Bad deeds	91%
2	Related Dhamma: Yonisomanasikara, The four Noble Truths, The 5 precepts , The Eightfold Path, Brahma vihara 4, Virtue of gentleman 7	87%

Table 8. Application of Kalama Sutta Approach in our daily lives

No.	Theme of focused codes	Agreement of coders (%)
1	Analyzing: news, rumors, social networks, fashion, advertisements, traditions, texts, evidence	94%
2	Evaluating: situations, information, arguments	91%
3	Appraising: people's performance	87%

Table 9. Application of Kalama Sutta Approach in a classroom setting

No.	Theme of focused codes	Agreement of coders (%)
1	Practicing mindfulness	90%
2	Creating situations related to the 10 elements of Kalama Sutta	92%
3	Encouraging critical thinking skills with wisdom	90%
4	Making judgments, decisions, and selection	92%
5	Integration in our daily lives	94%

Table 3-9 indicated: 1) the current problems about fostering students' critical thinking in Thailand; 2) Elaboration of Kalama Sutta Approach; 3) Core beliefs of Kalama Sutta Approach, 4) Thinking methods of Kalama Sutta Approach; 5) Dhamma core & related Dhamma in Kalama Sutta Approach; 6) Application of Kalama Sutta Approach in our daily lives; and 7) Application of the Kalama Sutta Approach in a classroom setting. The inter-coder reliability was at 85%-94%, which was accepted because it reached the expected criterion of the study. The researcher used the data from Table 3 as the supported ideas of how to foster critical thinking for Thai students. The qualitative data in Table 4-9 were integrated into five factors of the proposed model and its indicators, as illustrated in Figure 1.

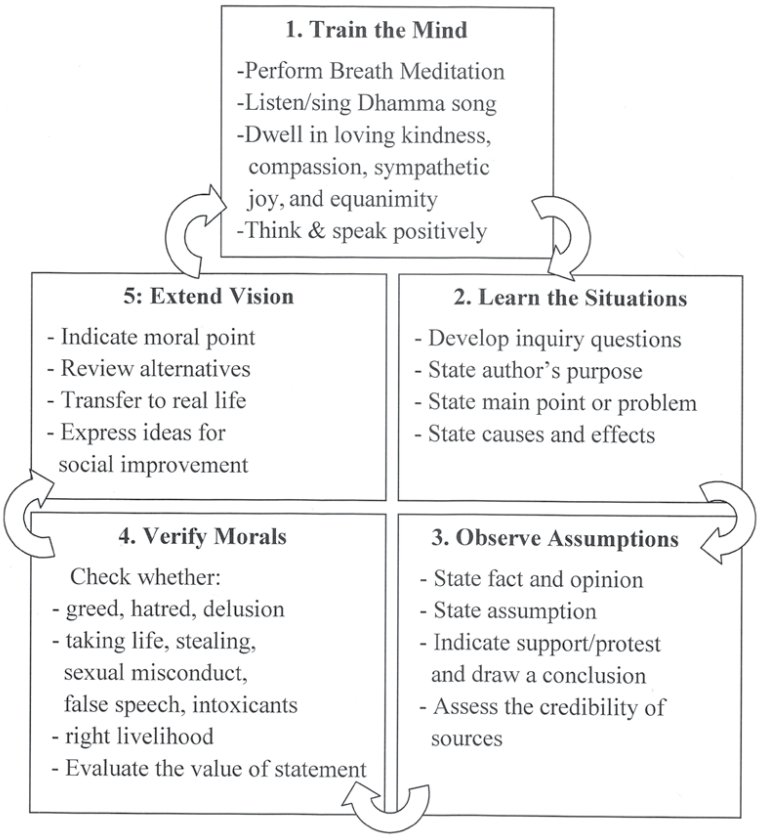

Figure 1. The T- LOVE: Critical Thinking Instructional Model based on the Kalama Sutta Approach

Research Question 2: How well is the Kalama Sutta Critical Thinking Instructional model confirmed by the teachers?

The researcher collected data from 309 teachers of the secondary schools of the Secondary Educational Service Area Office 18 (Chonburi-Rayong) teaching in Mathayomsuksa 1-3 (grades 7-9) which were selected by using multi–stage sampling (Babbie, 2008). The researcher conducted the second-order confirmatory analysis (Rindskopf & Rose, 1988) to examine the samples' responses to the six continuous latent variables and 20 independent variables from 309 observations of the proposed Model by using the Mplus 6.12 statistical package (Muthen & Muthen, 2010).

The research instrument was a questionnaires using a 5-point Likert scale (5 = Strongly Agree, 4 = Agree, 3 = Neither Agree nor Disagree, 2 = Disagree, and 1 = Strongly Disagree), which consisted of five components of the model: 1) Train the Mind; 2) Learn the Situations; 3) Observe the Assumptions; 4) Verify Morals; and 5) Extend Vision. Each component consisted of four indicators. The results of the measurement are illustrated by the following symbols and some acronyms which are described below.

CTIM b KSA refers to the Critical Thinking Instructional Model based on the Kalama Sutta Approach which consisted of five factors: 1) TRA-M refers to Train the Mind; 2) LEA-S refers to Learn the Situations; 3) OBS-A refers to Observe Assumptions; 4) VER-M refers to Verify Morals; and 5) EXT-V refers to Extend Vision.

Train the Mind consisted of 4 indicators (a1-a4): a1 refers to have students do breathing meditation before learning; a2 refers to have students listen or sing the dhamma song before learning; a3 refers to have students share their love-kindness, compassion, sympathetic joy, and equanimity; and a4 refers to have students tell themselves to think and speak positively.

Learn the Situations consisted of 4 indicators (b1-b4): b1 refers to develop inquiry questions; b2 refers to state the author's purpose; b3 refers to state the main point or problem; and b4 refers to state the cause and effects.

Observe the Assumptions consisted of 4 indicators (c1-c4): c1 refers to separate fact and opinion; c2 refers to state assumptions; c3 refers to state details and a conclusion of information; and c4 refers to assess the credibility of sources.

Verify Morals consisted of 4 indicators (d1-d4): d1 refers to check whether greed, hatred, or delusion; d2 refers to check whether take life, steal, sexual misconduct, false speech, or intoxicants; d3 refers to check whether right livelihood; and d4 refers to evaluate the value of the statement.

Extend Vision consisted of 4 indicators (e1-e4): e1 refers to indicate the moral point; e2 refers to review alternatives; e3 refers to transfer to real life; and e4 refers to express an idea for social improvement.

The measurement of the Critical Thinking Instructional Model, based on the Kalama Sutta Approach, is illustrated in Figure 2 below.

x^2= 226.011, df = 131, p < 0.001, /df = 1.725, RMSEA = 0.048, CFI = 0.986, TLI = 0.980, SRMR = 0.026

Figure 2. Measurement of Critical Thinking Instructional Model based on the Kalama Sutta Approach

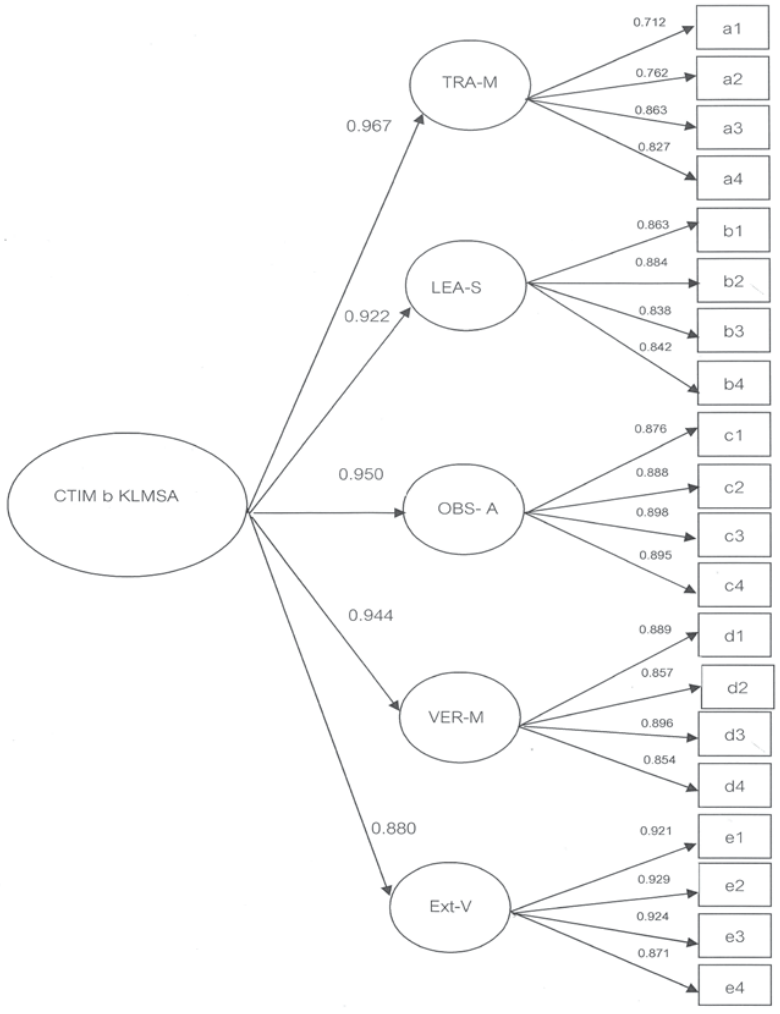

Figure 2 reveals the measurement of model fit, based on empirical data from an analysis of the

Critical Thinking Instructional Model. The chi-square and degrees of freedom obtained from the study analysis were 226.011 and 131, respectively. The chi- square/degrees of freedom was 1.725, which fell into the reasonable fit range. According to Arbuckle and Wothke (1999), the chi-square/degrees of freedom value range of from 2 to 5 indicates a reasonable fit. The Tucker-Lewis Index (TLI) (Tucker & Lewis, 1973) value of close to 1 indicated a very good fit and the comparative fit index (CFI) value of close to 1 also indicated a very good fit (Bentler & Bonett, 1980). The TLI and the CFI values from the analysis were 0.980 and 0.986, respectively, both of which fell into the very good fit category. According to Arbuckle and Wothke (1999), the root mean square error of approximation (RMSEA) value of 0.00 indicates exact fit, and 0.08 or less indicates a reasonable fit. The RMSEA value from the analysis was 0.048, which fell into the reasonable fit category. The Standardized Root Mean Square Residual (SRMR) from the analysis was 0.026 (smaller than 0.05) which fell into the very good fit category, as summarized in Table 10:

Table 10. Fit indicators of the proposed model

Fit indices	Recommended Value	Observed Value	Level of fit
x^2/df	Range of 2 to 5	1.725	Reasonable fit
CFI	Value close to 1	0.986	Very Good fit
TLI	Value close to 1	0.980	Very Good fit
RMSEA	Value .05 or less	0.048	Reasonable fit
SRMR	Value of about 0.05 or less	0.026	Very Good fit

Table 10 indicated a very good fit in three key values: TLI value, CFI value, and SRMR value. The RMSEA value and the chi-square/degrees of freedom value indicated a reasonable fit. In conclusion, the Kalama Sutta Critical Thinking Instructional model met the standard of an effective model.

Research Question 3: How effective is the Kalama Sutta Critical Thinking Instructional Model?

The results answered the two sub-research questions: "Does the Kalama Sutta Critical Thinking Instructional Model enhance students' critical thinking?" and "To what extent does the Kalama Sutta Critical Thinking Instructional Model increase students, critical thinking ability?". The results were tabulated and elaborated in two sections: 1) Differences of Pre-test and Post-test Mean Scores; and 2) Comparison of Pre-test and Post-test Mean Scores, as illustrated in Tables 11 and Table 12.

Table 11. Differences of pre-test and post-test mean scores

Total score	Mean of pre-test Score	Mean of post-test Score	Difference of means
30	8.8	19.73	10.93
Percentage	29.33%	65.76%	36.43%

Table 11 indicates that the mean of the post-test scores (19.73 at 65.76%) is higher than the mean of the pre-test scores (8.8 at 29.33%). The difference of the pre-test and post-test mean scores is 10.93 at 36.43%. The results demonstrated that the Kalama Sutta Critical Thinking Instructional Model did enhance students' critical thinking ability. $\sum D$ $\sum D^2$

Table 12. Comparison of pre-test and post-test mean scores

	N	$\bar{x}$			t	p
Pretest	30	8.8				
			328	3646	41.67*	.00
Posttest	30	19.73				

*p-value <.05

Table 12 indicates that the mean of the post-test scores (19.73) is higher than the mean of the pre-test scores (8.8). The results confirmed that the students taught with the Kalama Sutta Critical Thinking Instructional Model earned a higher critical thinking score than on the pre-test at the .05 level of statistical significance.

Discussion

The T-LOVE: Critical Thinking Instructional Model based on the Kalama Sutta Approach for Thai Teachers consists of five factors:

1. T-Train the Mind refers to the process of clearing the mind in order to be kind in the heart. It is the way to prepare the mind to get ready to think. Since in this world, " the real leader is the mind… if the mind is not good is not clever, it will lead the body to do bad deeds or not clever action" (Somdej Phrasangkaraj et al., 2002, p. 48). According to Jones (2013, p. 1), since "the mind is the master of the body. If we train and discipline our minds, The body will follow" (). Train the mind is the first step of critical thinking. This process is in congruence with the recommendation of Haskins (2013), that the first step of training someone to become an accomplished critical thinker is to adopt the attitude of a critical thinker.

The attitude of a critical thinker is in a set of cognitive skills which is "related to characteristic habits and attitudes" (Ellis, 2008, p. 4). "Develop a critical thinking character" is the first step of the critical thinking model (Alfaro-LeFevre, 2007). According to De Bono (2006, p. 17), "we can instruct our minds to work as we wish. Thinking is a skill that can be improved, if we want to improve that skill". According to Buddhism, mind training means empowering the mind to wise reflection and wise thinking, if we allow the mind to work. According to Green (2005, p. 83), "the human mind is a funny old thing. You must know how to handle the mind skilfully to make it work well for you"(. In conclusion, Train the mind should be the foremost step of developing critical thinking skill, as well as cultivating critical thinking characteristics and critical thinking behaviours.

2. L-Learn the Situations focuses on how people acquire, process, and store information which are the concepts of cognitive psychology. McLeod (2007) stated that cognitive psychology focuses on the way a human processes information, looking at how we treat information that comes into the person, and how this treatment leads to responses. The responses to the information or situations, people reflect by: accepting or rejecting; believing or not believing, because critical thinking is "the cognitive activity associated with the evaluation of products of thought" (Yinger, 1980. p. 14).

The main concept of critical thinking, based on the Kalama Sutta Approach, is "reflective skepticism" (McPeck, 1981, p. 7). According to Phra Dhammapitaka (2002, p. 232), the Kalama Sutta Approach refers to how to deal with the 10 doubtful matters doctrine: 1) Be not led by reports; 2) Be not let by tradition; 3) Be not led by hearsay; 4) Be not led by the authority of texts; 5) Be not led by mere logic; 6) Be not led by inference; 7) Be not led by considering appearances; 8) Be not led by the agreement with a considered and approved theory; 9) Be not led by seeming possibilities; and 10) Be not led by the idea, "This is our teacher". Since the core of Kalama Sutta originated from doubt, as in the discourse of the Lord Buddha tothe Kalama people, "…it is proper for you, Kalama, to doubt, to be uncertain…" (Thera, 2013). The state of "doubt" or "uncertainty" convinces someone to listen carefully, and that can lead him or her to the first stage of wisdom.After that, if s(he) keeps thinking carefully on the target context, s(he) soon reaches the second stage of wisdom. Finally, s(he) can act out with wisdom at the third step of wisdom. In conclusion, learning the situations is the process of how people perceive, learn, think about information, and act out, according to what they believeas "the idea of information processing" (McLeod, 2008, p. 1).

3. O-Observe Assumptions refers to the step of proving whether something is true. According to Buddhadasa Bhikkhu (1988, p. 3), the Lord Buddha taught us not to accept or believe anything immediately just because it fits with any of a number of criteria, but "after reasoned reflection and the test of practice… the greatest uniqueness of Buddhism that keeps its practitioners from being anybody's intellectual slave." This step of the proposed model is the strategic method to find the truth which is the most important part of inquiry, as stated in the idea of My Father's

World (2012, p.1), "Critical thinking is the process of thinking that questions assumptions". According to Brookfield's perspective (2011, p. 14) about assumptions: "Life is a series of decisions, some small, some much large... all decisions are based on assumptions." In our real lives, we all face the assumptions all the time, we should practice how to observe the assumptions by asking clarifying questions, expressing reasoned arguments, and identifying precise conclusions in order to judge the credibility of sources. In addition, we need critical thinking skills to "look for and find hidden assumptions, and trace the consequences of a claim" (Moore & Parker, 1986. p. 5).

4. V-Verify Morals refers to the morality check. In this proposed model some Buddhist Dhamma cores are recommended as tools for verifying morals for general lay people in order to check the balance of their lives. For instance, the five precepts or Sila 5 (to abstain from killing, stealing, sexual misconduct, false speech, and intoxicants) is a great tool for checking whether there is right or wrong in people's behavior. It can be put into practice by everyone, since people everywhere have the same problem: to free themselves from suffering which stems from greed, hatred, and delusion. Moreover, some points of the Eightfold Path are also good in verifying morals, such as checking the case study of whether Right Livelihood or Right Work or Right Effort. Verify morals plays an important role in critical thinking, because critical thinking is "the process by which we test claims and arguments, and determine which have merit and which do not" (Ruggiero, 2001, p. 16). The ability to indicate a moral point or verify morals is the process of Khit Pen Ability. According to the Office for National Standards and Quality Assessment (ONESQA) (2011) (B.E. 2554-2558), the fourth KPI focuses on thinking capacity: Students should have Khit Pen Ability and Thum Pen Ability (i.e., it means they can think and can do with the two indicators: thinking capacity, and adjusting capacity to live with the others (ONESQA, 2011, p.20)). Furthermore, the Bureau of Educational Testing, Office of the Basic Education Commission (2012, p. 3) recently launched the principles of a holistic learner development including body, mind, intelligence, knowledge and virtues. Learners should live morally and happily with others.

5. E-Extend Vision refers to the final process of the proposed model. The final goal of Learning Critical Thinking is to draw a conclusion as having been a good decision or good judgment, as well as the skills to "appraise situation, investigate statement, evaluate statement, development of viewpoint, adjust attitude and behaviour (Moonkam, 2005, p. 16). In this discussion, Charoernwongsak (2002, pp. 5-6) suggested the process of critical thinking from "a trigger event, appraisal, exploration, development of alternative perspectives, and integration" in our daily lives. In addition, the Foundation for Critical thinking (2012, p. 1) indicated the eight elements of critical thinking and the final element is "implications and consequences…implications follow from thoughts, consequences follow from actions…the best thinkers think through the logical implications in a situation before acting." The ideal critical thinker "must be able to assess reasons and their ability to warrant beliefs, claims and actions properly" (Siegel, 1990, p. 38). From the results of the discussion, the conclusion is that the final part of critical thinking should be the fruitful production of thoughts that can benefit the thinker, others, and social improvement.

Recommendations

The findings demonstrated that the Kalama Sutta Critical Thinking Instructional Model was effective to enhance students' critical thinking skills. Therefore, the educational authorities or someone who may be concerned should encourage or support teachers to develop their learning unit, based on the critical thinking model, to enhance students' critical thinking ability. In addition, this model could help promote the National Test Score such as the O-Net, since the O-Net Test focuses on the real life situations and critical thinking skills. For empowering students to be critical thinkers, the school should develop an extra curriculum, the "critical thinking curriculum" and create "the critical thinking course" in order to encourage students' critical thinking abilities. Apart from the promotion of critical thinking in schools, there should be more critical thinking activities in other arenas that will help increase people's wisdom which can be transferred to their daily lives.

Conclusion

Based on the assumption that critical thinking can be taught or trained in order to make more critical thinkers in our society, the T-LOVE model: Critical Thinking Instructional Model based on the Kalama Sutta Approach has been found to be an effective tool for empowering students to efficiently apply to their daily lives. Since the core of the Kalama Sutta Approach focuses on how to believe with mindfulness and wisdom, they will develop their own principled thinking for protecting their lives against blind beliefs and they will not be misled by the wrong information. The researcher strongly hopes this study will function as an alternative source of motivating the desired characteristics of the young generation of Thailand.

REFERENCES

Alfaro-LeFevre, R. (2007). 4- circle thinking (CT) model. Retrieved July 18, 2011, from http://www.alfaroteachsmart.com/handouts/ClinicalCards.pdf

Arbuckle, J. L. & Wothke, W. (1999). Amos4.0 user's guide. Chicago, IL: Small Waters Corporation.

Babbie, E. (2008). The basics of social research. Belmont, CA: Thomson Wadsworth.

Bentler, P. M. & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of convariance structures. Psychological Bulletin, 88, 588-606.

Brookfield, S. D. (2011). Teaching for critical thinking: Tools and techniques to help students question their assumptions. San Francisco: Jossey-Bass.

Buddhadasa Bhikkhu. (1988). Help! the Kalama Sutta, Help! Retrieved January 3,2012, from http://www.dhammatalks.net/Books5/Bhikkhu_Buddhasa_

Charoernwongsak, K. (2002) Critical thinking. Bangkok: Success Media.

Cosgrove, R. (2009). Critical thinking in the Oxford Tutorial. Master's thesis, Department of Higher Education, University of Oxford.

Creswell, J. W. & Clark, V. P. (2007). Designing and conducting mixed methods research. Thousand Oaks, CA: Sage.

De Bono, E. (2006). Thinking course. London: BBC Active.

Ellis, J. (2008). My model of critical thinking. Retrieved November 20, 2011, from http://jeffreyellis.org/blog/?p=60

Foundation for Critical Thinking. (2012). Model for learning the elements and standards of critical thinking. Retrieved May 27, 2012, from http://www.criticalthinking.org/ctmodel/logic-model1.htm

Green, S. P. (2005). Einstein questions, Buddha answers. Pathumthani: Skybook.

Haskins, G. R. (2013). A practical guide to critical thinking. Retrieved March 7, 2013, from http://skepdic.com/essays/Haskins.htm

Jones, R. (2013). Train your Mind and the Body will Follow. Retrieved April 26, 2013, from http://www.articleinterchange.com

Mason, M. (2007). Critical thinking and learning. Education Philosophy and Theory, 39(4), 339-349.

McLeod, S. A. (2007). Cognitive approach in psychology. Retrieved June 2, 2013 from http:// www. Simple psychology. Org/cognitive.html

_____. (2008). Information processing. Retrieved June 5, 2013 from http://www. Simpleypsychology. Org/cognitive.html

McPeck, J. E. (1981). Critical thinking and education. New York: St. Martin's Press.

Miles, M. B. & Huberman, A. M. (1994). Qualitative data analysis: An expanded sourcebook (2nd ed.). Thousand Oaks, CA: Sage.

Moonkam, S. (2005). A strategy for critical thinking teaching (3rd ed.). Bangkok: Duangkamomsamai.

Moore, B. N. & Parker, R. (1986). Critical thinking: Evaluating claims and arguments in everyday life. California: Mayfield.

Muthen, L. K. & Muthen, B. O. (2010). Mplus statistical analysis with latent variables user's guide (6th ed.). Los Angeles, CA: Muthen & Muthen.

My Father's World (2012). Critical thinking> critical thinking in MFW? Retrieved May 12, 2012, from http://board.mfwbooks.com/viewtopic.php?

Office of the Basic Education Commission. (2012). Basic education standards and childhood education standards for schools' internal quality assurance Bangkok: The Agricultural Cooperative Federation of Thailand

Office for National Education Standards and Quality Assessment (Public Organization). (2011). Manual of the third round of the external quality assurance for basic education (B.E. 2554-2558). Bangkok: Matchpoint.

Phra Dhammapitaka (P.A. Payutto) (2002). Buddhist dictionary, part II Thai-English. Bangkok: Sahathamic.

Rindskopf, D. & Rose, T. (1988). Some theory and applications of confirmatory second-order factor analysis. Multivariate Behavioral Research, 23(1), 51-67.

Ruggiero, V. R. (2001). Beyond feeling: A guide to critical thinking. Mountain View, CA: Mayfield .

Ryan, G.W. & Bernard, H.R. (2013). Techniques to Identify Themes in Qualitative Data. Retrieved April 1, 2013 from http:// www. Analytictech.com/ mb870/readings/ryan-bwenard_ techniques_to_identify_themes_in.htm

Saldana, J. (2009). The coding manual for qualitative researchers. London: Sage.

Siegel, H. (1990) Educating reason: Rationality, critical thinking and education. London: Routledge.

Somdej Phrayanasamvara, Somdej Phrasangkaraj Sakonmaha Painayok (2002). Wisdom guidebook. Nakhon Pathom: Mahamongkut Ratcha Wittyalai.

Thera, S. (2013). Kalama Sutta The Buddha's charter of free inquiry. from the Pali. Retrieved June 9, 2013, from http://www.accesstoinsight.org/lib/authors/soma/wheel008.html

Tucker, L. R. & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. Psychometrika, 38, 1-10.

Yinger, R. J. (1980). Can we really teach them to think? In new directions for teaching and learning: Fostering critical thinking. San Francisco: Jossey-Bass.