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การพัฒนารูปแบบการเรียนการสอนด้วยการประยุกต์ใช้แนวคิดปรัชญาเศรษฐกิจพอเพียงที่เน้นกระบวนการคิดและการปฏิบัติวิทิสาสมาธิ เพื่อส่งเสริมความสามารถในการเรียนรู้การวิจัยเพื่อพัฒนาการเรียนรู้วิชาภาษาอังกฤษ สำหรับนักศึกษาครู

Instructional Model Development through the Application of Sufficient Economy Philosophy Emphasizing Thinking Process and Vidisa Samadhi to Enhance the Ability of Research for Learning Development in English for Teacher Students

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ABSTRACT

The purposes of this research were:1) to develop an instructional model through the application of sufficient economy philosophy emphasizing thinking process and Vidisa Samathi (Meditation) to enhance the research ability in English learning development for student teachers; and 2) to investigate the research ability of student teachers for learning development in English via the instructional developed model. The study was conducted in 3 phases: 1) Analyzing context and constructing a conceptual framework; 2) Synthesizing the instructional model; and 3) Investigating the research ability in English learning development of the students through the implementation of the instructional model. A target group of 17 student teachers majoring in English at the Nakhon Ratchasima Rajabhat University was investigated in the academic year 2018. The research

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instruments employed in the study were semi-structured interviews, observation forms, and evaluation forms. Data were analyzed by using typology technique, percentage, and means. The study developed an instructional model with seven components, and five instructional steps: Preparing; Thinking process for planning; Thinking for acting; Thinking for reflecting; and Thinking for examining. The results after using the model revealed that the student teachers' competency meets the designated criteria. The effective model was named, SEP-V model.

Keywords: Sufficient Economy Philosophy, Vidisa Samathi, Instructional Model Development

บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อ 1) พัฒนารูปแบบการเรียนการสอนด้วยการประยุกต์ใช้แนวคิดปรัชญาเศรษฐกิจพอเพียงที่เน้นกระบวนการคิดและการปฏิบัติวิทิสาสมาธิ เพื่อส่งเสริมความสามารถในการเรียนรู้การวิจัยเพื่อพัฒนาการเรียนรู้วิชาภาษาอังกฤษสำหรับนักศึกษาครู และ 2) เพื่อศึกษาความสามารถในการเรียนรู้การวิจัยเพื่อพัฒนาการเรียนรู้วิชาภาษาอังกฤษด้วยรูปแบบการเรียนการสอนที่ได้พัฒนาขึ้น ดำเนินการศึกษาในปีการศึกษา 2561ด้วยการวิจัยสามระยะ คือ 1) ระยะศึกษาบริบทและสร้างกรอบแนวคิด 2) ระยะสังเคราะห์รูปแบบการเรียนการสอน และ 3) ระยะศึกษาความสามารถในการเรียนรู้การวิจัยเพื่อพัฒนาการเรียนรู้วิชาภาษาอังกฤษของนักศึกษาครูด้วยการใช้รูปแบบการเรียนการสอนที่ได้พัฒนาขึ้น กลุ่มเป้าหมายได้แก่นักศึกษาครุศาสตร์ สาขาวิชาภาษาอังกฤษมหาวิทยาลัยราชภัฏนครราชสีมา จำนวน 17 คน เครื่องมือวิจัยประกอบด้วย แบบสัมภาษณ์ แบบบันทึก แบบสังเกต และแบบประเมินความสามารถในการทำวิจัยเพื่อพัฒนาการเรียนรู้วิชาภาษาอังกฤษ วิเคราะห์ข้อมูลด้วยเทคนิคการจัดหมวดหมู่ข้อมูล ค่าร้อยละ และค่าเฉลี่ย ผลการวิจัยพบว่า 1) รูปแบบการเรียนการสอนที่ได้พัฒนาขึ้นประกอบด้วย 7 องค์ประกอบ และขั้นตอนการสอน 5 ขั้นตอนคือ ขั้นเตรียมความพร้อม ขั้นกระบวนการคิดวางแผน ขั้นคิดเชิงปฏิบัติ ขั้นสะท้อนผลการคิด และขั้นคิดตรวจสอบ และ 2) หลังการเรียนด้วยรูปแบบการเรียนการสอนที่ได้พัฒนาขึ้น นักศึกษาครูมีความสามารถในการเรียนรู้การวิจัยเพื่อพัฒนาการเรียนรู้วิชาภาษาอังกฤษตามเกณฑ์ที่กำหนด ผู้วิจัยตั้งชื่อรูปแบบการสอนนี้ว่า SEP-V model.

คำสำคัญ: ปรัชญาของเศรษฐกิจพอเพียง วิทิสาสมาธิ การพัฒนารูปแบบการเรียนการสอน

Introduction

Research for learning development is small-scale research conducted by a teacher within a classroom, using uncomplicated methodology and statistics. The research process affects both the teacher's professional development and the students' learning development. The teacher obtains new knowledge to prove his or her own teaching process in the class whereas the student gains more effective learning and performance. Therefore, the objective of learning development research is to decrease learning problems in class, and also improve the learning of students (Ritcharoon, 2014; Wongvanich, 2017). Hence, research for learning development is a vital course for student teachers as it is a component of the curriculum of Bachelor of Education (B.Ed.).

Learning research development in English consists of two essential thinking processes. Firstly, the investigating process and problem-solving skill that helps students achieve their learning goals. The other is a reasonable thinking process that helps students proceed with research successfully, such as decision making via prudent consideration. Both thinking processes should be provided and integrated into the instructional model (Kaemmanee, Chaowa-

keeratiphong & Wittayasirinun, 2015; Pornkul, 2014).

The instructional model is an explanation of specific attributes, activities, teaching media, teacher's role, and students' roles, learning supports, teaching steps, and teaching techniques to improve students' learning via theory. The instructional model also refers to the principle a teacher uses to assist a student to learn and achieve his or her learning goal effectively (Joyce, Weil, & Calhoun, 2000; Kaemmanee, 2012). Therefore, the instructional model to enhance research for learning ability in English should be supported by a thinking process that helps students to learn and perform effectively. This includes a total focus on reasons to plan, prudence to act, and mindfulness to proceed with research activities. One factor that causes successful learning is mindfulness. As explained by Juyarasok (2013), mindfulness makes the students what they are learning at a point in time, and how well it proceeds. In other words, mindfulness brings about intelligence as it helps students think about what is being learned, and how the cognitive process is being developed.

However, through the researchers' eight years of experience in teaching research for learning development in English, she has found that almost all of the student teachers produced unsatisfactory research work. In 2016-2017, about 80 percent of the students made serious errors in research work, such as incorrect research questions, research titles, research objectives, and variables. These problems need to be solved by an instructional model that provides thinking activities and mindfulness to help the students learn and do research works effectively.

Sufficient Economy Philosophy (SEP) contains the thinking process to develop the research skill for learning development in English of student teachers as it is applied to be used in the Thai educational system as explained by Dharmapiya & Saratun (2016). SEP presents a prototype of sufficiency thinking for Thai people to act responsibly, moderately, reasonably, and prudently. Similarly, sufficiency thinking is taught as a thinking process. In Thailand, the philosophy has been studied and most of the studies have revealed its positive effects on learning (Chinnawoot, Suttineam, Jarnarerux, Kedkaewkamol & Wuthiphong, 2010; Chutiwisoot, 2010; Nillapun, Vanichwatanavorachai & Yawongsa, 2011; Yamchut & Wongsritrakul, 2014).

Mindfulness and Samathi (Meditation) are related and can be typically promoted in daily life. It is a deliberate calm action that a person takes to focus on something at the present moment, and it usually comes with mindfulness, and can be sensed whenever a person disciplines himself or herself to continuously practice in an appropriate time and place.

However, since busy people do not have time for meditation, Vidisa Samadhi is introduced. Vidisa Samadhi is one of several meditation courses introduced in 2015 by Phra Dhammongkolyarn (Viriyang Sirintharo). Vidisa Samadhi emphasizes self-practice for 15 minutes a day. Besides, there are evidence by the brain and learning research that meditating continuously for at least 1-2 months helps decrease stress, and helps better retention in long-term memory leading to better learning (Holzel, Carmody, Vangel, Congleton, Yerramsetti & Gard, 2010; Singh, Sharma, & Talwar, 2012).

To improve student teachers' ability in research for learning development in English, an instructional model through the application of SEP emphasizing the thinking process and Vidisa Samathi was developed. This model enhances student teachers' research for learning development ability in English.

Objectives of the study

The objectives of the study were: 1) to develop an instructional model to enhance the research for learning development in English for student teachers via the application of the SEP emphasizing thinking process and Vidisa Samathi, and 2) to investigate the ability of student teachers in research for learning development via the instructional developed model.

Conceptual framework

The SEP key factors for learning is practical via three rings and two conditions. Three rings consist of moderation, reasonableness, and self-immunity, and two conditions consist of actual knowledge and morals. The use of the key factors are: 1) Moderation for learning and working: the ability to use the process for solving difficulties and making a decision about research planning and acting appropriately; 2) Being reasonable in learning and work: the ability to classify and understand problems and how to solve the problems with prudence and mindfulness; 3) Self-immunity for learning and working: the ability to share, to help, and to follow until the effective work is completed i.e. revising, evaluating, and confronting difficulties and changes are analyzed and well-manage; 4) Knowledge for learning and working: the ability to plan or to do something using an accurate body of knowledge prudently; and 5) Moral for learning and working, it is the performance to be intellectual, honest, patient, hard-working, responsible, helpful, and sharing while working together.

The thinking process is the use of brain activities via intellectual skill. The thinking process is seen as a problem- solving process via a connection between knowledge application and learning context to achieve the learning goal (Jutarasok, 2013; Kaemmamanee et al., 2015). The problem-solving process of a person is controlled by a self-regulated process or metacognition consisting of planning, examining, and evaluating, (Woolfolk, 2010). While the work is being proceeded, a person controls his or her working process by asking and examining himself or herself how work is effectively done, and how it is revised to produce effective work. Similarly, Jutarasok (2013) explained that the controlling process, such as asking to redo or revision for a better result, that influence better learning is called mindfulness; it helps the students produce effective work. According to research for learning development process, SEP emphasizing thinking process provides the key factors to support the students' learning continuously from the first to the end, to plan reasonably and moderately, to do prudently and mindfully of what has been planned, to check prudently, and to report honestly.

Vidisa Samathi is a meditation course specifically designed for busy people, and it was created by Phra Dhammongkolyarn (Viriyang Sirintharo) (2015). The objective of Vidisa Samathi is to increase mindfulness via easy Samathi in daily life. A meditator may sit on the floor, cross-legged with the right leg on top of the left one, putting the left hand on the lap with the right hand on it, and the body must be erect. Also, a meditator may sit on the chair, and keep the body straight. Then, mentally repeat "Bud dho" while breathing at a constant pace for 15 minutes a day. The first five minutes are done in the morning, the second five minutes in the afternoon, and the third five minutes in the evening. Doing this continuously for 7.5 hours a month or of at least 6 hours a month is believed to help the meditator control the mind, decrease stress, promotes mindfulness, and feel better in learning from time to time.

Sertis (2018) reported the research results about brain and meditation from the Harvard University research team that 5 hours a month for meditation practice is appropriate to produce effective work. Similarly, Malabuppha (2018) reported: The practical meditation in Google organization that allows its officers to do is about 1-2 minutes a day in the morning, so there will be about 1 hour a month for meditating in the organization. Therefore, the average hours for meditation practice in daily- life should be 4 hours a month or 70 percent of 6 hours a month proposed by Phra Dhammongkolyarn (Viriyang Sirintharo).

The both emphases, thinking process and Vidisa Samadhi, within the instructional model was expected to affect student teachers' ability as shown in figure 1.

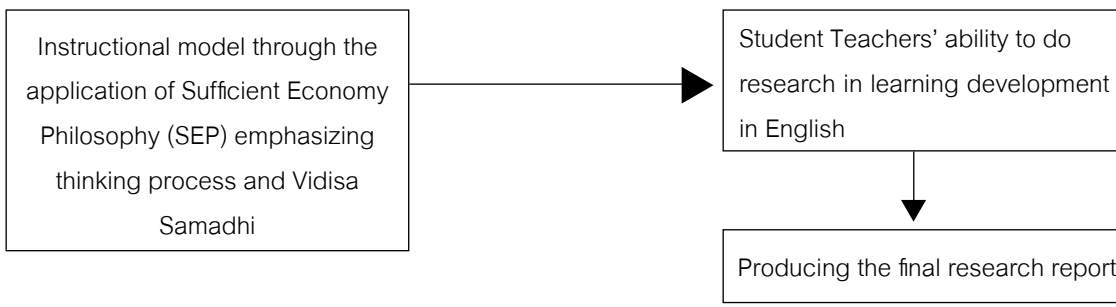

Figure 1 A conceptual frame work of the study

Methods

Both phases 1 and 2 adopted the qualitative data collection method consists of interviews, and document analysis. The study of phase 1 and 2 was conducted in the academic year 2018 with 3 steps. First, analyzing context. Two lecturers and fifteen student teachers of Nakhon Ratchasima Rajabhat University were interviewed, using a semi-structured interview, to discover the problems and need assessment in learning research for learning development in English. Next, related literature was reviewed, analyzed, summarized, and then all data were categorized using a typology technique to construct the conceptual framework (figure 1). The final step, synthesizing the instructional model based on the conceptual framework. The synthesized instructional model was quality-checked for its constructed-validity by five experts using an effective five rating-scale checklists, and use mean scores for data analysis.

In phase 3 of the study, the instructional model was implemented. The target group of 17 student teachers majoring in English at the Nakhon Ratchasima Rajabhat University was investigated via the instructional model in the academic year 2018. The procedure was divided into 2 steps. First of all, the group had started Vidisa Samathi orientation for one-month preparation before the study started, and the group had continued meditating since then. Thus, the form of cumulative hours of meditating Vidisa

Samathi had been recorded before and during the implementation to affect the students' mind at the right time. In the second step, the group learned and practiced via the instructional model for 54 hours (3 months) with continuously meditating 15 minutes a day in 4 months. The group was observed, and the assignment was assessed during the implementation. In the end, the final research product was assessed. The instruments used in phase 3 were effective lesson plans, observation form, Vidisa Samathi record format, evaluation form, and scoring rubrics. The instruments were quality-checked for their constructed-validity by three experts using five rating-scale checklists. Mean scores and percentages were used for data analysis in the instructional model implementation.

Results

1. The instructional model via the application of sufficient economy philosophy consists of seven components: principle, learning goal, teaching components, teachers' and students' roles, learning supports, instructional application, and nurturing effects. There are five steps of teaching included in the model; 1) Preparations: Providing learning supports for students via social media, and providing Vidisa Samathi orientation through successive practice since then; 2) Thinking process for planning: Informing students about learning objective, assigning research works as students' learning outcomes i.e. research instruments and lets students analyzing and identifying factors for successful planning for the assignments, or learning outcomes, reasonably and moderately; 3) Thinking for acting: Analyzing the factors for outlining the learning outcomes, doing the learning outcomes prudently and mindfully of what have been planned, and revising their learning outcomes via the lecturer's assistance; 4) Thinking for reflecting: Presenting their learning outcomes mindfully, editing responsibly and patiently via comments on the learning outcomes both in and out of class; and 5) thinking for examining: Making the final draft of learning outcome, checking prudently, comparing the learning outcome to the criteria honestly, and writing learning log individually with honesty. The constructed-validity of the instructional model's average mean scores was 4.97 which was the highest quality level.

2. After the instructional model implementation, the ability to research for learning development in English was enhanced. The students were able to produce their learning outputs and research reports

Table 1: Percentage of the student teachers who achieved the designated criterion for the complete research report

Scores of the complete research report		Numbers of student achieved		Percentage of students achieved	
Total scores	70 percent	Numbers	Percentage	Minimum	Maximum
100	70	17	100	82	94

with a quality that met the designated criterion at 70 percent of the total score as shown in Table1.

Table 1 shows the percentage of the teacher students who achieved the designated criterion at 70 percent of the total scores for their quality of the complete research report. The percentage obtained by the students was 82 in minimum, and 94 in maximum, with 100 percent of the students achieved the criterion.

3. The student teachers were able to produce their learning outputs and research reports with a quality that significantly met the designated criterion of 70 percent of the total score as shown in Table 2.

Table 2: A significant level test of increasing 70 percent of the students' scores of learning ability using one sample dependent t-test

N	μ	$\bar{X}$	S.D.	t	Sig
17	70	86.76	4.52	15.289*	0.00

* $p < .05$

Table 2 shows 95 percent confidence of the difference at 0.05 level of significance through t-test dependent sample which reveals the p-value at 0.00. The average score ($\bar{x}$) was 86.67 which is a higher value than the average score of 70 (μ).

Discussion

The study showed that the instructional model was effective as it enhanced the student teachers' ability in research for learning development in English. Below are the discussions on the results.

The average mean scores showed that the instructional model was ideal for implementation. The model was constructed via a systematic process consisting of five stages: analyze, design, develop, implement, and evaluate. It focused on evaluation leading to changes in the instructional model. The changes were made based on the feedback from the five experts. The results from the systematic procedure and the five experts' suggestions were helpful in revising the instructional model. In the period of implementation via the action research, the group was interviewed, observed, and wrote the learning log. Then the researcher and the research assistance analyzed data to alter the activities in the lesson plan. This process might cause the instructional model valid with seven components within five steps of instruction included in the model, as Clark (2000) and McGriff (2000) explained that the evaluation is the center of an incorrect model as it can be altered at any stage depending on the obtained data during the model construction and implementation.

The results were similar to the findings on Sufficient Economy Philosophy of Thai student teachers in 2010-2014 (Chinnawoot et al., 2010; Kaewurai& others, 2011; Nilapun et al., 2011; Yamchut & Wongsritrakul, 2014). The effectiveness can be explained that the instructional model construction focused on the key factors of Sufficient Economy Philosophy emphasizing the thinking process via the five-staged activities causing effective instructional model. The process supports thinking to work under

three factors as proposed by Thai educators: moderate planning, prudent acting, and self-recognition of morals while working together (Chaipattana Foundation, 2017; Kaemmanee, 2015; Juyarasok, 2013; Pornkul, 2014; Techakoop, 2015).

Meditating Vidisa Samathi in daily-life may improve learning ability. The students' record of cumulative meditating hours revealed that 100 percent of the student teachers met the criterion of 70 percent of the practice. As explained by Phra Dhammongkolyarn (Viriyang Sirintharo) (2015), when the meditators accumulated the meditating hours at the appropriate level, meditation is able to promote their learning, help decrease stress, and make work easier. This is in line with the scientific finding of the brain and learning that short-term or long-term meditation promotes self-awareness, cognitive function, decrease stress in the brain, and helps better retention leading to better learning ability (Holzel et al., 2010; Singh et al., 2012; Thanupaprangsan & Lertsakornsiri, 2016).

The thinking process via Vidisa Samathi plays an important role in the students' ability to do research in learning development in English as shown in Table 1. The effectiveness may be as a result of the five-step instruction focusing on the thinking process providing the students 15 minutes meditation a day which is enough to affect mindfulness causing prudence while working on academic work, as Phra Dhammongkolyarn (ViriyangSirintharo) (2015), and the foreign research team (Holzel et al., 2010; Singh, Sharma, & Talwar. 2012) had explained that mediation effects mindfulness, affect memory, and cognitive process in the brain. Also, the SEP key factors provided to support the students' learning continuously from the first step to the end; to plan reasonably and moderately, to do prudently and mindfully of what has been planned, to check prudently, and to report honestly might enhance their ability in learning as tertiary researchers in Thailand found that the SEP key factors play an important role to enhance learning development ability of the students. (Anunuthavorasakul, 2009; Chinnawoot et al., 2010; Nillapun et al., 2011)

Conclusion

The instructional model developed through the application of SEP emphasized thinking process and Vidisa Samathi had seven components with five instructional steps. The seven components were principle, learning goal, teaching components, teachers' and students' roles, learning supports, instructional application, and nurturing effects. The five steps of instruction were preparations, thinking process for planning, thinking for acting, thinking for reflection, and thinking for examining. The model was effective as it revealed the designated criteria of 70 percent, and the confidence of 70 percent at 0.05 level of significance. The effective instructional model was appropriate to be used for enhancing learning development ability in English for Thai student teachers. The model was named SEP-V model.

References

Chaipattana Foundation. (2017). *Sufficiency economy philosophy.* Retrieved January 1, 2017, from http://www.chaipat.or.th/site_content/item/1309-2010-06-03-09-50-07.html

Chinnawoot, S., Suttineam, U., Jarnarerux, J., Ked kaewkamol, M., & Wuthiphong, J. (2010). *The effect of knowledge management to nursing practice based on sufficiency economy philosophy in principles and nursing techniques practicum.* Retrieved March 15, 2012, from https://www.nur.psu.ac.th/journal/file/65file1621.pdf

Chutiwisoot, P. (2010). *Application of the sufficiency economy philosophy to instruct at the undergraduate level*. Retrieved August 17, 2016, from http://romphruekj.krirk.ac.th/books/2553/2/6.pdf

Clark, D. (2000). *Introduction to instructional system design.* Retrieved June 20, 2004, from http://www.nwlink.com/~donclark/hrd/sat.html

Clark, R. C. (2002). *The new ISD: Applying cognitive strategies to instructional design.* Retrieved June 10, 2004, from http://ocw.metu.edu.tr/file.php/ 118/Week7/clark-2002.pdf

Dharmapiya, P. & Saratun, M. (2016). Cultivating a sufficiency mindset in Thai schools. *In Sufficiency thinking* (p. 127). Crows Nest, NSW: Allen & Unwin.

Holzel, B. K., Carmody, J., Vangel, M., Congleton, C., Yerramsetti, S.M., Gard, T.. (2010). *Mindfulness practice leads to increases in regional brain gray matter density.* Retrieved May 22, 2017, from https://www.ncbi.nlm.nih.gov/ pmc/articles/PMC3004979/

Joyce, B., Weil, M. & Calhoun, E. (2000). *Models of teaching* (8th ed.). London: Pearson.

Juyarasok, M. (2013). *Systematic thinking: Teaching application.* Bangkok: Thana press.

Kaemmanee, T. (2012). *Instruction Pedagogy* (16th ed.). Bangkok: Chulalongkorn University Press.

_____. (2015). *Decoding sufficient economy philosophy to teaching thinking process.* Bangkok: Chulalongkorn University Press.

Kaemmanee, T., Chaowakeeratiphong, N. & Wittayasirinan, S. (2015). *Thinkingdimension: Framework about thinking.* Bangkok: Dhurakit Pundit University press.

McGriff, S. J. (2000). *Instructional System Design (ISD): Using the ADDIE Model.* Retrieved June 19, 2017, from https://www.lib.purdue.edu/ sites/default/

Nillapun, M., Vanichwatanavorachai, S. & Yawongsa, P. (2011 July-December). The development of sufficient economy instructional model of the professional teacher course: A case study of Faculty of Education, Silpakorn University. *Silpakorn Educational Research Journal. 3(1,2),* pp. 14-23.

Phra Dhammongkolyarn (Viriyang Sirintharo). (2015). *Meditation teacher course book 3.* Bangkok: Prachachon.

Pornkul, C. (2014). *Teaching thinking process and application.* (3rd ed.). Bangkok: Chulalongkorn University Press.

Ritcharoon, P. (2014). *Research for learning development: Classroom action research.* Bangkok: Pranakhon Rajabhat University.

Sertis. (2018). *Mediation and scientific research.* Retrieved June 10, 2018, from https://sertiscorp.com

Singh, Y., Sharma, R. &Talwar, A. (2012). November-December). Immediate and long-term effects of meditation on acute stress reactivity, cognitive functions, and intelligence. *Alternative Therapies.18(6),* pp. 46-53. Retrieved June 19, 2017, from https://www.ncbi.nlm.nih.gov/pubmed/23251943

Techakoop, P. (2015). *Metacognition: Thinking pedagogy.* Bangkok: Dhurakit Pundit University.

Thanupaprangsan, S. & Lertsakornsiri, M. (2016). The effects of meditation practice approaches by integrating satipatthana 4 and SKT 1 on mental ability, self-awareness and academic achievement of nursing students. *Songklanagarind Journal of Nursing. 36(4),* pp. 13-28 Retrieved March 10, 2018, from https://www.tci-thaijo.org/index.php/nur-psu/article/view/73461

Wongvanich, S. (2017). *Classroom action research.* Bangkok: Chulalongkorn University Press.

Yamchut, N. & Wongsritrakul, P. (2014). *The application on the philosophy of sufficient economy in higher education management of Thonburi University.* Retrieved August 17, 2016, from www.thonburi-u.ac.th/journal/Document/8-17/17-2-Nopphawan-Phairat.pdf