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Research Article

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USING THE DEVELOPMENT MODULE LEARNING OF LEADER TEACHER IN CREATIVE THINKING FOR ENHANCEMENT THE DOCTOR OF PHILOSOPHY PROGRAM EDUCATIONAL ADMINISTRATION AND LEADERSHIP

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ABSTRACT

The purposes of this study were: 1) to study factors of learning management for enhancing critical thinking of students in schools under the Office of Basic Education Commission, 2) to study current context and desirable situations, 3) to create a leader teacher development program, 4) to develop effective leader teacher development program, 5) to evaluate the quality of the developed program, 6) to compare the learning achievement scores, 7) to study learning retention of students, and 8) to study the students' satisfaction on learning through the developed program. The participants were 22 Doctoral degree students. The instruments were the developed program, manual program by Google Classroom, quality evaluation, achievement test, post-operation record form, and questionnaire. Statistics used were percentage, mean, standard deviation, effectiveness index, and t-test. The results were: 1) the elements of the developed program included 10 elements. 2) the overall of current context analysis were found in the highest level 3) the developed program of learning activity management of leader teacher had 8 Module including, 4) the efficiency and effectiveness of the program were: 1) the efficiency of 87.69 (E1)/83.03 (E2) was higher than the committed 80/80 standard, 2) the congruence of utility, possibility, and appropriateness were in the highest level (\bar{x} = 4.76, SD = 0.32), 3) the effectiveness index was 0.5919 which meant students gained more knowledge of 59.19%, 4) the students had significantly higher learning achievement after learning at the level of 0.01, 5) there was no significant differences of learning achievement between after learning and after learning for two weeks at the level of 0.01 also, 6) the students had satisfaction on the developed program in the highest level (\bar{x} = 4.92, SD = 0.14), and 7) students had outcome enhancement strengths for AAR, they have higher skills as follows: 1) online learning by Google Classroom, 2) presentation by PowerPoint, 3) criticism and sharing of knowledge, 3) acquiring knowledge, skills in seeking knowledge crystallized.

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1. INTRODUCTION

In the 21st century, knowledge can be changed as the dynamic of learning. There are some necessary factors: learning and innovation, communication and technology, and cooperation and creating creative innovation. Consequently, learners should have chances to gain knowledge from various sources outside classroom to practice analyzing, criticizing, deciding, solving problems, and creating new knowledge which occurring the integration outside classroom activities and inside classroom. Vicharn Panich (2013: p.1-6) stated that teaching is not like teaching but as advisors who advise learners to have their creative thinking, working together, creating and developing efficiency works. Education is not only the answer of changing, but is the creator of changing as well. The practicing leads to have knowledge and to change from the inside occurring leader-teacher skills. Teachers are the key persons of changing. After setting questions of problems, the curiosities might occur. The teachers should study and find ways to get answers. Consequently, there are some roles of teachers: 1) teachers are people who build inspiration, make the objectives of learning, set questions of problems, have noticing, have studying, make assessment, give feedback, and give evaluation results, 2) teachers are people who prepare learning conditions for learners, and 3) teachers are people who have skills of classrooms and students' management, and PLC-Professional Learning Community. Prawes Wasee (2020) stated that after COVID19, there are new 7 consciousnesses: 1) self-conscious should be wider, 2) self-conscious should be available to new knowledge, 3) self-conscious should be integrative, 4) self-conscious should be developed, 5) self-conscious should have new objectives to promote living with environments, 6) self-conscious should support people properly, and 7) self-conscious should remind the end of old age and the beginning of new age of human capacity.

The roles and duties of teachers must change, not using the narrative as the main method. Not focusing only on theory, but must change the role of learning management for learners to find answers and ask questions on their own. by design Creativity and application of program lessons or learning kits for more learners (Sumon Amornwiwat. 2009: 8). And in line with senior academic, the role of teachers is to build professional learning communities. Which requires new questions as a way to create learning for students in the 21st century who should be happy. How does good learning happen when learners are happy and good? Learning to change is creative at the beginning, middle, and destination, in line with learners' life skills (Vicharn Panich. 2013: 5-9). Therefore, the main role of teachers at both basic and higher education levels is to teach and learn together with learners, co-instructors, learning resources. and continuous research to create additional intellectual value for stability, prosperity and sustainable development.

As a lecturer in the graduate level focused on developing the innovation program with critical thinking on learning management for the secondary school teachers, a case study of the Doctor of Philosophy students in Educational Administration and Leadership in semester 1, 2020 in the Subject of Contrastive Study of Critical Comparative Analysis of Thai Education Management Global and Regional Society (ED41201) by google classroom and engineer lecturers participating was conducted. This meant that integrative modules in learning and studying from learners and doing researches can be effective and productivity.

2. BACKGROUND

Flipped classroom is the new technique of learning management by Jonathan and Aaron, the chemistry teachers at Woodland Park High School in USA focuses on teach less learn more. Flipped classroom comprises online learning, online media, information technology, various communication, and doing activities in classroom. These support learners to practices in class. Moreover, they can have interaction with peer and teachers for creating self-knowledge and individualized competency through self-paced. In 21st century, teachers, lecturers, and educational personnel must learn by doing, thinking, leading themselves to be leaders of changing, directing self-learning, assessing and improving how to learn, and learning in team. Regarding to the study of developing teaching capacity in the project of increasing the learning achievement in the Northeastern of Thailand, Office of the Basic Education Commission by Chalard chantarasombat, Nothai Udombunyanupab, and Norachai Kenchaiyawong (2018, p. 54-69), they divided their research into 3 levels: 1) developing , creating, defining objectives, and creating instruments, 2) studying theories 24 hours and training by doing 66 hours, and 3) increasing the learning achievement of the target groups since the pretest, during the process, and the posttest. The results of the study showed, 1) there were the defined of the objectives, researcher's roles, and co-researcher that cooperated with the team which relating to researchers' need, 2) the teaching capacity was efficiency at 90.70/84.58, the index of effectiveness was 0.7946 or 79.64%, and the achievement of the posttest

was significantly higher than the pretest at the level of 0.01. After learning, training, and developing for 2 weeks, there was a significantly different average of the learning retention, and 3) the teachers' satisfaction was reported in the highest level, This research uses basic knowledge from development Module of developing leading secondary school teachers in creative thinking for enhancement of students' learning activities in Thailand by Chalard Chantarasombat and Ekanun Sombatsakulkit (2021, p.138-149) consistent the program in learning management for enhancing critical thinking of secondary student including: 1) the principal of Program, 2) the objective of program , 3) the goal of the program, 4) the content the program development. The content included into 9 modules: 1) the survey of experiences, 2) the planning, 3) the concepts, 4) the applied concepts, 5) the classroom implementation, 6) the supervision, monitoring and evaluating of the study, 7) the feedback and reinforcement, 8) the seminar for strengthening, and 9) the presentation at the academic conference. The final parts of the module focused on doing activities outside classroom. The researchers defined activities on learning by doing under advising and helping continuously. The learners must have plans, and review the principals from the beginning to face with real practicing. It meant that there were advisors who advice, taught, and gave feedback continuously. This process could make the understanding. The treatment included training, and self-development with 6 steps; 1) preparation, 2) training, 3) understanding, 4) verifying and evaluating, 5) strengthening, and 6) giving feedback. The results from the experts' showed the benefits, possibilities, correcting, and suitability at the highest level ($\bar{X} = 4.69$, $SD = 0.42$).

Integrating google classroom for teaching in classes can change teachers' role from knowledge givers to tutors or coaches who could be the facilitators of learning. Therefore, it is necessity to enhance teachers' capacities in using online teaching with G Suit for Education and Microsoft terms to improve learning management. Regarding to the COVID19 epidemic situation in 2020, online learning was one of important ways to help learners and teachers in university level for organizing remote learning. In semester 3 (April-June, 2020), lecturers chose google classroom in teaching the subject of Seminar for Educational Administration (ED8013203) to the master degree students (Chalard Chantarasombat and Phinit Meekhamtong. 2020: 10-20). The program was effective at 85.67/ 84.00 which was higher than 80/80 committed standard, the index of effectiveness was 0.7567 or 75.64%, the achievement of the posttest was higher than pretest, the score of achievement test after learning 2 weeks of class completion was not different which meant that learners could have learning retention by learning through google classroom, and learners' satisfaction was found at the highest level after learning via the google classroom.

3. RESEARCH QUESTIONS

1. Which factors of learning management for enhancing critical thinking of the secondary school teachers occurred?
2. How was the current and desirable condition of learning management for enhancing critical thinking of the secondary school occurred?
3. How could the program be examined by experts? And how this program could be used with the single team (3-5 people) and group team (9-12 people)?
4. Was the program in the Subject of Contrastive Study of Critical Comparative Analysis of Thai Education Management Global and Regional Society (ED41201) for students effectively at 80/80? How?
5. Was the result from the program be examined by experts? Possibility? Related? And which level of benefits of the program?
6. How much was index of effectiveness of the program occurred?
7. Did the learning achievement of the program of the posttest gain higher scores than the pretest?
8. How was the learning retention of the program shown?
9. How many levels of students' satisfaction on the did they have?

4. RESEARCH OBJECTIVES

1. To study the factors of learning management for enhancing the critical thinking of the secondary school teachers To investigate current and desirable condition of learning management for enhancing critical thinking of the secondary school teachers
2. To create the program of leader-teacher of learning management for enhancing critical thinking of the secondary school teachers by google classroom
3. To develop the program in the Subject of Contrastive Study of Critical Comparative Analysis of Thai Education Management Global and Regional Society (ED41201) for students by using google classroom
4. To evaluate the quality of the leader-teacher of learning management for enhancing critical thinking of the secondary school teachers in the Subject of Contrastive Study of Critical Comparative Analysis of Thai Education Management Global and Regional Society (ED41201) through google classroom
5. To compare pre and posttest scores of the learning achievement through google classroom
6. To investigate students' retention by using the program through google classroom
7. To examine students' satisfaction on the program through google classroom
8. To write students 'outcome on action learning to strengths of ED41201 for After Action Review: AAR

5. SCOPE OF THE STUDY

There were 8 units of the program including:

1) Surveying the former experience, 2) planning, 3) creating comprehension, 4) applying idea, 5) practicing in class, 6) supervision and assessing, 7) giving feedback and giving support, 8) seminar for enhancing strength outcome for AAR by the Profession Learning Community as follow:

1. The Doctor of Philosophy Students in Educational Administration and Leadership (2019) at Northeastern University

2. Quality classroom and school community learning which were: 1) Quality Classroom and School Community Learning and 2) Symposium or Workshop

3. Developing study and active learning were new for improving learning and teaching by clinic supervisor on participating between teachers, administrators and academic person.

4. Profession Learning Community was on duty, teaching, learning, and researching effectively.

6. CONCEPTUAL FRAMEWORK

The role of teachers is to build professional learning communities which require new questions as a way to create learning for students in the 21st century who should be happy. How does good learning happen when learners are happy and good? Learning to change is creative at the beginning, middle, and destination, in line with learners' life skills Sumon Amornviwat (2552). Vicharn Panich (2556) studied "The Development Module of Leader Teacher in Creative Thinking for Enhancement of Students' Learning Activating in Secondary School on Ph.D. Students in Doctor of Philosophy in Educational Administration and Development and Leadership Program", the conceptual framework were determined by experts. The innovation of module consisted of 8 sub-modules including as explained in Figure 1 below:

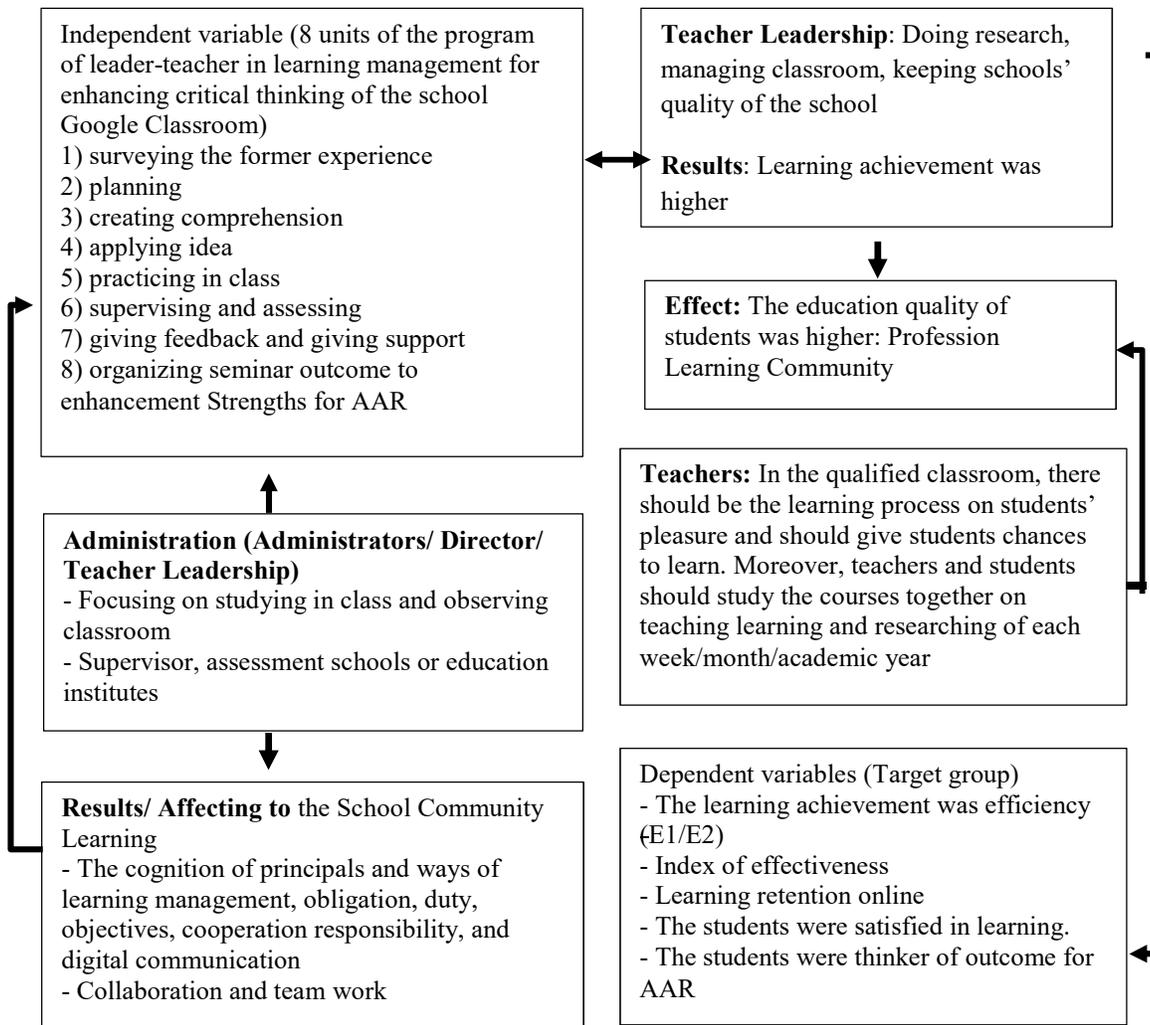


Figure 1: Conceptual Framework of the program of leader-teacher in learning management for enhancing critical thinking (Chantarasombat & Sombatsakulkit. 2021: 140)

7. RESEARCH METHODOLOGY

7.1 Construction and Development of Research Instruments

7.1.1 Steps of setting and finding reliability of the program

7.1.1.1 Brainstorming and planning for developing the program for Doctor of Philosophy Students in Educational Administration and Leadership, Northeastern University, Khon Kaen, Thailand.

7.1.1.2 Investigating concepts, theories, principles, policies, and strategies of educational administration on learning 2. in 21st century. Moreover, the development of leadership by advising and teaching was studied. Creating and developing the Profession Learning Community, Chalard Chantarasombat and Nothai Udombuyyanuparb (2560, p. 2-16), and the developing the program of leader-teacher in learning management for enhancing critical thinking of the secondary school students in the Subject of Seminar for Educational Administration for master degree students in the major of Educational Administration (Chalard Chantarasombat and Phinit Meekumthong, 2020), the researchers concluded all these references and applied them to create the scope of the study and the program for teacher leadership development.

7.1.2 Handing 8 units of the learning program to 5 experts including: 1) Professor Dr. Preecha Phrathepa, 2) Assoc. Prof. Dr. Sunti Wijakkanaluk 3) Assoc. Prof. Dr. Tharinthorn Namwan, 4) Assoc. Prof. Dr. Prasert Reunnakan, 5) Assist. Prof. Dr. Yannapat Srihamonkol to measure and find the relation of the content and learning module. The result showed that lesson plans were appropriate, possible, related, and useful in the

highest level.

7.1.3 Conducting the trials of 8 units of the learning program with the groups of students who were not the target group: 1) group of 3 students, and 2) group of 9 people of the doctoral degree students in Education Administration 1 in semester 2, 2020. The result showed the efficiency was at 85.45/81.56 which was in accordance with the setting standard. Implementing the 8 units to 22 doctoral degree students in Education Administration at Northeastern University, semester 1, 2021.

7.2 The achievement test was developed and measured

7.2.1 Investigating related theories, principles, and concepts to create achievement test on the theory of Bunchom Srisa-ard (2003, p. 60-62).

7.2.2 Multiple choice was applied to create achievement test with 4 choices 70 questions and 60 of them were chosen.

7.2.3 After finished designing the test, it was presented to the same experts to evaluate and find relation between the behavioral objectives and the test. The criteria of grading the test were: 1) +1 when the test was assessed by the behavioral objectives, 2) 0 when the test was not clear from behavioral objectives, and 3) -1 when the test was not assessed by the behavioral objectives.

7.2.4 Analyzing the data to find index of reliability between the questions of the test and behavioral objectives using IOC (Somnuk Pattiyathani, 2001, p. 167). The reliable test must have the reliability value between 0.5 -1.00.

7.2.5 After finding IOC, the test was administered with 20 doctoral degree students, in Education Administration who were studying in semester 2 of 2019 in the subject of Seminar for Educational Administration to observe students' behavior during doing the test.

7.2.6 After doing the test, the scores were calculated to find the difficulty (P) and discrimination power of each question. After calculating, the result showed the P value of the test was between 0.40-0.80 and the discrimination power of the test was between 0.20-0.60. Moreover, the reliability of the test, was 0.81. This proved that the test was appropriate for the implementation.

7.3 The questionnaires of the program comprised 8 parts 45 questions

7.3.1 Investigating theories, principles, and concepts on satisfaction of Transformational Leadership Theories book, theories, research, and educational practicing by Thorn Suntrayuth (2011, p.5-24).

7.3.2 Studying techniques of doing the questionnaire by Bunchom Srisa-ard (2005, p. 63-71).

7.3.3 Investigating the development of 5 points rating scales questionnaire.

7.3.4 Creating the questionnaire based on the objectives.

7.3.5 Presenting the questionnaire to the same experts to assess the relationship between the questions and the objectives.

The criteria were;

+ 1 when the statement was related to the behavioral objectives

0 when the statement was not from the behavioral objectives

-1 when the statement was not related to the behavioral objectives

7.3.6 Analyzing the data to find index of effectiveness between questions of the questionnaire and behavioral objectives using IOC (Somnuk Pattiyathani, 2001, p. 167). The IOC of the questionnaire was at 0.80-1.00. Moreover, the experts suggested that language usage should be edited and rearranged in terms of grammar correction, the sentences should be clearer, and the sentences with similar ideas should be combined into one sentence.

7.3.7 Conducting the trials of questionnaire with 30 people including administrators who gained master degree of Education Administration, and teachers and educational supervisors in Khon Kaen Primary Education Service Area Office from the project of Coaching Teams to increase the quality of education at Khon Kaen Power Hotel. The results were analyzed to find the discrimination power (rxy) of each question

which the acceptable values were between 0.32-0.86. The questionnaires were calculated to find the reliability through the Cronbach -Coefficient by Bunchom Srisa-ard (2005, p. 99-100). The reliability was found at 0.93 which meant that the developed questionnaire was suitable for implementing in this study.

8. DATA COLLECTION AND ANALYSIS

8.1) Data Collection

8.1.1 Theoretical knowledge was collected from pre-test and post-test scores of learning achievement test.

8.1.2 The learning retention was collected after the completion of the developed program within 2 weeks.

The satisfaction was collected from the satisfaction questionnaire.

8.2) Data Analysis

8.2.1 The efficiency and effectiveness of the learning module “The Development Module of Leader Teacher in Creative Thinking for Enhancement of Doctor of Philosophy program in Educational Administration and Leadership” was analyzed by using Mean and Percentage from Brahmawong)1994(as follows:

The efficiency of the learning module was searched for using E1/ E2 Formula as follows:

$$E_1 = \frac{\sum X/N}{A} \times 100$$

$$E_2 = \frac{\sum F/N}{B} \times 100$$

8.2.2 The effectiveness index of the learning module was analyzed by using the following E.I. formula and was analyzed by using the Mean and Percentage of Brahmawong)1994(as follows:

Effectiveness Index)E.I.(= $\frac{\text{The sum of the post-test score} - \text{the sum of pre-test score}}{\text{Student Number X Full Score} - \text{The sum of the pre-test score}}$

8.2.3 The comparison of the learning achievement of the learning module was analyzed through the (dependent sample) t-test by comparing mean values between pre-test and post-test (Srisa-ard’s, 2003(.

8.2.4 The learning retention was analyzed and compared using the t-test)dependent sample(to compare post-test score and score of the test after 2 weeks of program completion by comparing mean values between pre-test and post-test (Srisa-ard’s, 2003(.

8.2.5 The satisfaction on the learning module was analyzed using the Mean value \bar{X} (and Standard Deviation)SD(, by comparing mean values between pre-test and post-test (Srisa-ard’s, 2003(.

9. RESULTS

9.1 The Development Module of Leader Teacher in Creative Thinking for Enhancement of Students’ Learning Activating in students on Ph.D. Students in Doctor of Philosophy Program in Educational Administration and Leadership and the conceptual framework were determined by experts, and improved program in semester 2, 2020, form students have of 9 sub-modules. Change evaluation the innovation of module consisted of 8 sub-modules including as explained in semester 1, 2021. The results of the training course were based on concepts and theories focusing on knowledge building. Understanding and learning through practice a practical and effective trial of the Knowledge Management Leader Teacher in Creative Thinking for Enhancement the Doctor in accordance with the developed sufficiency economy approach in table 1-4 below.

Table 1: Process Efficiency vs. Effectiveness of Results for Developing Knowledge Managers in Leader Teacher in Creative Thinking for Enhancement the Doctor

Number	Score after 2 weeks)60)	Pre-test)60)	Practical Score for program							Post-test (60)
			Survey/ planning)40)	Creative (20)	Applying Idea (20)	Practicing in class (20)	Supervisor assessing (20)	Feedback/ seminar)40(Total practical (160)	
1.	58	40	38	18	18	18	18	38	148	49
2.	58	38	38	18	18	18	18	39	152	56
3.	58	41	37	18	18	17	17	38	145	52
4.	53	39	37	18	17	18	18	38	146	54
5.	57	34	37	18	18	18	18	37	147	50
6.	58	30	37	18	18	18	18	38	149	50
7.	59	34	37	18	18	18	18	38	150	52
8	58	28	37	18	17	18	17	38	144	50
9.	60	28	37	18	17	17	18	38	144	51
10.	60	26	38	17	18	18	17	38	147	50
11.	58	27	38	18	18	18	17	38	149	48
12.	58	29	38	17	17	18	18	37	146	47
13.	58	52	37	18	18	18	18	38	149	50
14.	57	24	38	17	18	18	18	38	151	45
15.	60	42	38	17	17	18	18	38	146	49
16	60	45	38	18	18	18	18	38	149	55
17	59	42	38	18	18	18	18	38	149	52
18	58	28	37	18	18	18	18	38	150	49
19	60	46	38	18	18	18	18	38	149	48
20	58	40	38	18	18	18	18	38	149	50
21	58	28	34	17	17	17	17	36	142	45
22	57	30	34	17	17	17	17	36	142	44
Total	1,280	771	819	380	375	374	361	829	3,087	1,096
\bar{X}	58.18	35.05	37.18	17.27	17.05	17.00	16.41	37.68	148.55	50.59
S.D.	0.21	0.79	0.56	0.56	0.56	0.56	0.56	0.56	0.54	0.67
\bar{X} %	96.96	58.41	92.95	86.36	85.25	85.00	82.05	94.20	87.69	83.03

From Table 1, it was found that the results of evaluating the efficiency of the process and the efficiency of the results of the development of learning resource leaders in planting wild mustard greens. The overall efficiency of the process on the efficiency of the results was 87.69/83.03 which was higher than the criteria at 80/80. The effectiveness index for program was at 0.5919 which explained the resource leader's higher knowledge 59.19%.

Table 2: Comparison of Learning Achievement on Online Learning Program by Using Google Classroom, Subject: ED41201 (Critical Comparative Analysis of Thai Education Management)

Test	Amounts of Students (Ph.D.)	(\bar{X}) (Total 60 Scores)	Standard Deviation)SD)	t	Sig
Pretest	22	35.05	0.79	9.3897**	0.01
Posttest	22	50.59	0.54		

**Sig, 0.01

From Table 2, found that after learning through the Online Learning Program by Using Google Classroom, Subject: ED41201 (Critical Comparative Analysis of Thai Education Management) the posttest scores were higher of the significance score at 0.01.

Table 3: Comparison of Learning Achievement on Online Learning Program by Using Google Classroom, Subject: ED41201 (Critical Comparative Analysis of Thai Education Management)

Test	Amounts of Students (Ph.D.)	(\bar{X}) (Total 60 Scores)	Standard Deviation (SD)	t	Sig
Test 1 (Having a posttest immediately)	22	50.59	0.54	7.8053**	0.01
Test 2 (Having a second posttest again after having the first posttest 2 weeks)	22	58.18	0.21		

**Sig, 0.01

From Table 3, the second posttest after learning through the Online Learning Program by Using Google Classroom, Subject: ED41201 (Critical Comparative Analysis of Thai Education Management) was higher than the first posttest of the significance score at 0.01 which shown that students had durability in learning and this tended to show that their learning will be developed.

And after consideration in each aspects the result of satisfactory for students to lecturer and support have indicator learning was: 1) contents 2) theory teaching skill 3) teaching skill of practical teachers 4) teacher characteristics 5) relationship between teachers and students 6) learning support 7) assessment and evaluation and 8) in summary, the teachers are efficient and effective in teaching and learning as table 4.

Criteria	Teaching Assessment Components	Satisfaction level		Interpretation
		\bar{X}	S.D.	
1 .Contents	1.1 The subjects taught are consistent /covering the setting objectives.	4.86	0.51	The most
	1.2 The content of the teaching is important and useful for practical application.	4.95	0.49	The most
	Total	4.91	0.50	The most
2. Theory Teaching Skills	2.1 Teach step by step, easy to understand	4.59	0.51	The most
	2.2 Describe straight to the point and provide examples to clearly understand	4.82	0.41	The most
	2.3 The use of research results or current information in teaching	4.86	0.51	The most
	2.4 Link the content into the application or career	4.82	0.49	The most
	2.5 Many teaching methods and stimulate student interest	4.82	0.49	The most
	2.6 Use teaching time in value and efficiency.	4.77	0.43	The most
	2.7 Include moral ideas, morality during teaching	4.86	0.41	The Most
	2.8 Assign homework appropriately	4.73	0.45	The Most
	2.9 Gain knowledge, ability in the subjects taught	4.77	0.43	The most
	Total	4.78	0.42	The most
3 .Teaching skills of practical teachers	3.1 Teach step by step, easy to understand follow the learning module lessons	4.82	0.49	The Most
	3.2 Explain / demonstrate / give examples for clearly understand follow methods and procedures	4.91	0.39	The Most
	3.3 Gain knowledge and ability in using equipment /materials	4.91	0.39	The Most
	3.4 The amount of time in practicing, achieve the goals set.	4.77	0.43	The Most
	3.5 Documents / practice manual, clearly explanation	4.82	0.49	The most
	3.6 motivate students to practice	4.95	0.22	The most

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	3.7 The ability to solve problems happen during practice	4.95	0.22	The Most
	Total	4.88	0.40	The Most
4 .Teacher Characteristics	4.1 Firmly emotion, stable, discreet	4.53	0.50	The most
	4.2 polite and appropriate gestures	4.71	0.37	The most
	4.3 Dress modestly	4.71	0.37	The most
	4.4 Neutral Caring for students	4.71	0.37	The most
	4.5 Be a good role model for students	4.59	0.62	The most
	4.6 Punctual in time to attend and stop teaching	4.71	0.37	The most
	4.7 Teaching regularly and learn with students	4.71	0.37	The most
	Total	4.66	0.50	The most
5 .Relationship between teachers and students	5.1 Encourage to comments / exchange experiences	5.00	0.00	The most
	5.2 Encourage to think, critic creatively	5.00	0.00	The most
	5.3 Time for students outside class	5.00	0.00	The Most
	5.4 Assist, counsel individually caused students occupy intellectual skills and analytical thinking	4.95	0.16	The Most
	5.5 Paying attention / being friend to students and encourage both individual and group work	4.86	0.32	The most
	5.6 Students ask questions and promote to work both individual and group work	4.91	0.14	The most
	5.7 Listen to comments / criticisms from students In order to improve	4.94	0.12	The most
	Total	4.94	0.24	The most
6 .Learning support	6.1 Places, learning resources support for teaching and learning activities	4.95	0.13	More
	6.2 Media quality, books, textbook, innovation, lessons, modules and learning sets	4.95	0.13	The Most
	6.3 Media, learning material are interesting and help students understand lessons and lesson modules well.	4.95	0.13	The Most
	6.4 Media, learning material are in accordance with the nature of subject and give examples of case studies	5.00	0.00	The Most
	6.5 General atmosphere support in learning online.	5.00	0.00	The Most
	6.6 Study visit and real practice to display the students learning outcomes	4.95	0.13	The Most
		Total	4.97	0.11
7 .Assessment and evaluation	7.1 Set criteria for appropriate academic assessing performance	4.91	0.14	The most
	7.2 .Evaluation and evaluation of learning / information / activities.	4.91	0.14	The Most
	7.3 Report the results of learning assessment and evaluation and activity practice	4.91	0.14	The Most
	7.4 Assess and evaluate students correctly / fairly	4.91	0.14	The most
	7.5 Provide students with portfolio / assignments for evaluating individual and group work.	4.91	0.14	The Most
	7.6 After learning, the learners had higher knowledge, ability, intellectual skills and good attitude.	4.95	0.13	The most
	Total	4.92	0.13	The More
8 .In summary, the teachers are efficient and effective in teaching and learning.		5.00	0.00	The most
	Total	4.75	0.34	The most

From the table 4, the results of the student satisfaction is in the quality of teaching and teachers and support Course 41201 Internal supervision in the first semester of the academic year 2564 found that the overall satisfaction of the students was at the highest level with an average of 4.75 and a standard deviation of 0.34 with consistent opinions and there are suggestions, strengths, innovation, learning, lessons, modules on internal supervision in the school, resulting in new knowledge to be applied in accordance with the local context.

9.2 The attitudes in After Action Review-AAR on the subject of Critical Comparative Analysis (ED41201) by applying Google Classroom with 8 units: studying and giving presentation, asking, answering, summarizing, applying with learners, and adapting with everyday life. From 6 factors, there were 20 people who share the idea equally 90.91% and in 22 people, there were questions occurred:

1. What do you gain from this subject?

Administration, visions, missions, policies from the old age, the present time, and the future in managing Thai, regions, and world education to compare strong and weak points, problems, and difficulties. Moreover, they tend of education management can bring to develop the education of the country and also duties.

1.2 The strength from comparing between Thai education and oversea education were 1) teachers 'skills in instruction, 2) emphasizing on increasing teachers 'potentials which focusing on learners' abilities in 21st century (3Rs&8Cs), 3) the basic education is interested for both individual and team, 4) teachers are coaching and mentoring. Besides, it should provide the classes for participation between learners, teachers, and administrators at least 5 hours.

1.3 Gaining more skills; 1) offering online learning through Google Classroom, 2) presenting by PowerPoint, 3) critical sharing, and 4) gaining knowledge and skills of Crystal-Based Instructional Model from Prof. Dr. Kriangsak Charoensuk.

1.4 Educational standards in America, Europe Australia, and Asia (Singapore, Japan and China), comparing between Thai education and oversea education by using PISA which comprises 77 countries from UNESCO.

2. Gaining higher learning achievements through the management of doctor of Philosophy Program in Educational Administration and Leadership as follow;

2.1 Morality was in high level

2.2 Comprehension was in high level

2.3 Intellection was in high level

2.4 Cooperation and consciousness were in high level

2.5 Math skills and information technology were in high level

2.6 Administration management and leaders were in high level

3. How do you know you gain more knowledge, skills, experiences, or creative thinking?

3.1 Skills of using technology and internet were better; surfing data, using Google Classroom, communicating through applications, and helping their friends on designing learning inside and outside the classroom to have long life learning.

3.2 There were skills on Critical Comparative Analysis of Thai Studies and World Studies management; Ancient Thai Studies, Critical Comparative Analysis of Thai Studies and America, Europe, Australia, and Asia.

3.3 Bringing knowledge as a teacher and expert from Prof. Dr. Kriangsak Charoensuk on Chance and Challenges in 21st Century about Thai Studies management to other staff in the university in order to learn and apply with the duties.

3.4 There were adaptation, new attitudes, reasonability, job observing, planning to adore working and organizing, and potentials occurred. These could enhance people abilities.

3.5 There was a stimulation to push learners recognizing to their duties and leader status orderly.

4. How online learning through Google Classroom with 5 units can solve problem from COVID 19 circumstances?

4.1 It was appropriate, available, connected and effective by teaching through Google Classroom suitably.

4.2 The content can cover learning objectives suitable since it was agreed from teachers and learners which this content will be improved continuously.

4.3 The specified activities were clear and could be finished on time, even though, some activities had to extend the time by recording. These reasons support learners to study more and continuously.

4.4 There was an assessment so learners could improve themselves endlessly which had the significance at 80/80 and the effective index (E.I.).

4.5 The effective index of a Programmed Instruction applying with Google Classroom 5 units which using in online learning equal writing a textbook or a book.

5. Do learning managements from instructors/experts, learners, and learning sources have the learning innovations and the research of the subjects?

5.1 The instructors prepared the learning innovation unit 5 to support students or leader teachers find their mistakes in trying the Programmed Instruction through Google Classroom. Therefore, this program was applying with the teaching classes in the institute which could be effectively for asking the Academic Contribution.

5.2 There were 2 learners after applying the Programmed Instruction and online learning after AAR (Mr. Muangmon Nethan and Miss Tarika Phumesatan) who started to share knowledge to community. This was very effective because beside learning, there were some people use it immediately.

6. After learning, should this subject be adapted with the career or organizations?

6.1 Review, analyze, and study the availability of the policies of Thai Studies and World management and bring the fundamental factors, format, methods products, and effects to manage education in next 10 years. Based on the MOU in Korea at Renaissance in 2015 and 3Rs&8Cs in 21st century by using PISA, UNESCO has required 77 countries managing education steadily.

6.2 To be the Professional Learning Community (PLC), it should be networks between learning management inside and outside the classroom.

6.3 Institute means school of lives and learning by doing means teaching, and learning with learners. To strengthen the institutes steadily, learning sources should do the research and should develop the innovation in order to increase value of institute and learning sources.

6.4 “Long live learning” was affected from teachers and experts which was the happiness of the people in the period of Multicultural Education. Learners had chances to build the Programmed Instruction systematically which would be criticized to find strength point and weak points in developing the subject of Critical Comparative Analysis (ED41201).

10. CONCLUSION

The factors of critical thinking of the leader teachers comprised 10 factors: 1) various learning activities, 2) motivated activities, 3) learning activities in different places, 4) learning activities on child center, 5) technology in learning management, 6) activities related to daily life, 7) innovation in learning activities, 8) the activities were cooperated with community, 9) the activities were on teaching moral, and 10) the activities were assessed and evaluated.

10.1 The current condition of learning management was reported at the moderate level and the desirable condition at the highest level.

10.2. The program in learning management for enhancing critical thinking included: 1) the principles of the program, 2) the objectives of the program, 3) the goals of the program, 4) the content of the program which included 9 modules; 4.1) the survey of experiences, 4.2) the planning, 4.3) the concepts, 4.4) the applied concepts, 4.5) the classroom implementation, 4.6) the supervision, monitoring and evaluating of the study, 4.7) the feedback and reinforcement, 4.8) the seminar for strengthening, and 4.9) the presentation at the academic conference. The treatment included training, while the self-development consisted of 6 steps: 1) preparation, 2) training, 3) understanding thoroughly, 4) verifying and evaluating, 5) strengthening, and 6) giving feedback. The results from evaluation showed the benefits, possibilities, and suitability reported at the highest level.

10.3. After using the program, the result showed that:

5.3.1 The program had the efficiency of the the learning outcome (E1 / E2) at 87.69/ 83.03 were higher than the criteria at 80/80.

5.3.2 The evaluation from the experts on the teacher of the program found the benefits, possibilities, correcting, and suitability were found at the highest level ($\bar{X} = 4.76$, $SD=0.32$).

5.3.3 The effectiveness index was at 0.5741 explaining that students gain higher knowledge of 57.41%.

5.3.4 The students who learnt through the program gained significantly higher results at the level of .01.

5.3.5 After the completion of the develop program, the students gained similar scores of both the posttest and the test after 2 weeks of program completion gained significantly higher result at the level of .01 the same. It showed that students had the learning retention after learning through the developed program.

5.3.6 The students' satisfaction on the developed program was at the highest level ($\bar{X} = 4.92$, $SD=0.00$). The highest level of Mean values ranking from the descending order were: 1) lecturing and providing the learning Activity Management by lecturer and students and 2) the enhancement for student support system, satisfaction was in "the highest" level ($\bar{X} = 5.00$, $S.D. = 0.00$).

5.3.7 The Students had outcome enhancement Strengths for AAR higher as follows:

1) What do you gain from this subject?

1.1) Online learning through Google Classroom.

1.2) Presentation through PowerPoint, 3) Criticism and sharing of knowledge

1.3) Acquiring knowledge, skills in seeking knowledge crystallized from Professor Dr. Kriengsak Charoenwongsak,

1.4) higher skills as follows:

1.4.1) Online learning through Google Classroom,

1.4.2) Presentation through PowerPoint,

1.4.3) Criticism, share and exchange knowledge,

1.4.4) Acquire knowledge, crystallized knowledge acquisition skills for teachers,

1.4.5) Educational standards of countries in the American, Europe, Australia and Asia such as Singapore, Japan and China, comparing Thai and foreign education using PISA innovation.

2) After learning, should this subject be adapted with the career or organizations?

2.1 Review, analyze, and study the availability of policies of Thai Studies and World management and bring the fundamental factors, format, methods products, and effects to manage education in next 10 years based on the MOU in Korea at Renaissance in 2015 and 3Rs&8Cs in 21st century by using PISA, UNESCO has required 77 countries managing education steadily.

2.2 To be the Professional Learning Community (PLC), it should have networks between learning management inside and outside the classroom.

2.3 Institute means school of lives and learning by doing means teaching, and learning with learners. To strengthen the institutes steadily, learning sources should do the research and should develop the innovation to increase value of institute and learning sources.

2.4 "Long live learning" was affected from teachers and experts which was the happiness of people in the period of Multicultural Education. Learners had chances to build the Programmed Instruction systematically which be criticized to find strength point and weak points in developing the subject of Critical Comparative Analysis.

11. DISCUSSIONS

11.1 There were 10 factors of critical thinking for the leader teachers: 1) teachers prepared various learning activities, 2) teachers presented motivated activities, 3) teachers offered learning activities in different places, 4) teachers offered learning activities, 5) teachers used technology in learning management, 6) teachers offered activities related to daily life, 7) teachers used innovation in learning activities, 8) the activities were cooperated with the community, 9) the activities were on teaching moral, and 10) the activities were assessed for the suitability in the highest level (Suttinun Pakdiwit, 2013, p. 110-112). Results of the evaluation from the experts showed the agreement in high level. When considering on each factor, it was found that the experts agreed with the teachers should prepare various learning activities and implement technology in learning management. It meant that teachers have to use new and appropriate activities in learning management. Thikumporn Bunmak (2015, p.294) conducted the research on developing the teachers' system in learning management with 7 steps: 1) defining the objectives, 2) studying students' characteristic, 3) defining the goals of learning, 4) defining the content, 5) managing learning activities, 6) assessing, and 7) giving feedback. After using this system, it was found as follow: 1) teachers gained more knowledge on learning management at high level, and 2) teachers could manage activities in class, and realized the process of learning management in school. The factors of learning management comprised: 1) presenting problems, 2) individual thinking, 3) group thinking, 4) presenting and discussing, and 5) thinking critically.

11.2 The current condition of learning management for enhancing critical thinking of the school students at the area technical education or Primary Education Service Area Office was found at the moderate level, while the desirable condition was reported at the poor level. When considering the content by ranking from the highest to the lowest, it was self-study. Regarding the Ministry of Education (2009, p.8-9) stating that learning management on child center was accepted on the concept was able to study and improve themselves excellently. Thai language is the signature of our country, because it could enhance the characteristics of Thai people and it is the tool for communication. Moreover, Thai language is the necessary skill to practice until the communication successfully in terms of gaining knowledge, and adapting in daily life. Office of Thai Education Council (2010, p. a-d) conducted the research about the policy of developing teachers and educational personnel, found that: 1) most teacher were not graduated in major that they have been teaching, they had too much worked load, they lacked knowledge of learning management, 2) regarding the condition of learning management found that although learners had been trained but there were some problems from the environments, the learning achievement was low. This might be due to: lacking of desirable characteristics, lacking of critical thinking, lacking of solving problems skills, and lacking of creative thinking. When considering the factor of educational personnel, it was found the difficulties of the organizational structures and administration could cause gaining problems, lacking the qualifies teachers, and lacking skills of finding the qualifies people.

11.3 The program in learning management for enhancing critical thinking was presented to 5 experts for the evaluation, the results revealed that the developed program was at high level ($\bar{x}=4.69$). When analyzing the effectiveness of the program, it was found that the program efficiency was at 85.45/81.56. This revealed that in creating and developing program, the basic information, the condition, problems of learning management, and developing teachers were analyzed to identify issues of developing. Furthermore, the investigation of the scope of the study, theories, and related review in learning management for enhancing critical thinking was conducted to criticize factors occurring. The questionnaires were used to enhance the secondary teachers for supporting them to get the rewards for the innovation of learning management in the northeastern of Thailand. The data from 136 people answering the questionnaire with 9 modules and factors were examined by 5 experts. After that, all factors were combined and defined to find the detail to form the program and documents for presenting to 5 experts later. According to above information, this program was developed through theories, researching, and properly examined by experts leading the program to be effectively and efficiency which responded the objectives of the program on creating knowledge, comprehension, good attitude, and teacher skills for managing learning activities creatively. There were 3 parts for evaluating the program comprising: comprehension, good points of view, and learning management for enhancing critical thinking of the secondary school teachers. According to Boone (1992, p. 49) and Yodanong Jomhongphitak (2012, p. 157) mentioned that there were three ways for developing personnel including concepts, principals, and planning which could be described as follow:

1) There was planning for creating and developing the program. The researchers defined vision and created the structure of the program to achieve the objectives of the program and to enhance people in the experiment, to have vision, and critical thinking in learning management.

2) There were the designing and implementing of the program. The instrument included facilities

and a guide book.

3) There were the assessing and examining. There were the fundamental concepts to define the schedule of the program including: concepts, participatory learning, advising, practicing, supervision, suggestion, giving feedback, and the theories related to the nature of teachers.

12. The program could enhance understanding, attitude, and skills of learning management as discussed below:

12.1 The comparison of the leader teachers before and after using the program found that teachers got significantly higher score at the level of .01. This meant the designed activities in phase 1 could develop critical thinking in learning management of the secondary school teachers. In the scenario of the target group, there were knowledge and understanding in stimulating to self-improvement technique to manage classroom creatively. The roles of the teachers were creating learning activities, sharing knowledge, criticizing, analyzing, understanding and motivating yourselves to change learning management by using various activities for the target group. Consequently, using demonstration could help the participants in gaining knowledge, clearly understanding, observing the format, practicing in the scenario, giving advice, and giving feedback. Wirrote Sararatta (2008, p. 207) presented the principals for developing teachers: 1) realizing in learning phycology of an adult, 2) realizing to the result after developing teachers, 3) developing teachers to think about how to work systematically, 4) developing teachings to be self-learning, 5) changing how to develop teacher from old system to new system, 6) facing teachers' development as a part of regular duties, and 7) emphasizing learning in class, learning from other teachers, and learning from other staff in the school and community. Hence, when improving teaching through that scope, teachers could comprehend how to manage leaning activities well.

12.2 The comparison of learning management before and after using the program found that leader teachers had skills of learning management significantly higher at the level of .01. This meant that phase 2 of the program focusing on doing activities outside classroom, especially, activity 6: implementing the plan, and activity 7: supervising and evaluating encouraged teachers to develop plans and to review the principles from phase 1 to face with real practicing. It meant that there were advisors who gave advices, taught in the program, and gave feedback continuously. This process could create the understanding, the retention of knowledge, and the deep comprehension in learning management creatively. According to Vicharn Phanit (2013, p. 41-45) and Waist Wiangsmute (2009, p. 56) mentioned that developing teachers to have skills in learning management have to use various techniques which would be useful and necessary. Since enhancing skills of learning management creatively, understanding differences individually would be recognized, because it caused the skills of designing learning management individually.

12.3 The efficiency of the developed program was at 86.79% of the total scores of activities and practices /83.03% of the total scores of achievement test were higher than the committed 80/80 standard. The index of effectiveness was 73.97 % which meant that students had retention in learning although 2 weeks after the completion of the program past. This could be concluded that: 1) there was the learning management for students focusing on child center. Learning management by enhancing knowledge helped improve student's ability. So, the developed activities helped support learners to practice because it could improve learner's ability and may be important for studying. According to Pimpan (2011, p. 7) mentioned that learning with the focus on child center was to emphasize on learners to acquire new knowledge and new inventions through thinking process, society process, and enhancing learners in applying learning. Moreover, the module of learning was evaluated at the highest level which affected to other learning modules. Besides, students could study by learning module which could be challenging for their capabilities. The different activities of the program arranging from easy to difficult. The results of the study revealed that students' learning was effective at 84.67/83.00 and there was no difference between the score of the test at the last class of the program and the score of the achievement test after 2 weeks of the completion of the program. This meant that students had learning retention this time, there was a statistically significant difference at 0.01 level. The results of the study were different from the innovation development either in the form of program lessons or the learning series, which the results of the learning durability test comparing the mean within the group and after learning were not significantly different from each other. The statistics shown that the lessons learned using Google Classroom, students are interested and learn 24 hours a day from units 1-8. By Chalard Chantarasombat (2020, p. 31-50), 2) after learning via the developed module which was the inspiration in learning management. and also, was the support of learners to have analytical thinking. Chalard Chantarasombat (2020, p. 31-50) proposed that the index of effectiveness in learning management of students to the module about the policy of strategies (EDA6201) was at 0.6577 or 65.77%. This clearly indicated that students gained more knowledge of 65.77. Moreover, the evaluation and assessment for knowledge, practicing, attitude, behavior, checking assignments, doing exercises,

and informing results helped improve learning activities and to be the learning tools without complex but easier to understand, be inspiration, and clearly understanding to get higher learning achievement. This meant that students could develop learning by studying through the developed module of learning effectively and efficiency. Additionally, Rungarun Papapsit (2018: 65 – 67) studied the innovation for developing potential in doing research in classroom, a case study of self-access learning design and guidance proposed that students' learning achievement was higher than before learning from studying via the learning model with significance at the level of .05.

12.4 The students were satisfied with leader teachers' classroom management for development of teachers teaching Thai for enhancing critical thinking of the students in secondary schools in the course Seminar in Education (ED8013302). Averagely, the satisfaction was scored at the highest level which was possible that the students could learn from learning module containing interesting and various activities to draw their attention effectively. In addition, learning by doing and participating in activities were developed based on the individual differences of students regarding the ideas, theories and principles of learning module instruction. This was consistent with the study of Chompan Na Ayutthaya (19932536: 83-85) which found that to create the learning program, there were 13 steps: 1) The designers needed to consider the general objectives of the curriculum and carefully considered the objectives of the designed lessons to enhance the graduates' potentials in general objectives. In addition, the designed learning activities was necessary to be consistent with the philosophy of learning curriculum. All of these issues should be clarified in the principles and rationales of writing, 2) There should be the specification of learners' potentials that students are going to learn, 3) After specifying the objectives, the course designers must set the basic necessary potentials for students. The potentials should be limited to the specific topics as truly basic standard for each lesson. The basic potentials should be specified to create the flexible learning program and to provide the students' opportunity to select what they want to learn, 4) for the primary evaluation form, the designer should ensure that the criteria for the evaluation can assess the students' potentials due to the objectives. The evaluation must reflect the truth and provide feedback to students. The assessment will be effective when the designers considered the practice which could help diagnose mistakes, 5) To design learning activities, the designers should try different alternatives in order that they could choose what they want to learn and help them succeed as well as selecting the appropriate learning approach to help them. Moreover, students should have opportunity to create learning activity with the help of teacher, 6) the designed learning activities should be well organized appropriately to help students understand the arrangement of the plan, 8) The evaluation after learning should be done in form of suggestions for designing primary evaluation and reliable tests, 9) The designers may create supplementary activity based on the specific situations. After completing learning program, complementary activities could be used as learning activities for students, 10) The description of the module must be short and clear, 11) The designers should have other colleagues to criticize the designed learning activities to improve the efficiency and effectiveness of the lessons, 12) After completing the lesson construction, the designers should review the lesson again to focus on the potentials related to the development of students and to be the best example for effectiveness of learning and teaching, and 13) In the last stage, the designer needed to realize that the designed lesson could be changed which may affect students' satisfaction in learning with the learning model.

12.5 The Students had outcome enhancement Strengths for AAR: they have higher skills as follows: 1) Online learning using Google Classroom, 2) Presentation through PowerPoint, 3) Criticism and sharing knowledge 3) Acquiring knowledge, skills in seeking knowledge crystallized , 4) higher skills: 4.1) Online learning through Google Classroom, 4.2) Presentation through PowerPoint, 4.3) Criticism, share and exchange of knowledge, 4.4) Acquire knowledge, crystallized knowledge acquisition skills for teachers, 4.5 Educational standards of countries in the American, Europe, Australia and Asia such as Singapore, Japan and China, comparing Thai and foreign education using PISA innovation, currently 77 member countries from UNESCO. In line with the needs of students, they are interested in using innovative learning packages to improve the quality of education, characteristics of higher education learners of Nakhon Phanom Technical College (Muangmon Natehan. 2021: Seminar and Reflection) and College of Agriculture and Technology. Chaiyaphum to develop learning management according to roles with pride (Tharika Bhumisathan. 2021: Seminar and Reflection)

13. RECOMMENDATIONS

13.1 Recommendations for Application and Development

According to the results of the research, the designed teacher leadership program could help improve teacher's knowledge, understanding, positive attitude, and skills of learning activity management with creativity. However, there were some suggestions for application as follows:

13.1.1 The administrators and those who involve with the development of quality of education and teachers in secondary education service area and in other educational institutes should apply the designed program which systematically proved by the experts and experimented to be authentically for developing teachers to be knowledgeable and skillful.

13.1.2 For implementing the designed teacher leadership program for learning management in enhancing the critical thinking of the secondary school teachers was effectively with the objectives of the program, the process of using the program continuously both in theoretical part of creative thinking development, and practical part in which secondary teachers practiced teaching in real situations. These processes would help the teachers participating in training be capable to implement knowledge and experience form learning systematically. Evaluation and follow-up sessions were needed to help teachers' suggestions and guidelines as well as advice for teachers during all stages of the program.

13.1.3 Process of learning activities in creative thinking development program was focused on practicing to enhance learning management skills for teachers, applying program needs to emphasize on teachers participating in development program to follow all the stages specified for the program with support of school administrators, and stimulating school supervisors and teachers' colleagues to enhance teachers' knowledge, understanding and positive attitude as well as teacher leadership skill in learning management with the objectives of the program.

13.2 Recommendations for Future Research

13.2.1 For the teachers, there should be the study of the development of teachers' creative thinking in other aspects to cover all teachers' tasks in doing project or in providing students' assistance, and in designing teaching materials.

13.2.2 For the further research, there should be the study to develop critical thinking of teachers who teach Thai through other techniques in order to compare the results of each techniques in developing teachers' critical thinking for learning activity management.

13.2.3 The suggestion for the further research was to investigate whether the knowledge and understanding, skill, and attitude of teachers will be related to creative learning activities.

Appendix

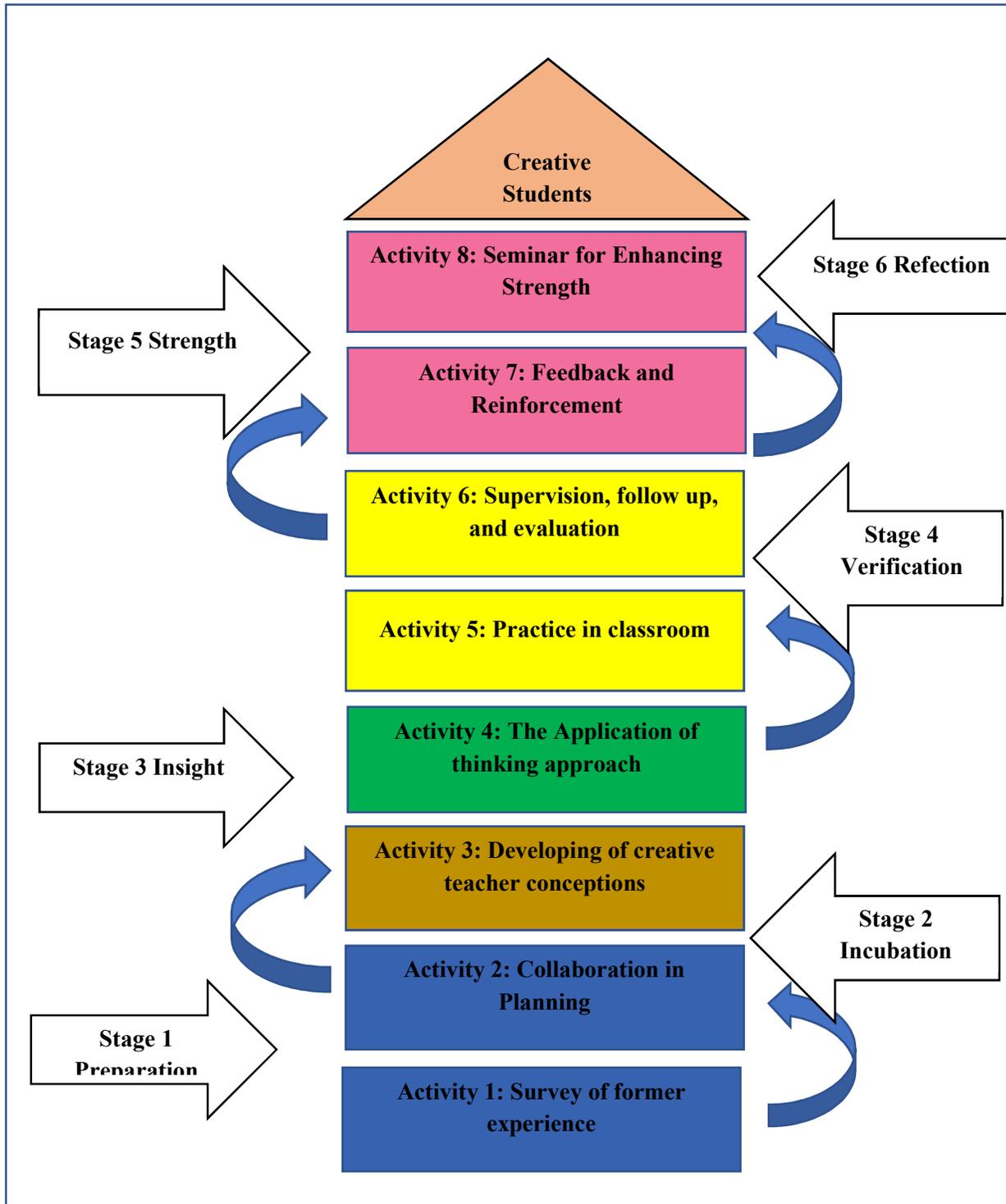


Figure 2: Using Creative Module of Teacher Leadership Program for Learning Management in Enhancing the Critical Thinking of Doctor of Philosophy Students in Educational Administration and Leadership

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