



การศึกษาปัญหาในการจัดกิจกรรมค่ายอาสาของนิสิต นักศึกษาระดับอุดมศึกษา

A Study of Problems Related to Volunteer Camp Activity Arrangements for Students in Higher Education

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บทคัดย่อ

การวิจัยในครั้งนี้มีจุดประสงค์เพื่อศึกษาปัญหาและความต้องการในการจัดการค่ายของอาจารย์ นิสิต และนักศึกษา ระดับอุดมศึกษา ดำเนินการวิจัยแบบผสมวิธี รูปแบบ explanatory sequential design (quan->QUAL) ประกอบด้วย 2 ขั้นตอน คือ การศึกษาข้อมูลเชิงปริมาณ โดยใช้แบบสอบถาม จำนวน 480 ฉบับจากนิสิต นักศึกษา ผู้เคยจัดกิจกรรมค่ายอาสา และการศึกษาข้อมูลเชิงคุณภาพ โดยสัมภาษณ์นิสิต นักศึกษา ผู้ที่จัดกิจกรรมค่ายอาสา จำนวน 5 คน และสัมภาษณ์อาจารย์ที่ดูแลการจัดค่ายอาสา จำนวน 5 คน วิเคราะห์ข้อมูลเชิงปริมาณโดยการแจกแจงความถี่ หาค่าร้อยละ วิเคราะห์ข้อมูลเชิงคุณภาพด้วยการวิเคราะห์เนื้อหา ผลการวิจัย พบว่า 1) สภาพในค่ายอาสาที่ต้องปรับปรุงมากที่สุด 5 ด้าน ได้แก่ ที่พัก อาหาร การเดินทาง ความปลอดภัย และการจัดการปัญหา 2) ปัญหาในการจัดค่ายอาสา ได้แก่ งบประมาณ การแก้ปัญหา และการทำงานเป็นทีม 3) แนวทางแก้ปัญหาเพื่อเพิ่มประสิทธิภาพ ได้แก่ การสื่อสารและทำงานเป็นทีม การพัฒนาบุคลากรให้มีความสามารถแก้ปัญหาเชิงสร้างสรรค์

คำสำคัญ: สภาพและปัญหาค่ายอาสา, การจัดกิจกรรมค่ายอาสา, นักศึกษาระดับอุดมศึกษา

Article Info: Received 26 September, 2018; Received in revised form 28 February, 2019; Accepted 1 March, 2019

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Acknowledgements: This research was supported by a PhD Scholarship from The Office of the Higher Education Commission, Thailand, and a grant from the 90th Anniversary of the Chulalongkorn University Fund (Ratchadaphiseksomphot Endowment Fund).

Abstract

This research aimed to study the problems related to volunteer camp arrangements of lecturers, experts and students in higher education. The handling of camp problems were investigated using explanatory sequential design (quan->QUAL) and consisted of 2 steps: the first step used quantitative data obtained from 480 questionnaires, which were surveyed from students who arranged camps. The second step was conducted using qualitative data via interviewing of 5 students who arranged camps and 5 lecturers who were responsible for camp arrangements. The data was analyzed using descriptive analysis (frequency distribution, percentages), and demand and qualitative data analyses. The research results showed that: 1) there were 5 states of camp arrangements that must be improved, including accommodation, meals, travelling, security, and problem solving; 2) the problems related to camp arrangements were budget, problem solving, and team work; and 3) The efficiency of problem solving should be increased to enable better communication, team work and staff creative problem solving.

Keywords: state and problem of camp arrangements, volunteer camp activity, students in higher education

Introduction

The rapidly changing global society and economy in Thailand is leading to personnel development, enabling Thailand to achieve "Prosperity, Security and Sustainability". The Thai government's objective is to develop Thailand to 4.0, referring to an economic development model towards the "value-based economy" or an economy driven by innovation. The model economy development has 3 main parts; an economy development model, research & development, science and technology development, and human knowledge learning. The main purpose of Thailand 4.0 is to build and develop humans to train Thais who have the 4 Hs, namely: 1) The Head, meaning intelligent Thai people; 2) The Hand, meaning skillful Thai people; 3) Health, meaning healthy Thai people; and 4) The Heart, meaning Thai people with a good mental health (Maesinsee, 2016). Therefore, the government is coordinating with state and

private sectors to develop humans to reach Thailand 4.0, starting with child and youth age groups.

Education and teaching in schools has had many problems in Thailand. For example, young Thai students spend a lot of time in the classroom but the results are lower compared to Finnish students who spend less time in classroom. Moreover, some teachers work other jobs which are not related to out-of-class teaching, and some teachers have a lack of knowledge of learning techniques, or still use old dated teaching models (Thailand Development Research Institute, 2015). Presently, most parents realize the problems of EQ development. Excluding student literacy, it is believed that students are able to face and solve problems if they can cultivate skills to solve problems and life skills from childhood (Centre of Students' Life Skills Promotion, 2015). Most parents send their children to join activities at camps in order to learn how to solve problems and gain life skills either on weekends (including long weekends) or holidays. Parents would like their children to develop physical and mental skills, practicing real life situations in response to their own abilities, to help open opportunities in line with their interests (Ministry of Education, 2009). The camps respond to the need to learn and help to develop the attendees as human beings.

According to the camp hub website, camps in Thailand are highly popular, averaging 870 activities per year, and continuing to increase (Camphub, 2017). The camp hub separates activities into several categories as follows: 1) advisor camps; 2) tutor camps; 3) camps for youth development; 4) language camps; 5) conservation camps; 6) volunteer camps; 7) camps for university students; 8) open house camps; and 9) activity camps. The website's purpose is to provide information on activity centers. The camp organiser can send the information for camp applications to the camp hub immediately. However, Thailand has

never collected this data, and the camp organisers do not join together to regulate their operation standards, security and or combine to enable problem solving. A number of student accidents and deaths at camps have occurred, such as drowning, car accidents, and falls from high level buildings. This has occurred due to low standards of equipment and food poisoning, etc. Despite knowledge of these accidents, government agencies still do not control the standard of camping in Thailand.

Therefore, the researchers have developed a framework for organising camps, using thinking outside the box and PMI to support creative problem-solving abilities for students in higher education. It is expected that the findings will be highly beneficial to learners as they will be able to operate the camps systematically and solve tproblems creatively, which are essential components of camp arrangements.

Objectives

To study the problems and requirements related to the volunteer camp arrangements of lecturers, experts, and students in higher education.

Research framework

The researcher fixed the 4 frameworks as follows: 1) camp arrangements; 2) lateral thinking techniques; 3) PMI tool; and 4) consideration of a group support system.

1) Camp arrangement

The researcher analysed camp arrangements using a 4 step process; 1) planning of the camp project, 2) camp preparation, 3) camp operation, and 4) conclusion and camp evaluation (American Camp Association, 2016; Centre of Students' Life Skills Promotion, 2015; Chaiyanboon, 1992; Ministry of

Education, 2009; The Institute for the Promotion of Teaching Science and Technology [IPST], 2011).

2) Lateral thinking technique

The researcher analysed the lateral thinking technique via the following steps: 1) setting the issue/ problems; 2) separating the issue into 3 points, 2.1 the possible idea, 2.2 the impossible idea, and 2.3 PO; and 3) starting from PO and using brainstorming ideas that are not continuous, strange or different (Butler, 2010; De Bono, 1990, 2006, 2010).

3) PMI Tool

The researcher used the PMI tool for clear ideas and decisions by considering a system (not by emotion) using the following steps; 1) P (Plus) is a positive issue or advantage; 2) M (Minus) is a negative issue or disadvantage; and 3) I (Interesting) is an interesting issue. The steps take 2-3 minutes (De Bono, 2006; Meier, 2009).

4) Group Support System

The researcher synthesized the development of an efficient and effective group support system by using 1) brainstorming tools, 2) discussion forum tools, 3) rating tools, 4) ranking tools and, 5) selection tools (Desanctis & Gallup, 1993; Gray, 2003; Hillegersberg & Koenen, 2014; Huber, 1984; Pakdiwatanakul, 2003)

Methodology

1. Sample and data informants

The sample was calculated from the actual population using the formula of Cochran (1963). It was estimated that a total of 480 students who participated in volunteer camps would be required. A total of 54 students had previous experience of arranging volunteer camps (6 universities), 5 students

had camp interview experience, and 5 lecturers had been responsible for camp interview arrangements. Six universities were randomly selected using a quota sampling method from 3 types of universities: 1) national universities, 2) autonomous universities and 3) private universities.

The data concerning the needs and problems related to camp management was collected from 480 higher education students who participated in volunteer camps at 6 universities. There were 600 questionnaires sent with an average return of approximately 81 percent (Wiratchai, 1999) equating to 486 returned questionnaires.

The sample size of the 54 students who had previous experience of camp arrangements was calculated based upon the important characteristics of camp arrangements (Saenasu, 1989, as cited in SaeZhong, 2010). The questionnaires were composed of 3 parts as follows: the first part had 3 kinds of funding support: total support, part support and no support. In the second part, the camp duration included the options of 1 day, 3 days, or more than 3 days. In the third part, the area of the camps were separated into either inside or outside the university area. The number of questionnaires returned was 54 (100 percent).

There were 3 criteria to select the 5 students who managed the camp (Kamketu, 2008): 1) the camp operator, 2) more than 5 experiences of camp arrangement, and 3) good research cooperation.

There were 3 criteria to select the 5 lecturers/ administrators for camp management: 1) the relevant position in camp management, 2) at least 5 years of experience of camp management, and 3) the good cooperation of research.

2. Research tools

The research tools consisted of questionnaires and structured interviews. The researcher presented questionnaires and interview questions

with details on the research topic, research objectives and research framework to three qualified experts. Three experts were selected to examine the questionnaires and structured interviews for content validity and returned IOC values greater than 0.5. The reliability analysis of the questionnaire showed a value of 0.91. Data were analysed using descriptive statistics (frequency, percentage, mean, standard deviation (*SD*)) and content analysis.

Research results

From the questionnaires of 480 students (Figure 1), the results showed that 186 students were male (38.8%) and 294 (61.3%) students were female. A total of 184 students were aged between 18-20 years (38.3%), 275 students were aged between 21-23 years (57.2%), and 21 students were aged 24-26 years (4.4%; Figure 2). A total of 94 students were studying in the 1st year (19.6%), 157 students were studying in the 2nd year (32.7%), 137 students were studying in the 3rd year (28.5%), 85 students were studying in the 4th year (17.7%), and 7 students were studying in the 5th year (1.5%; Figure 3).

A total of 80 students were studying at Chulalongkorn University (16.7%), and Srinakarinwirote University (16.7%), Sirindhorn International Technology Institute (16.7%), Suandusit University, Trang campus (16.7%) and at Panyapiwat Institute (16.7%), respectively (Figure 4). A total of 231 students had organised camps for 1-2 years (48.1%), 160 students had never organised camps (33.3%), 83 students had organised camps for 3-4 years (17.3%), 3 students had organised camps for 5-6 years (0.6%) and 3 students had organised camps for more than 6 years (0.6%; Figure 5).

A total of 409 students had joined the camps 1-5 times (85.3%), 54 students had joined the camps 6-10 times (11.4%), 11 students had joined the camps 11-15 times (2.2%), 2 students had joined the camps 16-20 times (0.4%),

3 students had joined the camps 26-30 times (0.6%), and 1 student had joined the camps just once (Figure 6).

Figure 1

Sex of students

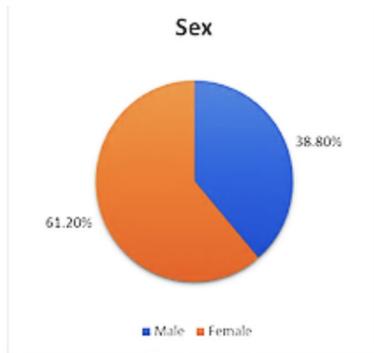


Figure 2

Age of students

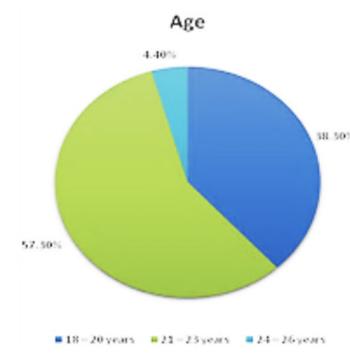


Figure 3

Year of studying



Figure 4

Students' education institute

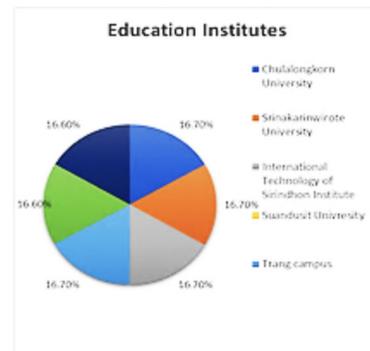


Figure 5
Experience of students' camp arrangement

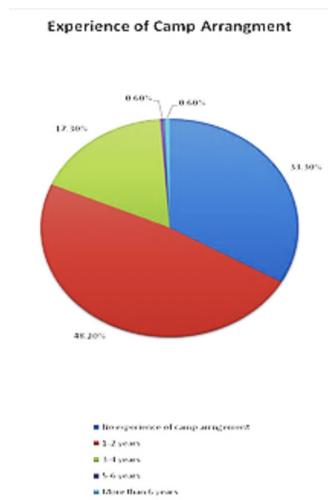


Figure 6
Number of students' camp participation

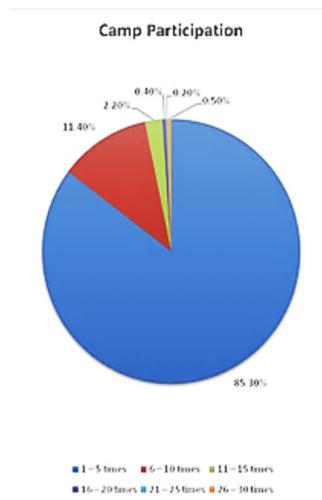


Table 1

The 5 ranks of problems during camp arrangement (1)/ need urgent solving (2) of the participants

Problems found during camp arrangements	1 st		2 nd		3 rd		4 th		5 th		rank	
	Percent		Percent		Percent		Percent		Percent			
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
a. Accommodation	19.6	15.6	11.7	10.4	11.0	9.6	11.3	13.5	9.6	9.4	1	1
b. Meals	8.5	8.5	17.1	16.5	10.8	11.9	10.2	11.0	9.2	9.4	2	2
c. Travelling	16.9	10.8	11.7	13.5	14.6	12.5	10.0	9.4	8.1	7.7	3	
d. Security	5.6	15.2	8.1	12.3	10.2	10.4	9.4	10.6	7.9	6.9	4	4
e. Nursing	3.8	4.8	5.8	7.3	5.6	8.1	8.1	7.1	8.8	8.1		
f. Problem solving	12.7	14.6	11.0	9.2	10.2	14.8	9.0	7.7	10.4	10.0	5	3
g. Visual	5.6	4.0	5.0	5.0	6.3	5.0	4.0	5.0	6.5	5.4		
h. Public relations	10.8	9.2	9.4	7.5	10.2	7.9	6.3	7.1	7.9	7.5		
i. Participants	9.0	7.9	8.3	7.3	8.5	7.5	9.8	8.1	8.3	8.8		
j. Camp documentary	2.1	2.3	4.8	3.5	4.2	5.0	6.0	7.5	5.0	6.5		

Table 1 (Cont.)

The 5 ranks of problems during camp arrangement (1)/ need urgent solving (2) of the participants

Problems found during camp arrangements	1 st		2 nd		3 rd		4 th		5 th		rank	
	Percent		Percent		Percent		Percent		Percent		(1)	(2)
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
k. Registration	2.3	2.3	2.7	2.5	2.1	2.3	4.4	5.2	5.6	4.8		
l. Speakers	1.0	1.0	2.1	2.5	3.5	1.9	6.0	4.0	4.4	6.0		
m. Evaluation & Improvement	2.1	3.8	2.9	2.5	2.7	3.1	5.6	3.8	9.3	9.6		5

Note. 5 ranks found during the camp activity arrangements/ must be solved urgently (2)

Table 1 shows the first 5 ranks of student problems from those who participated in the camps (1 = not found; 5 = most often found). The top ranked student problem was related to accommodation, second was meals, third was travelling, fourth was security, and fifth was related to problem solving.

The researcher interviewed 5 students who organised the camps and the data of the interviews were analysed and separated into 3 key issues: 1) communication, 2) responsibility, and 3) team work.

1. Communication - The problems of internal communication among the camp organiser team.

“Communication problems were particularly prevalent with the student attendants. The attendants did not prepare themselves in advance, meaning that they did not join the camp preparation day. This led to the students not possessing much knowledge of how to work. The problem of transportation consisted of the high cost of transportation due to no free train or supporting funds. According to senior staff opinions, current junior staff were not able to share their ideas.” (The 5th interviewee, personal communication).

“They must communicate more with each other in order to follow up the progress of job and the problem as they don’t know the process of the job.” (The 2nd interviewee, personal communication).

“They must be able to communicate well and do more to follow up unfinished jobs.” (The 1st interviewee, personal communication).

“They will meet a lot of people and face problems, so they must think to solve the problems by being calm and communicative.” (The 3rd interviewee, personal communication).

2. The responsibility: the problem of responsibility and following up unfinished job assignments.

“The problems related to the assigned job are difficult to follow up. It is difficult to contact and follow up the job even though I communicated on LINE.” (The 4th interviewee, personal communication).

“It is necessary for the person who did not attend the meeting to read the minutes and follow up the progress of the job. One more problem is with work load of the junior staff as they are not aware of their own power, for example, they spend more time on concrete buildings than wood buildings. The junior and senior staff can comment in the meeting (The 5th interviewee, personal communication).

3. Teamwork: the problem is that the team has a separate vision, but they must have a united vision.

“The team must arrange the meetings and assign jobs to the team in advance (not only to the team leader).” (The 4th interviewee, personal communication).

“The team must set the job priority and the steps, otherwise they will encounter problems. A relationship with villagers is necessary. They must think carefully, solve problems, be aware of the public effect, and also cooperate

to solve problems (The 3rd interviewee, personal communication).

“At first, the team must arrange meetings, then a meeting for each function, before starting the camp (The 4th interviewee), personal communication).

The researcher interviewed 5 lecturers/ administrators who took care of the camp arrangement. The researcher analysed the important issues of their interview data and answers, which were separated into 2 issues: 1) budget, and 2) problem solving.

1. Budget: lecturers/ administrators commented that the students could not control and manage the budget efficiently.

“The main problem is with sponsors and the limited time, such as repairing the camp takes only a little time, whereas building the camp takes months.” (The 1st interviewee, personal communication).

“The problem of less budget is different from the past. In the past, the budget was fully paid, whereas presently, one part of the budget is funded by the university and another part is funded by finding a sponsor. Furthermore, the decision making of each camp organiser acts in the same way as the former using the same places and situations. If they encounter a different place or situation, they cannot solve the problems. Therefore, they should have a more experienced person to find more information about the place, and junior staff to discuss with a more experienced person to get more ideas. The junior staff have never arranged camps, so they cannot make good decisions and follow the former senior staff (The 2nd interviewee, personal communication).

“They must be careful with money spending. The work delays use more money and difficult travel causes an inconvenience, especially for food buying; so being well planned is necessary (The 1st interviewee, personal communication).

2. Problem solving

Lecturers and administrators commented that students could not continuously solve problems due to less camp arrangement experience. Therefore, they could not immediately solve problems, leading to miscommunication.

“The problem is the management, such as details of jobs, camp arrangement and arrangement charts.” (The 5th interviewee, personal communication).

“The adjustment of students in various situations is not good.” (The 4th interviewee, personal communication).

“The lecturers and committee of the camp do the yearly work plan, arrange meetings and attend the meetings with lecturers/ administrators. When camping, the camp members work the lessons every night, plan for the next day, note and prepare solving new problems, and the executives are mindful to accept new ideas. (The 5th interviewee, personal communication).

“There is not the internal and external coordination. There is not enough time to prepare the camp and students lack experience of arranging and preparing the camp.” (The 4th interviewee, personal communication).

Discussion

The data analysis showed that the main problems were: 1) the budget, 2) problem solving, and 3) teamwork.

The main problem related camp management was the budget as the budget reflected the camp style and camp operation. Limited university budget funding did not cover all expenses, leading to the students attempting to find more funding via 2 methods; 1) finding a sponsor, and 2) donations.

The donations from sponsors included money, items such as sweets,

milk, utensils and/or building materials, with the majority donated from regular sponsors. While the students tried to find a sponsor, companies had often already closed their own budget. Alternatively, the time was too close to camp commencement, not enabling the university to issue a letter and allow the students to be granted the budget. Therefore, this suggests that it is necessary for the students to plan and coordinate funding well in advance to camp commencement. In addition, in some cases the materials provided by the sponsors were either expired or in too bad a condition to build. They were also transported too far from camp and a lot of money was wasted for their transportation (Kasetsakulchai, 2010), meaning that the cost margin was high and less money was left available. The students also needed to inspect the materials and have a well plan to effectively manage the budget (Doithai, 2017).

The camp organiser usually had a different solution to the problem and the new camp organisers faced immediate problems during camp arrangements, such as staffing problems, locations and the changing weather conditions. In particular, the timing and limited experience caused the students to be unable to immediately solve problems. Furthermore, problem solving was complicated because there were too many staff involved in arranging the camp, for instance, lecturers, administrators, students, landlords of the local area, and the community. Therefore, the students should attend the meetings to understand the problems (Treffinger et al., 2000), helping them plan carefully using brainstorming solution with experienced persons (Zhong, 2015), and help prepare for bad weather when a team cannot enter the area. They should consult with other people in the community area to get help to resolve problems.

Teamwork was identified as the main problem in arranging the camps as each student did not have the same available time due to studying, being busy, resigning etc. This led to the students not attending all the meetings at

the same time. Consequently, the team should include spare team members to cover work in case of staff being unable to work. It is evident that teamwork is very important (Hongladarom, 2015) for arranging camps and for assigning jobs to each student. Therefore, staff cover should be appropriately assigned to immediately cover work when problems arise.

Recommendations

The research results were applied as follows:

1. The budget management

The students and advisor must plan in advance to enable the systematic management of operations via technology applications. This will promote teamwork to help find funding from companies and receive donations to make decisions and solve problems in a time efficient manner.

2. Problem solving issues were related to a lack of knowledge of camp arrangements.

The students need to call meetings regularly by using communicative technology for immediate mutual decision making.

3. The students' teamwork is very important for camp arrangements. In order to arrange a successful camp, the students and advisors must set up a step by step work plan so that each person has responsibility. If the responsible person is unable to work, another person in reserve should be available to cover the work instead. A technology application can be used as a tool for reporting and following up job progress.

4. This research is suitable for those who have never previously organised a volunteer camp, or, do not regularly organise volunteer camps. This is because most knowledge related to university camp management is transferred in a non-structured format, such as verbally, from one generation to another.

This research can be used as a guideline for those who have never previously organised a volunteer camp, or, for those who do not regularly organise volunteer camps. The findings from this research study permit easy preparation of planning a camp using a structured format. This will help provide the appropriate knowledge to solve problems using a step-by-step process.

References

- American Camp Association. (2016). *ACA facts and trends*. <http://www.acacamps.org/press-room/aca-facts-trends>
- Butler, S. A. (2010). Solving business problems using a lateral thinking approach. *Management Decision*, 48(1), 58-64.
- Camphub. (2017). *Camp calendar*. <https://www.camphub.in.th/calendar/>
- Centre of Students' Life Skills Promotion. (2015). *The way of the arrangement of life skill camp promotion: Stop the problems by power of young children and youth*. Office of the Basic Education Commission.
- Chaiyanboon, S. (1992). *Technique of day camp and summer camp arrangement*. Faculty of Education, Chulalongkorn University.
- Cochran, W. G. (1963). *Sampling techniques* (2nd ed.). John Wiley and Sons. edis.ifas.ufl.edu/pd006
- De Bono, E. (1990). *Lateral thinking for management: A handbook*. Penguin.
- De Bono, E. (2006). *De Bono's thinking course*. Educational Publishers LLP.
- De Bono, E. (2010). *Lateral thinking: A textbook of creativity*. Penguin Books.
- DeSanctis, G., & Gallupe, B. (1993). Group decision support systems: A new frontier. *SIGMIS Database*, 16(2), 3-10.
- Doithai. (2017). *What is the financial statement and what is the composition*. <http://doithai.com/article/59/What-is-the-Financial-Statement-and-What-is-the-composition>

- Gray, P. (2003). Group decision support systems. *Decision Support Systems*, 3, 233-242.
- Hillegersberg, J. V., & Koenen, S. (2014). Adoption of web-based group decision support systems: Conditions for growth. *Procedia Technology*, 16, 675-683.
- Hongladarom, C. (2015, February 14). *Work effectively with the team Suansunandra Rajabhat University*. GotoKnow. <https://www.gotoknow.org/posts/586033>
- Huber, G. P. (1984). Issues in the design of group decision support systems. *MIS Quarterly*, 8(3), 195-204.
- Kamketu, W. (2008). *Research methodology in behavioral science* (2nd ed.). Chulalongkorn University.
- Kasetsakulchai, S. (2010). Material handling cost analysis. *Technology Promotion*, 37(4), 46-51.
- Maesinsee, S. (2016). *Thailand 4.0 in context of human resources development*. YouTube. <https://www.youtube.com/watch?v=jWWWf17/W52k>
- Meier, J. D. (2009, January 13). How to use the PMI technique to improve your thinking. Sources of Insight. <http://sourcesofinsight.com/avoid-the-intelligence-trap/>
- Ministry of Education. (2009). *Basic education core curriculum B.E. 2551*. Agriculture Co-op of Thailand.
- Pakdiwatanakul, K. (2003). *The book of supporting decision making and expert system*. KTP Com & Consult.
- SaeZhong, K. (2010). *The form of volunteer country development camp effected to the understanding and emotion positively of students: Case study Sangsuk camp* [Unpublished master's thesis]. Thammasart University.

- Thailand Development Research Institute. (2015). *TDRI chairman pointed the future of Thai education young generation take most of time in class - The educational quality was evaluated by paper*. <http://tdri.or.th/tdri-insight/20150326-3/>
- The Institute for the Promotion of Teaching Science and Technology [IPST]. (2011). *Mathematics camp manual at the high school level*. Intereducation.
- Treffinger, D. J., Isaksen, S., & Droval, K. B. (2000). *Creative problem solving (CPS Version 6.1™): A contemporary framework for managing change*. Prufrock.
- Wiratchai, N. (1999). *Meta-analysis*. Faculty of Education, Chulalongkorn University.
- Zhong, P. (2015). *The technique of brainstorming to create the new idea of problem solving*. WordPress. <http://www.pisitzhong.com/brainstorming/>