The Development of Learning Activities using Activity-Based Learning to Enhance Creative Learning Management Ability of Pre-Service Teachers

[1] [2] Faculty of Education, Silpakorn University, Nakhon Pathom, Thailand
[1]sithchon@hotmail.com, [2]akesit.ch@gmail.com
*Corresponding Author e-mail: sithchon@hotmail.com

Abstract - This study was aimed 1) to develop instructions using Activity-Based Learning (ABL), 2) to study the effectiveness of the instructions using ABL, namely: 2.1) Pre-Service Teachers’ learning outcomes; 2.2) the Pre-Service Teachers’ creative instruction ability; 2.3) the ability of instruction; and 2.4) the Pre-Service Teachers’ feedback on ABL instructions. The samples consisted of 28 undergraduate students in Art Education Program, Faculty of Education, Silpakorn University, studying in Semester 1, Academic year 2020, selected by purposive sampling. The instruments used included: 1) ABL instructions; 2) a 30-item comprehensive test; 3) assessment on creative instruction design ability; 4) assessment on creative instruction ability; and 5) questionnaire of the students’ feedback towards the instructions. The statistics was conducted with mean and standard deviation.

The findings revealed that: 1) The ABL instructions for promoting creative instruction design ability Pre-Service Teachers of Faculty of Education, Silpakorn University, consisted of 6 steps, called DEEECEE, namely: Step1 Draw attention (D); Step 2 Experience learning (E); Step 3 Engage in activities (E); Step 4 Construct new knowledge (C); Step 5 Exchange knowledge (E); and Step 6 Evaluate outcomes (E). 2) After providing the instructions, 13 students gained the score at a good level (21-25 points), with 46.43 percent. 3) The creative instruction design ability, in overall, was at a very good level, with (x = 93.17). 4) The instruction ability was at a very good level (with 89.84/100 points) and 5) The students’ feedback towards ABL instructions was at a high level (x = 4.27, S.D. = 0.68).

Keywords— Creative Learning Management, Activity-Based Learning (ABL), Pre-Service Teachers

I. INTRODUCTION

Teachers’ competencies in the 21st Century are to be able to (1) use a wide variety of assessment strategies, (2) use communication techniques effectively, (3) continuously participate in professional activities for personal and school development, (4) use appropriate techniques and strategies to encourage students thinking, (5) implement various teaching strategies, (6) have ethics of teaching profession, (7) arrange environment to promote the development of learning, (8) have comprehension of the subject matter, (9) create atmosphere of learning, (10) plan instructions and follow the plans with diversity, (11) work with other fellow teachers, parents and educators and (12) use appropriate technology in learning management [1].

Faculty of Education, Silpakorn University, produces students to be professional teachers. They need to be trained for clear understanding based on teacher’s statement, for instance contents to use in the instructions, appropriate teaching methods to various subjects, behavior as appropriate as being a teacher, mannerism based on the code of teaching profession ethics, including knowledge of teaching profession standards in various matters, especially curriculum standards as it is the core of teaching at all levels, especially the basic education. Therefore, the pre-service teachers are required knowledge and understanding, and enable to develop the curriculum as well. The pre-service teacher development focuses on all aspects which mean they should be developed to become knowledgeable and skillful in all areas such as being knowledgeable and understandable of new teaching techniques, be able to use various tools with effectiveness including to keep up with what happened or changes in the current society, etc. [2] especially learning activities, namely: instruction design, learning material design, selection of learning resources, assignment and task design, as well as learning measurement and evaluation, Design of work pieces and workloads, including etc.

462 202 Course – Learning Management and Classroom Management of Bachelor of Education Program, Faculty of Education, Silpakorn University, is a course that allows the students to learn about learning styles and instruction development, learning experience organization and design and enable to create the lesson plans from course syllabus throughout the semester, techniques and learning management science, use and production of media and learning innovation development, student-centered instructions, classroom management, and assessment of learning outcomes. Moreover, The pre-service teachers are able to provide activities that promote the students’ learning and classify the students’ learning level from the assessment by allowing the pre-service teachers to practice both inside and outside the classroom with a variety of instructions. Therefore, the instruction in this course emphasizes the pre-service teachers acquire knowledge from theory to practice in order to prepare themselves for internship in the fifth year. ABL is the instructions developed from a concept of
pedagogy disseminated in the late 20th century, called "Active Learning. This refers to the teaching format that focuses on encouraging learners' participation and their roles. "Activity-based learning” means using activities as a base for training or developing the learners in order to achieve a defined objective or goal [3]. An important characteristic of ABL instructions is to encourage the students to be active and enthusiastic towards thinking. It also causes learning from the learner themselves, rather than listening to the teacher and memorization. Furthermore, it develops the student's skills for self-learning that causes continuous learning, including obtaining results in knowledge transfer which is similar to other forms of learning. However, it works better in developing skills of thinking and writing. The activities are in forms of exploratory, constructive, and expressional activities, for example class discussion, think-pair-share, role play, situational learning, or game.

However, in accordance with the importance of ABL instructions, if it is used in the instructions, it can develop the pre-service teachers to be knowledgeable and competent on designing and providing the instructions with creativity. The researcher, as a teacher of Curriculum and Supervision Program, responsible for 462 202 Course - Learning Management and Classroom Management, Bachelor of Education Program, Faculty of Education, Silpakorn University, is therefore interested in developing the pre-service teachers to gain knowledge and ability on the ABL instructions.

II. RESEARCH OBJECTIVES

1. To develop an instruction using ABL to promote creative instruction design abilities of pre-service teachers, Faculty of Education, Silpakorn University.
2. To study the effectiveness of the instructions using ABL as following aspects:
   2.1 The learning outcomes of undergraduate pre-service teachers enrolling in Learning Management and Classroom Management Course.
   2.2 The creative instruction design ability of undergraduate pre-service teachers enrolling in Learning Management and Classroom Management Course.
   2.3 The instruction ability of undergraduate pre-service teachers enrolling in Learning Management and Classroom Management Course.
   2.4 The students’ feedback on the instructions using ABL.

III. LITERATURE REVIEW

Activity Based Learning (ABL) is the instructions developed from a concept of pedagogy disseminated in the late 20th century, called "Active Learning. This refers to the teaching format that focuses on encouraging learners' participation and their roles. "Activity-based learning” means using activities as a base for training or developing the learners in order to achieve a defined objective or goal [3]. An important characteristic of ABL instructions is to encourage the students to be active and enthusiastic towards thinking. It also causes learning from the learner themselves, rather than listening to the teacher and memorization. Furthermore, it develops the student's skills for self-learning that causes continuous learning, including obtaining results in knowledge transfer which is similar to other forms of learning. However, it works better in developing skills of thinking and writing. The activities are in forms of exploratory, constructive, and expressional activities, for example class discussion, think-pair-share, role play, situational learning, or game. According to the study of related documents and research papers, the researcher has synthesized ABL instructions into 6 steps [5][6][7][8][9][10], which are: 1) Draw Attention; 2) Experience Learning; 3) Engage in Activities; 4) Construct New Knowledge; 5) Exchange Knowledge; and 6) Evaluate Outcomes.

IV. RESEARCH METHODS

This study was conducted with Pre – Experimental Research using One – Group Pretest - Posttest Design [4]

<table>
<thead>
<tr>
<th>Experiment</th>
<th>Posttest</th>
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<tbody>
<tr>
<td>X</td>
<td>T₂</td>
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</table>

Research Instruments
2. Comprehensive test on 4 units of the instructions with 30 items.
3. 5-point scale assessment on the creative instruction design with 20 items.
4. 5-point scale assessment on the instructions with 5 aspects.
5. 5-point scale questionnaire of students’ feedback on the instructions using ABL with 4 aspects.

Creation and Quality of Instruments
1) ABL Instructions
   1.1) Study and analyze documents and research papers regarding ABL instructions for undergraduate pre-service teachers (both Thai and international studies)
   1.2) Synthesize and design ABL instructions with 6 procedures as follows: Step 1 Draw attention, Step 2 Experience learning, Step 3 Engage in activities, Step 4 Construct new knowledge, Step 5 Exchange knowledge, and Step 6 Evaluate outcomes.
   1.3) Propose ABL instructions to 3 experts.
   1.4) Define 4 learning units to use in ABL instructions and practicing in schools.
2) Comprehensive test on instructions
   2.1) Study and analyze documents related to Techniques for Learning Management, Media Production and
2.2) Create the comprehensive test for 4 units which are Techniques for Learning Management, Media Production and Learning Innovation Development, Measurement and Evaluation, and Classroom Management in 462 202 Course - Learning Management and Classroom Management. The test is multiple choice examination with 4 choices and there are 30 items.

2.3) Propose the comprehensive test to 3 experts in order to examine the Index of Item Objective Congruence (IOC) of the instruments if the IOC score is ≥ 0.50 or higher.

2.4) Try out the comprehensive test with 27 third-year students of Physics Program, Semester 1 of the academic year 2020, in order to verify quality of the instrument using difficulty criterion between 0.20-0.80. In addition, The discrimination of the test is examined how well it can distinguish the students' high and low proficiency levels as of the value of 0.20 or higher. Reliability is examined by Kuder-Richardson's formula - KR-20, with the value from 0.75 onwards.

3) Assessment of creative instruction design

3.1) Study and analyze documents and research papers related to instructions, instruction design and lesson plan creating

3.2) Create 5-point scale assessment on creative instruction design ability with 21 items.

3.3) Propose the assessment of creative instruction design to 3 experts to examine content validity, language used and measurement and evaluation in order to find IOC. IOC analysis must be 0.50 or higher.

4) Assessment of creative instruction ability

4.1) Study and analyze documents and research papers related to instructions and competency of instructions.

4.2) Create 5-point scale assessment on creative instruction ability for 5 aspects with 22 items.

4.3) Propose the assessment of creative instruction ability to 3 experts to examine content validity, language used and measurement and evaluation in order to find IOC. IOC analysis must be 0.50 or higher.

5) Questionnaire of students’ feedback on ABL instructions

5.1) Study the format and method of creating the questionnaire of the students’ feedback on ABL instructions.

5.2) Construct the questionnaire of feedback on ABL instructions by dividing into 2 sections:

Section 1 The questionnaire of students’ feedback on ABL instructions in 462 202 Course – Learning Management and Classroom Management, asking in these following aspects: 1) ABL instructions; 2) Materials; 3) measurement and evaluation; and 4) benefits of the courses. The questionnaire was conducted with 5-rating scale and there were 20 items.

Section 2 The questionnaire was an open-ended form regarding the students’ feedback on the instructions and suggestions for improvement with 1 items by having the students write their opinions towards ABL instructions.

5.3) Propose the questionnaire to 3 experts to examine content validity and find IOC of the instrument from the experts’ feedback by choosing the questions with IOC value of ≥ 0.50, which means the questionnaire is valid.

Experiment

The experiment was divided into 3 stages as following:

1. Pre-research Stage: the researcher provided the instructions using ABL with 6 steps of DEECEE and used designed research instruments as following:

1.1 The experiment with 4 units took 8 weeks, 4 hours per day, 32 hours in total.

1.2 The content used for the experiment was 462 202 Course - Learning Management and Classroom Management, with 4 units which are Techniques for Learning Management, Media Production and Learning Innovation Development, Measurement and Evaluation, and Classroom Management.

1.3 The students were divided into groups and practice designing the instructions.

1.4 The researcher evaluated the instruction design of each group.

1.5 The researcher provided the instructions.

2. Implementation Stage

2.1 The researcher assigned advisory teachers of Tessaban 2 Watnaseha (Samakphonphadung) School, which is one of the schools that participates in teaching development program and offers the students to implement the designed instructions on October 19 and 26, 2020.

2.3 The researcher assigned advisory teachers of Grade 7-9 of Tessaban 2 Watnaseha (Samakphonphadung) School to evaluate the creative instruction design ability from lesson plans and evaluate the pre-service teachers’ ability on creative instructions.

3. Post-research Stage: After completing the experiment, the researcher conducted posttest using the 4-unit comprehensive test on the instructions, with 30 items. In addition, the students completed the questionnaire regarding feedback on ABL instructions. The results of feedback were then analyzed with statistics.

V. RESEARCH RESULTS

1. ABL instructions: to promote the pre-service teachers' creative instruction design ability, Faculty of Education, Silpakorn University, employed 6 - step approach called DEECEE, which are: Step 1 Draw attention; Step 2 Experience learning; Step 3 Engage in activities; Step 4 Construct new knowledge; Step 5 Exchange knowledge; and Step 6 Evaluate outcomes. The details are as following:

Step 1: Draw attention, stimulate and draw interest of the students using questions, illustrations, or clips on such topics to enhance the prior knowledge and connect to new experiences.

Step 2: Experience learning, provide content about techniques of learning management science, learning materials, measurement and evaluation, and classroom management for the students.
Step 3: Engage in activities, provide the instructions through games, competition in the form of single player, pair and team, with rules, conditions, and points.

Step 4: Construct new knowledge, practice designing tasks and assignments as specified on the topics studied to be interesting and creative.

Step 5: Exchange knowledge, present the tasks and assignments according to the content of each learning strand.

Step 6: Evaluate outcomes, discuss, evaluate, share ideas criticize the tasks and assignments on activities, approaches, materials, and methods of self and peer measurement and evaluation, along with improve the works.

Figure 1 The 6-step ABL instructions called “DEECEE”

2. The results of knowledge and understanding of the pre-service teachers using ABL instructions with the 6-step DEECEE with 4 units: after the instructions provided, 13 students gained score in a good level (21-25 points), or 46.43 percent, which is in accordance with the first hypothesis. Followed by 9 students gained the score in an average level (16-20 points), or 32.15 percent, 4 students gained the score in a very good level (26-30 points), or 14.29 percent, 2 students gained the score in below average level (11-25 points), or 7.15 percent, respectively. The details are as shown in Table 1.

Table 1 The results of knowledge and understanding of the pre-service teachers

<table>
<thead>
<tr>
<th>Score out of 30</th>
<th>Outcomes</th>
<th>Number of students (28)</th>
<th>Average Score</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-26 Scores</td>
<td>Very good</td>
<td>4</td>
<td>14.29</td>
<td>3</td>
</tr>
<tr>
<td>25-21 Scores</td>
<td>Good</td>
<td>13</td>
<td>46.43</td>
<td>1</td>
</tr>
<tr>
<td>20-16 Scores</td>
<td>Average</td>
<td>9</td>
<td>32.15</td>
<td>2</td>
</tr>
<tr>
<td>15-11 Scores</td>
<td>Below average</td>
<td>2</td>
<td>7.15</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>28</td>
<td>100</td>
<td>-</td>
</tr>
</tbody>
</table>

3. The results of the pre-service teachers’ creative instruction design ability, in overall, the score was in a very good level (\( \bar{X} = 93.17 \)) from the full score of 110, which is in accordance with the second hypothesis. When considering in each group, it revealed that all groups gained the score in a very good level. The details are as shown in Table 2.

Table 2 The results of the pre-service teachers’ creative instruction design ability

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Competency Level 105 Scores (Groups)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Total (21 Items)</td>
<td>96</td>
</tr>
<tr>
<td>Competency Level</td>
<td>Very good</td>
</tr>
</tbody>
</table>

4. The results of the pre-service teachers’ instruction ability was in a very good level (89.84 points out of 110 points), which is in accordance with the third hypothesis. When considering in each group, it revealed that Group 1 and 5 had scores in an excellent level, followed by Group 2 and 4 that had scores in a very good level, and Group 3 and 6 had scores in a good level, respectively. The details are shown in Table 3.

Table 3 The results of the pre-service teachers’ instruction ability

<table>
<thead>
<tr>
<th>No.</th>
<th>Particulars</th>
<th>Competency Level</th>
<th>Average Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Teacher (4 Items 20 scores)</td>
<td>12</td>
<td>16.50</td>
</tr>
<tr>
<td>2</td>
<td>Content (3 Items 15 scores)</td>
<td>12</td>
<td>11.50</td>
</tr>
<tr>
<td>3</td>
<td>Instructions (8 Items 40 scores)</td>
<td>37</td>
<td>31.50</td>
</tr>
<tr>
<td>4</td>
<td>Teaching materials and support (3 Items 15 scores)</td>
<td>14</td>
<td>12.00</td>
</tr>
<tr>
<td>5</td>
<td>Measurement and Evaluation (4 Items 20 scores)</td>
<td>19</td>
<td>16.17</td>
</tr>
</tbody>
</table>

Total Scores: 99, 91, 83, 87, 94, 85, 89.84
Average (\( \bar{X} \)) = 89.84
Competency Level: Very good

5. The pre-service teachers’ feedback on ABL instructions with the 6-step DEECEE was in a high level (\( \bar{X} = 4.27, S.D = 0.68 \)), which is in accordance with the forth hypothesis. When considering in each aspect, it revealed that the instruction aspect gained the highest average (\( \bar{X} = 4.34, S.D = 0.63 \)), followed by measurement and evaluation (\( \bar{X} = 4.28, S.D = 0.66 \)), materials/games/activities (\( \bar{X} = 4.24, S.D = 0.70 \)), and benefits of the instructions (\( \bar{X} = 4.21, S.D = 0.72 \)), respectively. The details are as shown in Table 4.

Table 4 The pre-service teachers’ feedback on ABL instructions (DEECEE)

<table>
<thead>
<tr>
<th>No.</th>
<th>Particulars</th>
<th>Average (( \bar{X} ))</th>
<th>S.D</th>
<th>Competency Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Instructions</td>
<td>4.34</td>
<td>0.63</td>
<td>High</td>
</tr>
<tr>
<td>2</td>
<td>Materials/Activities</td>
<td>4.24</td>
<td>0.70</td>
<td>High</td>
</tr>
<tr>
<td>3</td>
<td>Measurement and Evaluation</td>
<td>4.28</td>
<td>0.66</td>
<td>High</td>
</tr>
<tr>
<td>4</td>
<td>Benefits of the instructions</td>
<td>4.21</td>
<td>0.72</td>
<td>High</td>
</tr>
</tbody>
</table>

VI. DISCUSSIONS
1. ABL instructions for promoting the creative instruction design ability of the pre-service teachers, Faculty of Education, Silpakorn University, consists of 6 steps, called DEECEE, which are: Step 1 Draw attention; Step 2 Experience learning; Step 3 Engage in activities; Step 4 Construct new knowledge; Step 5 Exchange knowledge; and Step 6 Evaluate outcomes. In every step of the instructions, the researchers has allowed the students practice and play a role in self-study and group work focusing on learning by doing, by giving opportunities for the students to build knowledge, interact, cooperate and learn in shared responsibility. In addition, the students are able to allocate duties and responsibilities whereas the researcher facilitate the learning management through games and fun activities, as well as competition with score-collating. Moreover, The students are allowed to create and design new interesting instructions, materials, creative pedagogies, methods of measurement and evaluation that are consistent with the learning outcomes that needed to be achieved for the learners, etc. Related to Ministry of Education [11] stated that ABL instructions is learning through various activities in order to achieve a learning purpose, to analytically think, to learn by doing, including to practice high-order thinking skill. Also, Festus (2013) mentioned that an ABL instruction is a process in which the learners are involved in learning process rather than receiving data from the lectures. It focuses on hands-on training and provides the learners to participate in the activities rather than only listening to the teacher. In addition, Gupta [10] mentioned that the ABL instruction is an educational innovation that helps learners gain experiences, thinking ability and data organization since the learners have the opportunity to practice solving problems by themselves.

2. The results of knowledge and understanding of the pre-service teachers of Art Education Program, enrolling in 462-202 Course - Learning Management and Classroom Management, using ABL instructions (DEECEE) with 4 units, after the instructions provided, 13 students gained the scores in a good level (21-25 points), accounted for 46.43 percent, which is in accordance with the first hypothesis. This is probably because Step 2, Experience learning, has given the students to learn about theories, principles, and concepts on various topics related to the contents. After that, the researcher organized Step 3, Engage in activities, by applying theoretical concepts into practice, thus enabling the students gained the scores in a good level. Related to Nathawut Sakunee [12], who stated that ABL instruction focuses on engaging the learners in learning process by practicing. The students would be enthusiastic and be able to learn, think and reflects what they have done. Moreover, they learn via activities that stimulate knowledge, ideas and contents, concepts that are important to their learning, by helping to encourage the learners to learn meaningfully, gain knowledge of contents, skills, work experiences that lead to understanding of the contents. Also, the students know their own learning mistakes.

3. The results of the pre-service teachers’ creative instruction design ability, in overall, the score was in a very good level, average score ( = 93.17), which is in accordance with the second hypothesis. This is probably because Step 5 Exchange knowledge of ABL instruction (DEECEE) has allowed each group present their own works on how the instructions, materials, equipment, and measurement and evaluation are designed. Each group also had opportunity to see, compare and reflect other groups’ work. In addition, according to Step 6, Evaluate outcomes, the researcher asked assessment questions to each group of the students regarding advantages and limitations of their works what would be done if the activities, approach, materials, and measurement and evaluation methods are modified, etc. Besides, the students have jointly considered their own works and other groups’ by giving and taking comments and suggestions with being open-minded in order to bring those comments to improve, decide and choose the most appropriate principles and concepts for better instructions. Therefore, the instruction design of each group was at a very good level. Related to McGrath and MacEwan [7], stated that ABL instruction is significant to the learners’ learning as it can encourage them to be active in learning process through the activities that the learner has practiced. So, it causes the learners to develop long-term knowledge and skills including ABL instruction that can also train the learners to express opinions with thoughtfulness. Furthermore, Limbu [9] mentioned that ABL instructions help the students in collaboration, increase creativity, build confidence and develop understanding through group activities. It also enhances learning pleasure between the students and classmates, including the students and teacher, and helps encourage the students who lack confidence on opinion expression and speaking to be able to express themselves through activities.

4. The results of the pre-service teachers’ instruction ability was in a very good level (89.84 points out of 110 points), which is in accordance with the third hypothesis. This is probably because the pre-service teachers have improved the instruction implemented in schools. According to the examples the researcher has presented and asked the questions in order to encourage the students create works. Evaluation is recommended by group members. In addition, to use the actual lesson plans, the students collaborate in a team and allocate the duties and roles in the instructions with systematic planning so that they can learn from practice. Corresponding with Festus [8] that specified the principles of ABL instructions that the learners learn and gain experience through hands-on training. Limbu [9] also said that ABL instructions helps the learners see surrounding things in everyday life that can be connected to the knowledge learned through hands-on training, touching and remembering. Moreover, the learners have practiced in collaboration. It helps to increase creativity, build confidence for the learners, and develop understanding through group activities in order to increase learning pleasure between the learners and peers, including the students and teacher, and it helps encourage the students who lack confidence on opinion expression and speaking to be able to express themselves through activities.
Recommendations
1. Recommendations for implementation
   1.1 To implement ABL instructions with DEECEE, the teacher should select suitable games or activities that are related to the contents of each learning unit.
   1.2 Each time playing games or doing activities, the teacher needs to clearly explain the rules, regulations, or scoring used in order to keep the games or activities proceeding fluently.
   1.3. Using “DEECEE” learning management, the teacher must inform learning purpose that the lesson plans would be implemented in schools and inform evaluation criteria since the first period.
2. Recommendations for further studies

2.1 There should be ABL instructions (DEECEE) to improve learning outcomes for other subjects.
2.2 There should be the studies using ABL instructions (DEECEE) to develop the students’ characteristic in other aspects such as analytical thinking, problem solving, critical thinking, teamwork, leadership and teacher traits, etc.

CONCLUSION
1. ABL instructions for promoting the creative instruction design ability of the pre-service teachers, Faculty of Education, Silpakorn University, consists of 6 steps, called DEECEE, which are: Step 1 Draw attention; Step 2 Experience learning; Step 3 Engage in activities; Step 4 Construct new knowledge; Step 5 Exchange knowledge; and Step 6 Evaluate outcomes.
2. The pre-service teachers’ knowledge and understanding of 4 units using ABL instructions after the experiment, the score of 13 students was in a good level (21-25 points), accounted for 46.43 percent.
3. The pre-service teachers’ ability to design ABL instructions, in overall, was in a very good level with average score ( = 93.17).
4. The pre-service teachers’ ability on ABL instructions was in a very good level (89.84 points out of 110 points).
5. The pre-service teachers’ feedback on ABL instructions with DEECEE was in a high level ( = 4.27, S.D = 0.68).

ACKNOWLEDGEMENT
We would like to express our great appreciation to the Center for Educational Innovation of Silpakorn University for funding this research. We would also like to thank the experts for their invaluable and constructive suggestions. My grateful thanks are also extended to the Head of the Department of Curriculum and Instruction and the Dean of the Faculty of Education, Silpakorn University. Without their support, this research would not have been completed.

REFERENCES


