Adopting the Six Thinking Hats to Develop Critical Thinking Abilities through LINE

Visara Ekahitanond

Bangkok University, Thailand

Abstract

Today's technology allows easier understanding of course activity and increasing motivation to learn. The Six Thinking Hats model, combined with the use of social media to enhance critical thinking abilities of learners. This framework is considered to be effective in promoting motivation and encouraging interaction between learners and teachers as well as among peers. This study was quasi-experimental research that compared critical thinking abilities and motivation between groups of learners being taught through small group discussions with and without the support of the Six Thinking Hats in social media respectively. The instruments in this study comprised tests, a questionnaire, and an open-ended question. The findings indicate that students in the experimental group achieved significantly higher critical thinking abilities than those in the control group. Also, motivation was statistically found to be higher in the experimental group after the intervention. That is, the use of the Six Thinking Hats in LINE online chat system was more effective in improving learner motivation. The results from the open-ended question reveal that the students were very satisfied with the Six Thinking Hats technique, movie clips, and the use of LINE as a learning tool.

Keywords

critical thinking, LINE, discussion, six thinking hats

Introduction

Numerous curricula and approaches in teaching and learning process have been explored to improve English proficiency but the Office of National Education Standards and Quality Assessment (ONESQA) in Thailand reports that more than 50 per cent of Thai educational institutes nationwide administered insufficient instruction (Phothongsunan, 2014). They also found that the student-centred approach, learning activities to stimulate creativity and critical thinking skill is rarely found in the learning process. Open-mindedness, endurance, humanistic behaviours, and scientific knowledge are values to be instilled in students. Educators should apply critical thinking models in the learning setting to design and create a student-centred learning environment that can promote students' critical thinking skills. The purpose of today education is to prepare students with the ability to think flexibly, perceive from different views, accept differences, and adapt themselves to the fast-changing world. Learning activities should connect students with the real world outside classroom together with developing high-level thinking skills such as analysis of meaning, interpretation, identification of bias, generalization, synthesis, reasoning, and evaluation (Anderson & Krathwohl, 2001). Creativity involves identifying difficulties and searching for solutions through a thinking process such as problem interference, knowledge deficits, missing elements, and inconsistency. Critical thinking can be regarded as reflective thinking and includes high-level thinking processes with basic thinking skills, discussion, expression of individual belief (Horng et al., 2007). Both creative and critical thinking skills harmoniously complement each other to identify and analyze challenges, dilemmas, paradoxes, and opportunities (Treffinger, Isaken, & Stead-Dorval, 2006).

The Six Thinking Hats

After a review of the literature about critical thinking, I have adopted the six thinking hats model developed by Edward de Bono as a creative teaching method. It was used as an educational tool to provoke students' critical and creative thinking. Edward De Bono advocates that complexity or thinking of various things at the same time prevents people from staying focused, and ponder. Therefore, he proposes the 'six thinking hats' model, which is a thinking system leading an individual in a specific direction at a time (De Bono, 1997). The 'six thinking hats' mode is designed to use six different coloured hats which symbolize different points of view (Goebel and Seabert, 2006). It is a notion involving six imaginary hats to help with decision-making. Each hat signifies a role that each wearer has to play.

The six thinking hats (white, yellow, black, red, green, and blue) are represented in the systematic thinking process. Through this learning method, students are guided to perceive situations through different angles of thinking, and to practice and create new knowledge that elevates their abilities in creativity, synthesis, problem-solving, and critical thinking. Students are provided with opportunities to share opinions and feelings and to think creatively and critically (De Bono, 1997). Six thinking hats enhance performance rather than self-defence. Each individual's thinking of particularly challenging issues is presented, which aids a stronger solution (Mitez, 2012).

The use of six thinking hats thinking tool is unlike Bloom's taxonomy, which is based on lower to higher order levels of thinking skills respectively. The six thinking hats model has no definite organization (House et al., 2011). It simply allows thinkers to think and manage their own learning as it provides defined thinking manners, enabling to think and deal with issues sequentially, together with shifting in thinking (Kruse, 2010).

Table 1: Comparing the six thinking hats theory with the revised Bloom's taxonomy

Bloom's Taxonomy	Six Thinking Hats	Thinking skills
Creating	Green Hat*:* Creativity	Generating new ideas
Evaluating	Blue Hat: Thinking about thinking	Justifying a decision
Analyzing	Black Hat*:* Judgment	Exploring information to understand
Applying	Yellow Hat: Benefits	Using information in another similar situation
Understanding	Red Hat: Feelings	Explaining ideas
Remembering	White Hat: Information	Recalling information

Small Group Discussion

Small group discussion is a means to promote learning convenience and trigger mutual learning among students (Bennett, Lubben, Hogarth, and Campbell, 2004). When students get the idea of group discussion manners, they are supposed to reflect their personal opinion, handle hypothesis and possible conflicts by reasoning, discussing, debating, reviewing received information. Therefore, teachers' guidance plays a significant role in preparing students' readiness to use materials for discussion. Clarity in learning materials, course directions, teacher's expectation, practice, and teacher's supervision are meaningful factors towards students' promising achievement. Dörnyei (2001) advocated that when teachers encourage students' thinking and more effort, the higher the possibility for success can be expected. Teachers can also highlight what students have learned rather than putting emphasis on grades, marks or comparing students' performance with others in the class. Although a large-sized class can be an obstacle, it is challenging for teachers to closely guide and facilitate each group. Therefore, key persons to facilitate the debate can be group leaders who are more mature and thoughtful students. Their roles are to ask questions to confirm understanding and questions relating to what is overlooked, unseen, or in different perspectives. Personal criticism must be avoided, students learn, think, and share their opinion better in an open, positive, and trusting environment. The word "wrong" should not exist in such a small group discussion setting. It discourages beginning thinkers and their further participation. There are so many ways to lead students to look in another way. Words of encouragement like "interesting", "You are on the right track.", "Much better", "Good thinking", "Way to go!", and "keep up the good work" can build up a thinker.

The Use of LINE as a Platform for Discussion

At the present time, information and communication technologies (ICTs) has significantly influenced on students' learning engagement (Greenhow & Robelia, 2009). Online chat applications such as LINE become a popular and useful tool to facilitate instruction, learning, communication, and interaction in a course. These social networking channels can practically function as a platform for learners' discussion and cooperation (Palloff & Pratt, 2007;

Gabarre & Gabarre, 2013). LINE application, allowing informal instant communication in the classroom, is easily-accessed and friendly-user appropriate for ESL learners to increase their English proficiency through on-line chatting (Gonzalez, 2003). When students' learning styles are clearly defined and managed, conversational skills tend to promisingly increase (Hesieh, 2011; Hsu, 2007). LINE offers voice calls and messages to everywhere and at all time. According to Horwitz (2012), millions of users are using LINE worldwide. LINE has been the most popular in many countries, including Thailand. The free application is used to communicate between teachers to students and students to students. Efficacy and skills can be enlarged, when students' interaction with teachers and peers increases. Interestingly, students' critical thinking ability becomes elevated due to knowledge building through the learning process of social constructionism. Response to teacher questions and peers' comments happen more swiftly and effortlessly as compared to traditional writing on paper. The chat app facilitates more connection, participation, collaboration, and liveliness in learning activities.

Furthermore, the learning atmosphere on the LINE chat app appears more casual and relaxing options than a traditional classroom setting where personal confrontation is considered threatening, especially in Asian culture. Accepting and becoming "friends" on LINE creates a sense that students welcome teacher into their personal space. Emoticons, stickers, characters revealing a variety of moods lessen the distance between teacher and students. Stapa and Chaari (2012) mention that emoticons help enliven written messages. According to Wee (2013), LINE characters manifesting facial expressions display users' personalities, feelings and attitudes. Thus, it is very beneficial for EFL students who can find another non-verbal alternative to participate in learning activities and freely express who they are, what they think, and how they feel. The social interaction on LINE group usefully serves academic purposes as it offers great opportunities for teachers to monitor and examine students' dialogue with their peers (Mazur, 2004).

Line is generally functioned as a discussion platform; thus, it was applied as a learning tool in this course through teacher's discreetly-selected inquiries and students' thoughtful responses. Black (2005) mentioned that online discussions possibly provoke student review and questioning and stimulate a collaborative learning atmosphere together with cogitation and critical thinking. Benefits are promising when critical thinking and language mastery are fostered through the use of LINE as a learning tool in which students are actively and daily engaged. LINE provides a text-based platform for students to intellectually participate, easily interact, and promptly respond to teacher points of discussion.

Many preceding studies related to critical thinking development through online discussions displayed possibilities for critical thinking, resolution, and active group collaboration (Al-Fadhi&Khalfan, 2009; Ekahitanond, 2013; Marra, Moore, & Klimczak, 2004). Inducement has been ascertained as significant to a favourable outcome in online forums (Antino, 2008) because this major force drives a learner to make every effort to the finishing line (Reeve, 2005). Furthermore, motivation constructively impacts social interaction among peers in online platforms(Yang et al., 2006).

Numbers of relatively new reports regarding online learning activities show insightful and effective evidence in increasing students' motivation (Mockus et al., 2011; Olasina, 2012). A research study differentiates statistical significance with respect to subjective incitement, with a greater extent attained by students in the experimental group provided by the online learning instruments than students in the control group with no support of online tools (Chaiprasurt & Esichaikul, 2014).

In the notion of constructivists, online learning is more effectively employed in the student-centred online discussion. To reinforce students' critical thinking skills in the present study, the model of six thinking hats and LINE, the most favourite instant messaging communication for Thai students, are consolidated into a designed learning process. The purposes of the investigation are to examine the effectiveness of critical thinking in LINE and students' attitude towards the overall course. Even though learner-to-learner interaction fashions more freedom and independence in discussion and analysis of thoughts (Seo, 2007), the course furnishes both learner-to-learner and student-to-teacher reciprocal communication in expectation of more benefiting learners. Teacher advice can guide and provoke students to reorganize, review, interpret, and synthesize information and thoughts (Wang, 2009). The outcome of the study can bring about a practical learning track to increase students' discussion skills; language and critical thinking abilities. Thus, the following four research questions are:

Research Question 1: To what extent did the students improve their critical thinking abilities after they joined the activity of the six thinking hats in LINE?
Research Question 2: Did the students in the experimental group gain better critical thinking abilities than those in the control group?
Research Question 3: Did the students in the experimental group have a higher motivation than those in the control group?
Research Questions 4: How did the students respond to the activity of the six thinking hats in LINE?

Methodology
The quasi-experimental research was implemented with Bangkok University sophomores enrolled in EN340 in the first Semester of 2015 academic year. The students were systematically assigned to their sections by the Records Office; therefore, a random selection of samples out of the population was unfeasible. However, two sections of 40 students each were selected as a control group and an experimental one. The teaching method was the independent variable, whilst the students' critical thinking capability together with their learning motivation was the dependent variables.

Research Instruments
Three instruments were used in the study. The first instrument was the tests administered to assess students' critical thinking abilities in both groups. They were created by the researcher. One test was given at the beginning of the term functioning as the pre-test and the second one as the post-test at the end of the experiment. Both tests contained a movie clip, each of which contained six questions to provoke students' critical thinking. So, the total score for grading in each test was 30 points. The scoring rubric was used to grade students' answers as follows:

Table 2: Scoring Rubric for Assessing Critical Thinking Abilities

	0-1	2-3	4-5
Comprehension	Misunderstanding or trivial issues mentioned	Adequate information and understanding	Clear, accurate, complete, detailed, and comprehensive statements
Reasoning	None or few reasons with no supporting evidence	A few reasons with some supporting evidence	Convincing reasons with clear, specific, and logical supporting details

Analysis	No evidence or superficial and unclear recognition of hidden meaning, with limited supporting reasons	Adequate recognition of hidden meaning, with some convincing or supporting reasons	Clear and deep recognition of hidden meaning with convincing supporting reasons together with different viewpoints and deep interpretation
Egocentricity	Superficial conclusion with bias and personal preference	Adequate ability to take ideas further into new territory, broader generalizations with ego centricity or a few reasons	Surprising, insightful, deep, and thoughtful ideas further into new territory, broader generalizations with sound reasons
Creativity	No evidence	Some creative ideas	Clearly seen
Decision-making ability	No ability to assess discriminatively the value or with most of egocentric and trivial points	Adequate ability to assess discriminatively the value or/with some egocentric reasons	Clear ability to assess discriminatively the value without egocentricity, giving reasons with broad points of view together with concrete, valid, and justifiable evidences.

The second instrument was a questionnaire which was adapted from Keller's Instructional Material Motivational Survey (IMMS, 1999). It was used for examining all students' learning motivation towards the course. It consisted of 13 items, appearing in form of a Likert five-rating scale (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree). The questionnaire was distributed to both groups at the end of the course. As for the third instrument, only students in the experimental group were asked to provide feedback in an open-ended question with one question "What do you think about joining the activity in LINE?"

Validity and Reliability of the Instruments

The items of the draft questionnaire were checked for content validity by the three experts in the English teaching field. The items with an IOC index higher than 0.60 were acceptable. In order to test the proper reliability of the questionnaire, the questionnaire was piloted with 35 undergraduate students who were not the target group, and calculated for proper reliability value by using Cronbach's Coefficient Alpha. The Coefficient Alpha of 0.89 indicated that all items were acceptable.

Data Collection and Analysis

To collect data, small group discussion tests were administered before and after exposing students to the treatment. The pre- and post-test mean scores in each group were compared by using dependent samples t-tests to reveal changes in critical thinking abilities. Then the post-test scores of the two groups were compared using an independent samples t-test. After the intervention, students in both groups were required to do the motivational questionnaire. Data

collected from both groups were compared using an independent samples t-test. In addition, responses from an open-ended question received from the experimental group were categorized and presented with some quotes.

Teaching and Learning Process
It was an obligation for all students who studied EN340 to have a small group discussion. The course employed movies as an educational tool. In this regard, background knowledge and personal experiences are required and integrated. As to enjoy and understand a story, the audiences need to know its historical backgrounds, social values, political and economic situations, and contextual information to some extent (AAAS, 1989).Such tool entitles students to administer their previous knowledge and search for new knowledge to serve their curiosity, which is pertinent to the case study creating new knowledge and discover new concepts. Movies help students expose to real-life and complicated scenarios with opportunities to exchange opinions and discuss with others, leading to active and reflective learning. Many good movies are meaningful, realistic, inspiring by promoting teamwork and accountability (Tomey, 2003). Movies are useful to provoke students, widen their understanding, promote self-driven learning, and develop information assessment skills (AAAS, 1989). King (1999) advocates the structure and guiding questions to develop a thinking process to elevate critical thinking abilities. King also believes that a critical thinker possesses an inquiring mind. Students should be trained to question as a routine, which is a practically useful tool to scrutinize their daily activities and what seen on TV and social media. Inquiry is employed as a powerful teaching strategy for increasing critical thinking in the classroom and is auspicious.

Thought-provoking questions permit students to go deep and beyond what is superficial. Once students ask such questions, critical thinking is promising to take place (King, 1999). When asking themselves and peers, these questions will hype critical thinking in both the questioner and the listener, and boost high-level cognitive processes such as investigation, reasoning, analysis, interpretation, inference, comparison, valuation, assessment, and the like. Thus, it is worth doing for both teachers and students to exploit the thought-provoking inquiry technique.

This empirical study was carried out in two classes where the researcher was the teacher. The data collection was done for 14 weeks. For the pre-instructional period, the subjects in the two groups were pre-tested to determine their critical thinking abilities and introduced to a supplementary sheet concerning how to discuss the given topics.

Students in the experimental group had small group discussions in LINE. They were taught about how to respond to the questions based on the six thinking hats in the classroom during week 2 and 3. The content delivery approach which was employed in this study included the use of movie clips. These clips can add both entertainment and value to the class. Students in the experimental group were required to create a group of six in LINE where the teacher would post the questions while they had to give responses to each question. All students had to participate in the activity for 5 weeks starting in week 4. In every two weeks (week 5, 7, 9, 11, 13), the teacher posted movie clips followed by questions that challenged the students to discuss and answer them by using the Six Thinking Hats model to achieve better discussion ability. The well-selected movies used for the discussion practice were Dead Poet Society, Happy Feet, Her, Bat Man, the Dark Knight, Bicentennial Man, and Green Miles. Students in each group were assigned to put one hat and answer the questions given. The movies, at some points, facilitated students to think from different sides, away from egocentricity. Each posted question required a response in a well-thought-out sentence or paragraph. The response

messages were supposed to show how the students could think critically. In this activity, the teacher acted as a facilitator who often read students' writing and gave suggestions about points of view. This provided an opportunity for mutual learning and introduced students to new perspectives, which can help them gain more insightful and accurate comprehension (Waterman & Stanley, 2004).

However, in comparative design, students in the control group were not exposed to the treatment regarding the model of Six Thinking Hats. They regularly practised of small group discussion in a class where teachers facilitated, monitored and supervised each group's discussion. The questions for discussions were not different from those in the experimental group. The students were given some examples of general thought-provoking questions to formulate their own questions. The teacher allowed the students to spend time brainstorming, thinking, discussing, and exchanging ideas. Spontaneously reciprocal peer questioning, cooperative learning, inquiring minds were applied. The teacher's role was to give a hint or point out other views with critical-thinking questions that triggered and activated students' critical thinking. The questions used to stimulate students to search for other overlooked points to reconsider plausible answers and alternative resolutions were such as "What are the strengths and weaknesses of …?" "What would happen if…?" "How about comparing…and…with regard to…?" "What evidences are there to support your group answer?" "Are there other creative possibilities to solve the problem?" "Explain why…" "What does….mean?" "What are another ways to look at…?" These questions induced the students to high-order thinking, analysis, inferencing, comparison and contrast, activation of prior knowledge, application, evaluation, and provision of evidence. Having carefully discussed from different points of views in each group, the students concluded their group answers and submitted to the teacher. The intervention period for both groups took place during weeks 2-13. Then in week 14, two groups were post-tested. Then the questionnaire was distributed to students in both groups. The rubric used is adapted from Development of Two Measures of Learner Motivation by John Keller, Florida State University.

Findings

Research Question 1: To what extent did the students improve their critical thinking abilities after they joined the activity of the six thinking hats in LINE?

To investigate whether the students improved significantly in their critical thinking abilities, the pre- and post-test mean scores were compared by using paired samples t-tests. Before the intervention, the writing mean scores of students in the control group and the experimental group were 15.00 and 15.02 from 30 points, and those scores increased to 18.02 and 19.85 respectively after the intervention. From a t-test analysis, the post-test mean scores of students in both groups were significantly higher than the pre-test mean scores. This means that the students improved their critical thinking abilities no matter what method they studied with. However, it is noted that students in the experimental group gained more critical thinking than those in the control group.

Table 3: A Comparison of Pre-test and Post-test Mean Scores of Students in Both Groups

Group		Pre-test	Post-test	t
Control group (n=40)	Mean	15.00	18.02	-15.06*
	S.D.	2.97	3.33	

Experimental group	Mean	15.02	19.85	-18.19*
(n=40)	S.D.	2.84	2.92	

*p< .05

Research Question 2: Did the students in the experimental group gain better critical thinking abilities than those in the control group?

In order to confirm the participants assigned to both groups were not initially different but homogeneous, an independent samples t-test was run. From a t-test analysis, the pre-test mean score of students in the control group (M = 15.00, SD = 2.79) was nearly equal to that of the experimental group (M = 15.02, SD = 2.84), but the result shows no significant difference between the two groups (t = -.04, df = 78, p = .97). Therefore, it was concluded that the two groups were homogenous at the outset of the study.

The result demonstrated that the post-test mean score of experimental group (M = 19.85, SD = 2.97) was higher than that of the control group (M =18.02, SD = 3.33). To find out whether the experimental group outperformed the control group, the post-test mean scores were compared by using an independent samples t-test. It was found that the mean score of the experimental group was significantly higher than the control group at the level of .05 (t = -2.58, p< .05).

Table 4: A Comparison of Post-test Mean Scores of Students between Both Groups

Group	**Mean**	**S.D.**	**df**	**t**
Control group (n=40)	18.02	3.33	78	-2.58*
Experimental group (n=40)	19.85	2.97		

*p< .05

Research Question 3: Did the students in the experimental group have a higher motivation than those in the control group?

In the control group, it was found that the third highest mean scores were no. 6 (I think that the grades are fair when compared to others, M = 4.33), followed by no.2 (What I am learning will be beneficial to me., M = 4.20) and no. 1 (I realize the instructor's effort in making us feel energetic about the course., M = 4.18). However, the item that had the lowest mean score was no. 8 (My creativity has been increased through the learning of this course, M = 3.65). Students in the experimental group expressed their motivation to learn on no.3 the most (The instructor makes the course look important, M = 4.65), followed by no. 2 (What I am learning will be beneficial to me, M = 4.58), and no. 1 (I realize the instructor's effort in making us feel energetic about the course, M = 4.53). The lowest mean score was on no. 9 (I like the instructor's interesting or surprising things, M = 4.22).

Table 5: Means and Standard Deviations of Learning Motivation Shown in Two Groups

	Control		**Experimental**	
Statements	**Mean**	**S.D.**	**Mean**	**S.D.**

1. I realize the instructor's effort in making us feel energetic about the course.	4.18	.75	4.53	.51
2. What I am learning will be beneficial to me.	4.20	.65	4.58	.59
3. The instructor makes the course look important.	4.13	.76	4.65	.53
4. The instructor creates excitement and curiosity when leading to the main message.	4.05	.60	4.43	.67
5. I realize that I feel satisfied with the course more than what I thought.	3.83	81.	4.43	.71
6. I think that the grades are fair when compared to others.	4.33	.83	4.50	.68
7. My critical thinking skill has been increased through the learning of this course.	3.88	.56	4.28	.60
8. My creativity has been increased through the learning of this course.	3.65	.48	4.38	.74
9. I like the instructor's interesting or surprising things.	3.90	.78	4.22	.70
10. I think the students are active to this class.	3.70	1.02	4.25	.74
11. The instructor teaches with various interesting techniques.	4.03	.73	4.47	.60
12. I am often curiously provoked by the questions or the problems related to the subject matter in this class.	3.90	1.01	4.25	.63
13. I think the challenge level in the course is about right: not too easy not too hard.	4.15	.77	4.35	.62

Table 6 shows that students in both groups had high levels of the overall motivation. Students in the experimental group seemed to have more motivation than those in the control group (M = 4.40, M = 3.99). The result from an independent t-test analysis indicates that the students in the experimental group had a higher motivation than those in the control group (t = -4.53, p < .05).

Table 6: A Comparison of Learning Motivation of Students between Both Groups

Group	Mean	S.D.	df	t
Control group (n=40)	3.99	.45	78	-4.53*
Experimental group (n=40)	4.40	.36		

*p< .05

Research Questions 4: How did the students respond to the activity of the six thinking hats in LINE?

The replies gained from the open-ended question revealed many interesting issues. Since this course introduced students' new experiences of learning and discussion together with igniting curiosity, creativity, and tolerance to the difference, students' responses were positive. The model stimulated and improved students' communication, critical and creative thinking skills. Everyone was encouraged to participate and share his/her ideas with confidence that their out- of- the- box perspectives were more than welcome. Movies as a learning tool were useful, entertaining and inspiring.

The followings are students' responses to the open-ended question given after the course showing that they developed their critical thinking.

> "We can exchange and learn from different ideas, and think in different ways.

> "My views have been changed. I enjoyed more chances to talk with friends and tried to understand different points.

> "I realized there were various ways to think, interpret, analyze or solve a problem."

> "It is nice to learn to work as a team. I like the Six Thinking Hats technique".

Students also mentioned the development of language skills, vocabulary, listening skill, and their confidence in expressing themselves.

> "I think my listening skill gets better when watching movie clips."

> "I am more confident to express my mind. Teacher encouraged us not to worry about grammar, but to think out of the box."

> "My vocabulary increased."

In term of their attitude towards such learning in the course, many of them expressed their enjoyment.

> "I love the course, felt like not studying, but enjoying myself."

> "I learned many things like cultures, vocabularies, how to think through movies and the Six Thinking Hats technique."

> "I learned real language of native speakers through movies."

> "I was inspired and love to see various life styles and interesting situations from movies. These helped me to think in a way I never thought, and want to search for ways to solve problems."

Technology motivated the students to learn as they mentioned the use of LINE in the course as follow:

> "I am comfortable with LINE because I use it all the time. Learning through LINE is enjoyable."

> "LINE is my favourite application, easy to use."

"When using LINE, I can send stickers to express how I feel, I think it is better, easier, and faster than my writing."

"Everyone uses LINE. We prefer LINE because it is easy to access."

However, the replies also indicated some drawbacks as perceived by some students as follow:

"I felt uneasy to work in a small group with some friends".

"It consumed lots of time and energy to think."

"I prefer more of Teacher's help".

Discussion

The current study investigated the potential of the Six Thinking Hats in developing critical thinking abilities through LINE. The quasi-experimental study was designed to compare learners' critical thinking skill and motivation in an advanced course with and without the support of the Six Thinking Hats conducted on social media. The study reveals that students who got the learning support gained higher critical thinking abilities than those who did not. This indicates that the Six Thinking Hats can be employed as an educational tool to promote the thinking process, decision making, high-order thinking abilities, and support both teachers and students (De Bono, 1997). This thinking system does provide students with chances to experience new learning ways, self-questioning, cooperative learning, and higher-order thinking skills. Its designed pattern regarding emotional states and frames of mind can trigger students' communication skills, reasoning, and critical thinking skills which are ideally developed (Kruse, 2010. When using problem-based learning, the student-centred concept is applied because there is time students are assigned to analyze the case with no significant support from the instructor. By definition, student learning takes place in such a designed setting where the instructor naturally becomes a facilitator, and the Six Thinking Hats are used as a practical guide to drive students' innovative thinking.

The colours of thinking hats have a significant role to play in provoking students' critical thinking skills. Some students found the White Hat less interesting and exciting because it seemed all about known data. Once they paid less attention and wrote the information in brief, some missing information was found in their reports. In the aspects of the Green and Blue Hats, they were the most challenging ones for most students to think creatively and to analyze the whole picture. Nevertheless, students' thinking skills were obviously developed to some extent. They enjoyed the thinking activity like in a playing field - thinking field. The Yellow and the Black Hats simply directed students to view from both negative and positive perspectives, which helped them to think about the situation differently. In the beginning, students were reluctant to truly express what they felt while wearing the Red Hat. After having been encouraged to express more feelings, they learned that freedom to feel and speak out was valued and respected.

In addition, the higher critical thinking may come from the learning atmosphere on the LINE chat app which provides more casual and relaxing options than a traditional classroom setting. Line is generally functioned as a discussion platform; thus, it was applied as a learning tool in this course for teacher's inquiries and students' responses. It can be practically used as a platform for learners' discussion and cooperation (Palloff & Pratt, 2007; Gabarre & Gabarre, 2013). LINE is a kind of social media that students use in daily life, so

they do not have any difficulties. This friendly-user and familiar learning tool helped to increase their involvement in the activity. Constructing knowledge among peers became easier. As Black (2005) puts up, online discussions possibly provoke student review and questioning and stimulate a collaborative learning atmosphere together with cogitation and critical thinking. The result of this study was in accordance with previous studies conducted in online forums offered the potential for critical thinking (Al-Fadhli & Khalfan, 2009; Ekahitanond, 2013; Marra, Moore, & Klimczak, 2004).

The next discussion is on students' motivation to learn. As the finding reveals a significantly higher motivation in the experimental group, there is more support that the Six Thinking Hats can be used in an online learning environment or social media. It can influence students' motivation, especially in English as a foreign language class where most students seem not interested in nor active. Good rapport between teachers and students and students and peers creates a more pleasant learning atmosphere. Such a relaxing and interactive classroom plays a significant part to promote students' positive attitude and encourage their active participation. The finding suggests that students preferred the new learning method that suits their lifestyle. This is probably because they are familiar with LINE and normally use it in daily life. Students had more motivation when compared to the traditional method. The finding is found to be similar to previous studies (Chaiprasurt & Esichaikul, 2014; Mockus et al., 2011; Olasina, 2012). The responses from an open-ended question can be used to support the finding that students feel motivated to learn. They had a positive attitude towards such learning in the course.

Conclusion

The Six Hats method allowed parallel thinking. Students wore each hat as they explored every angle of a critical issue. A cooperative exploration replaced confrontation. The Six Hats method allowed them to ponder a specific point at a time instead of putting effort into all things at once. When each aspect was focused, students' full attention to that particular point was magnified. It was like looking at a rainbow where each basic colour was separated to appreciate. The Six Thinking Hats system was like a thinking game for students, which made their learning fun and challenge.

To introduce students the Six Thinking Hats system for the first time, it consumed time to discuss a topic with the use of the Six Thinking Hats. It also required the teacher's repeated explanations and examples. When students felt familiar with the model, they became more independent thinkers. To select meaningful, entertaining, and appropriate movie clips is a challenge for teachers as well. It would be nicer if teachers work as a team to design such courses where creative teaching can be applied. It will be more effective to train students' critical minds through continuing courses in which critical thinking techniques are instilled.

In order not to spend too much time on the activity, the use of technology can be a good solution. Technology enables learning to occur anytime and anywhere. Like in this study, LINE was selected as a channel for the students to learn together. In future research, teachers may use other social media that students are familiar with and support learning well. In this regard, the features of each technology should be considered to see what works best with the course activity before making a choice.

References

Al-Fadhli, S., & Khalfan, A. (2009). Developing critical thinking in e-learning environment: Kuwait University as a case study. *Assessment & Evaluation in Higher Education, 34(5)*, 529-536.

Anderson, W., & Krathwohl, D. R. (Eds.). (2001). A taxonomy for learning, teaching, and assessing: A revision of Bloom'seducational objectives. NY: Longman.

Antino, A. (2008). Promoting academic motivation and self-regulation: Practical guidelines for online instructors. *TechTrends, 52*(3), 37-45.

Black, A. (2005). The use of asynchronous discussion: Creating a text of talk. *Contemporary Issues in Technology and Teacher Education, 5*(1), 5-24.

Chaiprasurt, C., &Esichaikul, V. (2014). Enhancing motivation in online courses with mobile communication tool support: A comparative study. *The International Review of Research in Open and Distance Learning, 14*(3), 377-400.

De Bono, E. (1997). AltıDüsünmeSapkaTeknigi (Six thinking hats technique). Retrieved from http://www.epo.hacettepe.edu.tr

Dörnyei, Z. (2001). Motivational strategies in the language classroom. Cambridge: Cambridge University Press.

Ekahitanond, V. (2013).Promoting undergraduate students' critical thinking skills through peer feedback activity in an online discussion forum. *Alberta Journal of Educational Research, 59*(2), 247-265.

Gabarre, S., & Gabarre, C. (2013). Using mobile Facebook as an LMS: Exploring impeding factors. *Gema Online Journal of Language Studies*, *13*(3), 99-115.

Goebel, G., & Seabert, D. (2006). Put on your thinking hats. Journal of School Health, *76*(4):393-395.

Gonzalez, D. (2003). Teaching and learning through chat: A taxonomy of educational chat for EFL/ESL. *Teaching English with technology*, *3*(4), 57-69.

Greenhow, C., & Robelia, B. (2009). Informal learning and identity formation in online social networks. *Learning, Media and Technology*, *34*, 119–140.

Horng, J., Hong, J., Chanlin, L., Chang, S., & Chu, H. (2007). Creative teachers and creative teaching strategies. *International Journal of Consumer Studies, 29*(4), 352-358.

Horwitz, J. (2013). Mobile chat app Line wants to take over the world, but faces a long road ahead. Retrieved from http://www.techinasia.com/mobile-chat-app-line-world-long-road/

House, S., Martínez, R. D., Alonso, M. R. A., Lin, M., Hobbs, V. H., García, L. C., & Banks, M. B. (2011). *Inglés.Investigación, innovación y buenasprácticas: Teacher Development*, *93*.

Hsieh, S. W. (2011). Effects of cognitive styles on an MSN virtual learning companion system as an adjunct to classroom instructions. *Educational Technology & Society, 14*(2), 161-174.

Hsu, J. (2007). Innovative technologies for education and learning: Education and knowledge-oriented applications of blogs, wikis, podcasts, and more. *International Journal of Information and Communication Technology Education, 3*(3), 70-89.

Kruse, D. (2010). Thinking Tools for the Inquiry Classroom. *Australia: Curriculum Corporation.*

Marra, R. M., Moore, J. L., & Klimczak, A. K. (2004). Content analysis of online discussion forums: A comparative analysis of Protocols. *Educational Technology Research & Development, 52*(2), 23-40.

Mazur, J. M. (2004). "Conversation analysis for educational technologists: Theoretical and methodological issues for researching the structures, processes and meaning of on-line talk." *Handbook of research on educational communications and technology. 2nd ed.* pp.1073-1098. Mahwah, NJ: Lawrence Erlbaum.

Mitez S. (2012). Six Thinking Hats. *Asian Journal of Management Research, 2*(2): 814-820.

Mockus, L., Dawson, H., Edel-Malizia, S., Shaffer, D., An, J., &Swaggerty, A. (2011, November). *The impact of mobile access on motivation: Distance education student perceptions*. Paper presented at the 17th Annual Sloan-C Consortium International Conference on Online Learning, Lake Buena Vista, FL. Retrieved from http://wc.psu.edu/sloan/

Olasina, G. (2012). Student's e-learning/m-learning experiences and impact on motivation in Nigeria. Retrieved from http://docs.lib.purdue.edu/iatul/2012/papers/31/

Palloff, R. M., & Pratt, K. (2007). *Building online learning communities*. San Francisco: Jossey-Bass.

Phothongsunan, S. (2014). Investigating Thai University Students' Attributions of English Learning Success: An International University Context. The 2014 WEI International Academic Conference Proceedings Vienna, Austria. The West East Institute,79-91.

Reeve, J. (2005). Understanding motivation and emotion (2nd ed.). Orlando: Harcourt College Publishers.

Seo, K. K. (2007). Utilizing peer moderating in online discussions: Addressing the controversy between teacher moderation and nonmoderation. *The American Journal of Distance Education, 21*(1), 21-36.

Stapa, S. H., & Shaari, A.H. (2012). Understanding online communicative language features in social networking environment. *Gema Online Journal of Language Studies. 12*(3), 817-830.

Treffinger, D. J., Isaksen, S. G., & Stead-Dorval, K. B. (2006). *Creative problem solving: An introduction* (4th ed.). Waco, TX: Prufrock Press.

Wang, Q. (2009). Design and evaluation of a collaborative learning environment. *Computers & Education, 53*, 1138–1146.

Wee, W. (2013). *The growth story and future of mobile chat app giant LINE.* Retrieved from http://www.techinasia.com/growth-story-future-mobile-chat-giant- line/

Yang, C., Tsai, I., Kim, B., Cho, M., &Laffey, J. (2006).Exploring the relationships between students' academic motivation and social ability in online learning environments. *The Internet and Higher Education, 9*(4), 277–286.