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Professional development of active learning management in primary teachers: Small-sized schools study

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ABSTRACT

The purposes of the research were to develop a model of active learning management for teachers in small-sized schools and implement the model. The research methodology was divided into two phases: In the 1st phase, a model of active learning management was designed and developed, and the model was assessed by seven experts and key informants. In the 2nd phase, the model was implemented through the action research principles to thirteen teachers. The research findings showed that the model of active learning management for teachers in small-sized schools consisted of five steps of the active learning management model: PLC team, brainstorming, learning by doing, sharing and feedback and reflection. The research results indicated that the knowledge and the average skill of the teachers for active learning management are more than the established criteria. The overall satisfaction of the teachers was at a very high level.

1. Introduction

Integrating creative education and creating innovation in educational management is currently necessary for the sustainable development of modern society based on the needs of social movements. A teacher is a key person in improving the desirable skills and characteristics of students (Nuangchalerm, 2017; Darling-Hammond, 2020). Teacher development is critical for both efficient educational management and successful education. The key issues of teachers, according to the OEC (2018), include sources and elements of production, obtaining higher academic positions, teaching, and improvement of teachers' academic standing. Teachers must recognize the significance of continuing education and students' development.

The educational reform of the learning process responding to the change in the 21st century, student-centered instruction, study skills, regular self-development, and new lesson design are recommended. The teacher's role should be changed from teaching to coaching or facilitating students, motivating, and building the inspiration of students, including giving advice for learning methods and arrangement, knowledge development, learning activity design, and creating innovation for students (Orak and İnözü, 2021). The important role of teachers in the 21st century is learning management based on the current context of technology. Teachers take an important role in facilitating and motivating students to create their knowledge. Teachers mainly provide active learning management for students to get knowledge, find answers by themselves, analyze, criticize and solve problems. Consequently, the students are able to find new knowledge and innovation in learning (Anagün, 2018). Active learning is an efficient learning process for encouraging the students to participate and take responsibility in all steps of learning activities in class.

The students who really take responsibility with higher-order thinking for solving problems systematically and creatively are always enabled to interact and share learning experiences with their friends and teacher for achieving the final goal. The previous research indicates that the active learning approach improves learning achievement and positive thinking of the students more than the traditional teaching methods (Wilke, 2003; Yenen and Dursun, 2019; Khan et al., 2017; Aji and Khan, 2019). However, most teachers focus on teaching rather than facilitating the students find and create new knowledge by themselves. The teachers have still used teacher-centered instruction, giving a lecture by using contents in a textbook because they assume that they know more than students.

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Therefore, schools or educational institutes have investigated an appropriate strategy for teacher development based on the national strategies and changes in the 21st century. Therefore, active learning instruction has been promoted to the teachers at all levels in schools (Sawyer, 2019; Kulachit and Nuangchalerm, 2021a; 2021b).

The objective is to provide an active learning approach to the teachers and educational personnel and apply the efficient and effective instructional methods for practical application in their classes. They should be improved their knowledge about active learning methods for creative and active ability based on national strategies. The research employed 2 phases for developing teachers to deal with active learning management and to implement the model of active learning management for teachers in small-sized schools.

2. Methodology

The research methodology was divided into phases; phase 1 and phase 2. Phase 1: The professional development was designed through reliable and flexible methods during the period of pandemic situation. Active learning management was selected as the core content and process to promote small-sized primary teachers. The first phase could be created and designed by inviting 7 key informants who have been working in teacher development and active learning management. The research instruments were a 5-point rating scale by assessment in 4 areas: Accuracy, propriety, feasibility, and utility. The note-taking form of group discussion and documentary report during the discussion were employed. Five sub-phases of the procedure were conducted as follows:

- Initiation phase: Related academic documents, research articles, and review articles about teacher development in active learning management were synthesized. The information was concluded to be a guideline in group discussion from teacher education experts. Then, the guideline was revised and corrected its appropriateness before the online meeting.
- Goal analysis phase: A group online discussion in professional development and active learning management was organized for determining the goal, problem solutions and activities for collaborative development. The issues and recommendations were recorded, analyzed, and concluded.
- Tentative professional development program phase: A tentative program for professional development in active learning management for primary teachers in small-sized schools based on the theoretical concepts, the context of schools, and online group discussion.
- Authentic professional development program phase: An authentic program for professional development in active learning management for primary teachers in small-sized schools was approved by 7 educational experts.
- Revision phase: Professional development program was improved based on the practical suggestions of the educational experts in its should be.

Data were analyzed for judgment a consensus by educational experts, and data were calculated by Interquartile Range (IR) (Glass and Hopkins 1995), its value of Interquartile Range regarding was 1.50. The median index of the data was 2.51 and more.

Criteria for the interquartile range are shown in Table 1.

Table 1: Criteria for interquartile range

Interquartile Range	Interpretation
0.50 – 0.00	Very high level of consistency
1.00 – 0.51	High level of consistency
1.99 – 1.01	Moderate level of consistency
2.99 – 2.00	Low level of consistency
3.00and More	Very low level of consistency

In addition, mean and standard deviation were employed for data analysis. Descriptive statistics were used and interpreted for the requirement of research tools development. Criteria for interpretation of the calculated mean can be interpreted in Table 2.

Table 2: Criteria for interpretation

Mean	Interpretation
4.51-More	Very high level of propriety, feasibility, utility, and accuracy
3.51-4.50	High level of propriety, feasibility, utility, and accuracy
2.51-3.50	Moderate level of propriety, feasibility, utility, and accuracy
1.51-2.50	Low level of propriety, feasibility, utility, and accuracy
1.00-1.50	Very low level of propriety, feasibility, utility, and accuracy

Phase 2: Professional development program was created and evaluated by educational experts, and the implementation was prepared for promoting primary teachers through three spirals based on conducting action research (Kemmis and McTaggart, 1988). Each spiral consisted of four steps of PAOR: Planning, Action, Observing, and Reflecting. The target group of the professional development programs consisted of 13 primary teachers who were volunteers from 3 schools in Mahasarakham province, Thailand. The research instruments included a test of active learning management, an assessment form of 3 points rubric scale, a 5-point rating scale questionnaire on satisfaction with active learning management, an interview form, a note-taking report after using lesson plans, and an observation form.

The instructors, supervisor, trainer, and school administrators assessed the active learning management skills of the teachers from lesson plans and teaching videos. The satisfaction of the teachers with the model of active learning management was surveyed by questionnaires from the target teachers. Data were collected and analyzed based on the criteria of active learning management skills of the teachers. Mean and standard deviation can be interpreted as the level: (2.51-3.00) high level, (1.51-2.50) moderate level, and (1.00-1.50) low level respectively.

The satisfaction of primary teachers with the professional development program of active learning management was analyzed by mean and standard deviation. They will be judged as very high level (4.51-5.00), high level (3.51-4.50), moderate level (2.51-3.50), low level (1.51-2.50), and very low level (1.00-1.50) in respectively. The qualitative data of the report on lesson plans after teaching and interviewing were analyzed by content analysis and research results were reported in the descriptive form.

3. Result

Active learning management for teachers in small-sized schools consisted of 5 major components:

a. PLC team conducted a survey on needs and establishing a professional learning community in school once a week after school on Friday evening and establishing a cross-school professional learning community once a month on Saturday or Sunday. Two channels of a social online networks for communicating, sharing their knowledge, and sending their works on active learning employed Google Classroom and Facebook or Line.
b. Brainstorming technique was employed for analyzing problems, needs, and planning together focusing on active learning management to create strategies for collaborative development and planning.
c. Learning by doing focused on operating all activities orderly and systematically. In the 1st spiral, online training in active learning was organized for the teachers. In the 2nd spiral, active learning design was conducted by the teachers through writing lesson plans for active learning activity design. In the 3rd spiral, teaching and video tape recording: Online and onsite teaching of the teachers was recorded by video.
d. Knowledge sharing was conducted by the teachers during the activities assigned by the trainer in three spirals:

   - The 1st spiral focused on online training, the teachers did the activities assigned by the trainer and shared their knowledge from doing the activities.
   - The 2nd spiral focused on active learning design consisting of three steps: The teachers sent their lesson plans of active learning through Google Classroom, the PLC Team made an appointment of the time for presenting the lesson plans, and the Teachers presented their lesson plans of active learning through an online meeting.
   - The 3rd spiral, teaching, and video tape recording were conducted as follows: 1) the teachers sent the teaching video through Google Classroom, PLC Team made an appointment of the time for presenting the teaching video, the teacher presented the teaching video in school "PLC team for knowledge sharing through the online meeting, teachers of each school selected the best teaching video, and the best selected teaching video of the teachers was presented in PLC team among schools for knowledge sharing through an online meeting.

e. The supervisor examined the data without indicating the feedback of the data but encouraged the teachers to find problem solutions by themselves and conclude feedback of the data about teaching management carefully by themselves for teaching and learning development of the students through online training of the 1st spiral. The trainer took part in giving the feedback by thinking about the feedback carefully without guiding the glues of data about the feedback but motivating the teachers to find the appropriate problem solution. In the 2nd-3rd spiral, the trainer took part in giving the feedback data with careful thinking without guiding the clues of feedback data but motivating the teachers to select the best problem solution. In the 2nd-3rd spiral, four instructors, one supervisor, and three school administrators provided the feedback carefully without guiding but motivating the teachers to find/select the best problem solution by themselves for improving the teaching and learning of the students, including providing the opportunity to the teachers for sharing their opinions on learning management design, and teaching of the target teachers.

Three development activities included online training, active learning design, and teaching and video tape recording. The roles of research participants consisted of school administrators, a supervisor, and university lecturers.

Fig. 1 shows Active learning management for teachers in small-sized schools consisted of 5 major components: PLC team, brainstorming, Learning by doing, Knowledge sharing, and Feedback Conference with Collaborative Reflection. Three development activities included online training, active learning design, and teaching and video tape recording. The 3 spiral.

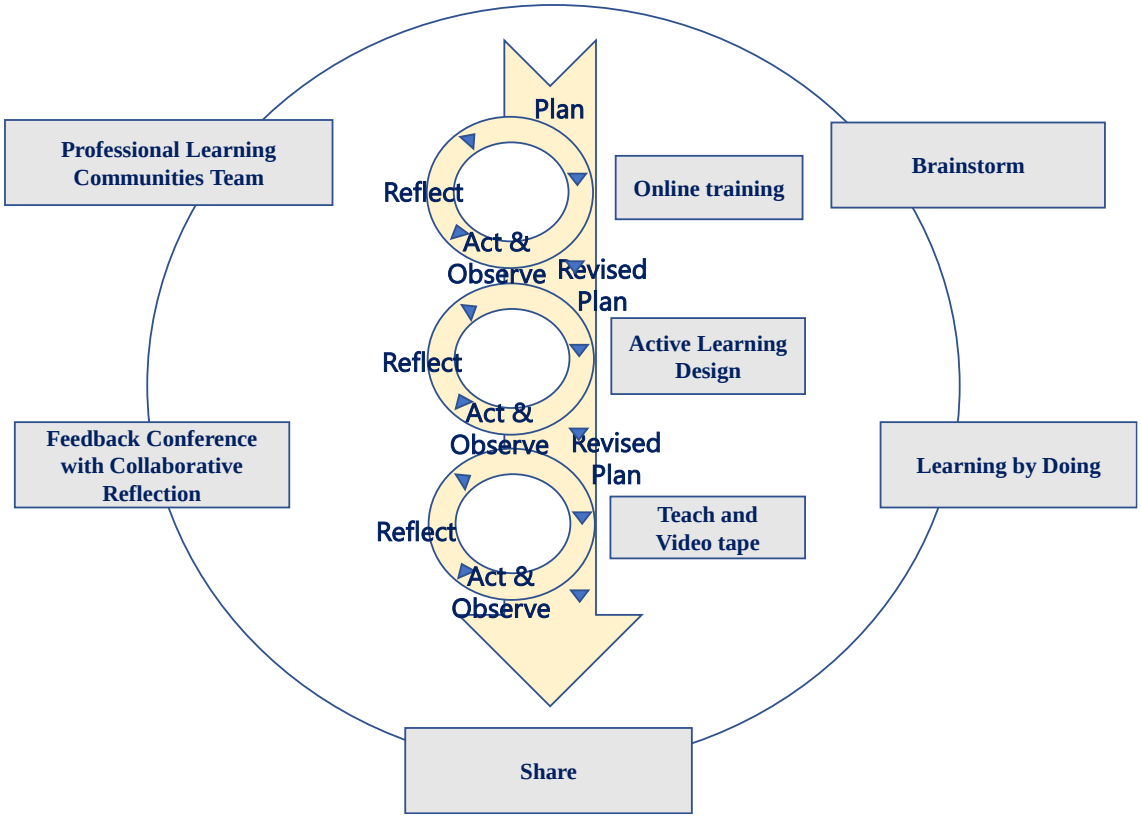

Fig. 1: Active learning management for Teachers in small-sized schools

Table 3 shows the efficiency of active learning management for teachers in small-sized schools was at a very high level. The 4 high-rated items of the model were accuracy, the propriety of activities/steps and utility, and feasibility of practical application respectively. The results indicated that the model regarding the opinions of the experts was consistent. The Interquartile Range (IR) was 0.00 to 1.00 not more than 1.50. The results indicated that the opinions of the experts on the model were consistent.

Table 3: Active learning management for teachers in the small-sized schools

Assessment of the model	Mean	SD	Degree of opinion	Q_3	Q_1	Mdn	IR
1. Accuracy	4.68	0.48	Very high	-	-	-	-
1.1. Concepts	4.43	0.53	Very high	5.00	4.00	4.00	1.00
1.2. Objectives	5.00	0.00	Very high	5.00	5.00	5.00	0.00
1.3. Steps/Activities	4.57	0.53	Very high	5.00	4.00	5.00	1.00
1.4. Roles of the participants	4.71	0.49	Very high	5.00	4.00	5.00	1.00
2. Propriety	4.77	0.43	Very high				
2.1. PLC team	4.71	0.49	Very high	5.00	4.00	5.00	1.00
2.2. Brainstorming	5.00	0.00	Very high	5.00	5.00	5.00	0.00
2.3. Learning by doing	5.00	0.00	Very high	5.00	5.00	5.00	0.00
2.4. Knowledge sharing of active learning	4.43	0.53	Very high	5.00	4.00	4.00	1.00
2.5. Feedback conference with a collaborative reflection	4.71	0.49	Very high	5.00	4.00	5.00	1.00
3. Feasibility	4.93	0.26	Very high	-	-	-	-
3.1. Concepts	5.00	0.00	Very high	5.00	5.00	5.00	0.00
3.2. Objectives	5.00	0.00	Very high	5.00	5.00	5.00	0.00
3.3. Steps/activities	4.71	0.49	Very high	5.00	4.00	5.00	1.00
3.4. Development activities	5.00	0.00	Very high	5.00	5.00	5.00	0.00
3.5. Roles of the participants	4.86	0.38	Very high	5.00	5.00	5.00	0.00
4. Utility	4.77	0.43	Very high	-	-	-	-
4.1. Efficiency of the model in active learning management skills for the teachers	4.71	0.49	Very high	5.00	4.00	5.00	1.00
4.2. Influencing the positive attitude of the teachers toward active learning management	4.57	0.53	Very high	5.00	4.00	5.00	1.00
4.3. Creating collaborative working between teachers and school administrators	5.00	0.00	Very high	5.00	5.00	5.00	0.00
4.4. Creating the process for PLC in schools and out of schools	4.86	0.38	Very high	5.00	5.00	5.00	0.00
4.5. Practical application of the teachers for technology	4.71	0.49	Very high	5.00	4.00	5.00	1.00
Average	4.79	0.41	Very high	-	-	-	-

The implementation of active learning management for teachers in small-sized schools through three spirals of action research principle. Each spiral consisted of four steps (PAOR): Planning, Action, Observing) and Reflecting. The 1st spiral: Online training, the 2nd spiral: Active learning design,

and the 3rd spiral: Teaching and video tape recording. The results of the model implementation were as follows.

Assessment results of the 1st spiral (online training) indicated that 75.38% of the teachers understood precisely the active learning management, which was higher than the established criteria (70%).

Assessment results of the 2nd spiral (active learning design) showed that the average skill of the teachers in the small-sized schools for active learning management was at a moderate level or (72.57%), which was higher than the established criteria (70%). Four moderately rated items of the active learning management skills were active learning (76.19%), active Learning activity management (75.24%), teaching materials (71.85%), and assessment and evaluation (66.98%) respectively.

Assessment results of the 3rd spiral by teaching and video tape recording, indicated that the average skill of the teachers in the small-sized schools for active learning management was at a moderate level (75.97%), which was higher than the established criteria (70%). Four moderately rated items of the active learning management skills were active learning (79.84%), active learning activity management (78.10%), teaching materials (76.40%), and assessment and evaluation (69.52%) respectively.

Table 4 shows active learning management skills in assessment results of the 2nd-3rd spiral.

Table 4: Active learning management skills

Active learning management skills	Spiral 2			Spiral 3		
	Mean	SD	%	Mean	SD	%
1. Active learning management design	2.29	0.92	76.19	2.40	0.90	79.84
2. Active learning management	2.26	0.92	75.24	2.34	0.91	78.10
3. Teaching materials	2.16	0.77	71.85	2.29	0.84	76.40
4. Assessment and evaluation	2.01	0.75	66.98	2.09	0.78	69.52
Total	2.18	0.74	72.57	2.28	0.82	75.97

The overall satisfaction of the teachers in the small-sized schools towards active learning management was at a very high level. Four high-rated items of satisfaction with the model of active learning management were propriety of the development, the feasibility of the practical application, utility, and efficiency respectively.

Table 5 shows the four highest-rated items of satisfaction with the model of active learning management propriety of the development, the feasibility of practical application, utility, and efficiency.

Table 5: Satisfaction of the teachers in the small-sized schools

Items	Mean	SD	Level of satisfaction
1. Utility	4.57	0.56	Very High
1.1. The development model served your needs	4.85	0.38	Very High
1.2. The development provided you precise understanding and improved active learning management skills	4.38	0.65	High
1.3 .The development improved your confidence in applying the new knowledge to your class	4.46	0.66	High
1.4 .The development model created a PLC process in school and of school	4.38	0.51	High
1.5. The development model created the collaboration between school administrators and teachers	4.77	0.44	Very High
2. Feasibility of Practical Application	4.58	0.56	Very High
2.1. Practical application of the development model in the classroom	4.62	0.65	Very High
2.2. Practical application of the development model for a variety of active learning management activities	4.46	0.66	High
2.3. Practical application of the development model for all different classes and different subjects	4.69	0.48	Very High
2.4 .Practical application of the development model for the next semester	4.54	0.52	Very High
2.5. Advantage of the development model for saving time and money	4.62	0.51	Very High
3. Propriety of the development	4.62	0.52	Very High
3.1. The development model of active learning management relating to school curriculum	4.85	0.38	Very High
3.2. The development model of active learning management suitable to the school context	4.54	0.52	Very High
3.3. Flexible process of the development model	4.46	0.52	High
3.4. The development model focusing on collaboration	4.77	0.44	Very High
3.5. The development model enhances the abilities of the teachers in producing teaching materials	4.46	0.66	High
4. Efficiency of the development	4.54	0.50	Very High
4.1. The process of the PLC Team in school based on the target goal	4.46	0.52	High
4.2. The process of PLC Team among schools based on the target goal	4.38	0.51	High
4.3. Collaborative planning for the development through brainstorming based on the assigned plans	4.54	0.52	Very High
4.4. Knowledge sharing of active learning increases the abilities of the teachers' active learning design and practical application	4.77	0.44	Very High
4.5. Process of feedback and reflection assisting the teachers in making the decision and increasing confidence in active learning management	4.54	0.52	Very High
Total	4.58	0.53	Very High

4. Discussion

The active learning management for teachers in small-sized schools consisted of five steps: PLC team, brainstorming, learning by doing, sharing, and feedback and reflection. The research study was consistent with the previous research study by Acheson and Gall (1980) consisted of three processes: Planning conference, Classroom observation, and Feedback conference. Stoll et al. (2006) revealed that PLC provided collaborative networks in school and among schools for sharing, transfer of practice, development of deeper understanding, and creating new knowledge about effective learning and teaching. The findings were consistent with the study of Mundschenk and Fuchs (2016). The findings showed that PLC was able to fill the gap of the practice in school and in the classroom because the teachers focused on the learning with the students and self-visualization. Additionally, the technique provided useful data for the teachers to solve the actual problems in the classroom completely. The research results were consistent with the study on "the model development of teachers' competencies for education in the 4.0 Era of Sucharitrak and Pilachai (2021). The results showed that the model development of teachers' competencies for education in the 4.0 Era consisted of seven components: 1) activities for teaching development, 2) supervision and monitoring, 3) using technology for learning development, 4) self-study and self-development, 5) creating networks, teamwork, and collaboration, 6) reinforcement and 7) change of the functions.

The author conducted the activities of the PLC team through the online meetings of the whole school for 1-2 hours twice a month, and cross-school for 1-2 hours once a month. Facebook or Line was an appropriate social networks for communication and cooperation. Google Classroom was created to send academic works, questionnaires, and some useful suggestions the instructors, a supervisor, and school administrators to the teachers conveniently because of the COVID-19 pandemic. Sullivan and Glanz (2013) asserted that the appropriate and efficient way for voluntary students to participate in the professional learning development project for two hours once a month is practical and efficient in knowledge sharing and creating long life learning community and positive friendships continuously.

The brainstorming technique was employed for analyzing the problems and needs of active Learning management. The technique provided all participants for sharing their opinions, plan, find appropriate solutions, and view all sides of the problems. The students have got knowledge by themselves. The results are consistent with the Cone of Experience of Dale (1969). The study revealed that doing the real thing, simulating the real experience, and doing a dramatic presentation improves 90% of what we both say and do. OEC (2013) reported that learning by doing was one of the major components of teacher development in six small-sized schools.

Knowledge sharing has been an important component of the professional learning community, the study showed that knowledge sharing was one of the major components of learning management because the strategy provided all participants to open their mind, care for colleagues and share knowledge (OEC, 2012; Khan et al., 2021).

The step focused on feedback conferences with a collaborative reflection by instructors, a supervisor, and school administrators without giving clues, but motivating in thinking, and selecting problem solutions. The teachers selected the procedure by themselves, encourage the teachers to think carefully and reflect on learning management by themselves for teaching and learning development of the students. Supervisors should encourage teachers to reflect and think about their work performance in all learning and teaching areas (Sullivan and Glanz, 2013).

The results of active learning competency development of the teachers in the 1st spiral by using the strategies for teacher development was the workshop, teachers understood active learning management. It may be caused by online training, the training course was organized, and the active learning skills were assessed by the online test focusing on theories. The overall satisfaction of the teachers with the model of active learning management was at a very high level. However, school administrators should organize PLC in school 1-2 times a week and with other schools 1-2 times a month based on collaborative goals and planning. Supervisors should give feedback conferences and collaborative reflections without giving clues but motivate in thinking, select problem solutions, learning by doing for teaching and learning development of the students (Medina et al., 2018; Supising et al., 2020). The results were consistent with the study of Boonvas et al. (2019) on the "Development of active learning through professional learning community model for nurse educators" or the PLERNS model. The knowledge, attitude, and active learning skills before using the PLERNS model were higher than those before using the PLERNS model at the .01 level of statistical significance. Four moderate-rated items of the active learning skills were active learning design, active Learning management, teaching materials, and assessment and evaluation respectively.

5. Conclusion

The teachers in small-sized schools could promote their active learning and conduct 5 steps in active learning management by the professional learning community team, brainstorming, learning by doing, sharing feedback, and reflection. Teachers had understanding of instructional skills in active learning management, and they had a very high level of satisfaction with the professional development

programs. The instructional practices and professional development program need to be discussed and more expanding in the current situation by approaching in more flexible and need to continue in professional development.

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Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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