THE DEVELOPMENT OF INSTRUCTIONAL USING CASE-BASED LEARNING THROUGH COLLABORATIVE LEARNING TO PROMOTE PRE-SERVICE TEACHERS' ABILITY TO LEARNING MANAGEMENT

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Abstract

The objectives of this study were to 1) develop an instruction using Case-Based Learning (CBL) and Collaborative Learning (CL) to promote the instructional design abilities of Pre-Service Teachers; 2) study the effectiveness of the instructions using conducted model by looking at: 2.1) comparison the learning outcomes of the Pre-Service teachers before and after studying, 2.2) study the learning outcomes of the Pre-Service Teachers' instruction, 2.3) study the instructional design ability of the Pre-Service teachers and 2.4) feedback of Pre-Service teachers towards the model. The samples were 25 undergraduate Pre-Service teachers at the Faculty of Education, Silpakorn University in Thailand. The samples were purposively selected. The instruments included: 1) instruction using CBL and CL, 2) a comprehensive test; 3) assessment on instructional design abilities; 4) assessment for delivering instructions, and 5) survey on students' feedback. The study utilized statistics for comparisons including mean, standard deviation, and T-score. The results were as follows: 1) The instruction using CBL and CL for promoting the instructional design abilities of Pre-Service Teachers applies to a 6-step approach called DAISI. The steps are: First: define a situation or event. Second: analyze the problems of the situation. Third: identify alternative solutions. Fourth: search results. Fifth: share knowledge. Sixth: implement the results. 2) The effectiveness of conducted model The Post-Research Stage were: 2.1) The learning outcomes of Pre-Service Teachers after using model were

significantly 0.5 higher than before their attendance. 2.2) The overall learning outcomes of Pre-Service Teachers were in a "good" level ($\bar{x}$ = 23.92, SD = 1.89). The Pre-Service Teachers' ability to design instructions using model were in a "very good" level ($\bar{x}$ = 86.66). 2.3) The Pre-Service Teachers' ability to deliver instructions (field experience) using model was in "good" level (score 76/100). 2.4) Pre-Service Teachers' satisfaction towards the model was high ($\bar{x}$ = 4.28, SD = 0.71).

Keywords: Case-Based Learning (CBL); Collaborative Learning (CL); instructional abilities; Pre-Service Teachers

Background

Major changes in life skills across all classes in Thailand during the 21st century (Hajkowicz et al., 2012; Canton, 2006; Friedman and Friedman, 1998; Panich, 2012) have been underpinned by seven megatrends in teacher roles, student's learning approaches, instructions and development in learning sources. Accordingly, teachers have had to update their learning and professional development because of profound socio-economic and technological changes and, in particular, the rapid flow of information associated with profound socio-economic and technical change.

Wider societal and cultural transformations – together with greater personal, health and financial expectations and ambitions – have inevitably impacted on the education system. The advancement of technologies has affected the way we learn or seek knowledge. In the past, students were traditionally taught to learn; in contrast, contemporary approaches emphasize independent learning – not the passive reception of 'knowledge'. In short, teachers must now respond to changes to operate and instruct efficiently within their educational institutes varying from school, educational service area, and Ministry of Education (Sithsungnoen, 2015).

This is a global ambition exemplified by The Florida Education Standards Commission which concluded that teachers in the 21st century must have the capability to use suitable teaching techniques and strategies, understanding of the context, a variety of teaching approaches, and the ability to plan lessons and deliver effectively. (National Institute for Development of Teachers, Faculty Staff and Educational Personnel (NIDTEP), 2005)

The Faculty of Education at Silpakorn University in Thailand shapes Pre-Service Teachers to be professional teachers who embrace the latest pedagogic and learning strategies.

They are trained to have a clear understanding of professional obligations and expectations based on the teacher's statement.

Regardless of contexts and acquired knowledge, teachers must now incorporate differentiated teaching approaches based on the Code of Ethics. It is expected that they should display knowledge of differentiated teaching approaches on subjects, teachers' manners, and the Code of Ethics of Teaching

Profession (Sithsungnoen, 2015). Crucially, learning and classroom management is now based on instructional design: thus, emphasis is placed on instructional design, learning material design, uses of learning sources, homework design, assignment design, and learning measurement and evaluation. In short, an efficient teacher should be proactive, responsive, and supportive. Well-designed instructions and positive teacher classroom psychology create optimum learning environments which result in raising student achievements. Moreover, by empowering students within a positive learning environment, learning becomes more of an 'enjoyment' rather than a discipline. The "Teacher", then, sets the tone within the learning environment – their personalities, attitudes, teaching behaviors, classroom management techniques, and interactions in the classroom therefore are not only crucial components of student exam success, but also affect student 'enjoyment' of the learning experience.

The promotion of effective learning processes depends heavily on suitable principles and approaches used in delivering instructions. Laowreandee (2005) argues that strategies for teaching thinking skills involve: CATS (Classroom Assessment Techniques), Cooperative Learning Strategies, Problem Based Learning, Independent Investigation Learning, and CBL. The ways to encourage development and problem-solving skills, studying in groups, independent study, and presenting knowledge are through CBL which links to students, teachers, classrooms, and schools. Similarly, Kitroongrueng (2010) suggested that CBL is another teaching approach which can encourage students to analyze social and physical classroom. The situations used in this method can be stories or real-life events. The objective of this approach is to allow students to understand and innovate ideas and thoughts. Teachers can adapt this method inductively or deductively depending on their objectives. In the inductive approach, teachers will give a situation for students to analyze issues, ideas, and solutions. However, if it is deductive, teachers will explain principles and rules, followed by giving example cases for students to reinforce a better understanding. The research results of Hays (2008) found that the CBL method was useful for role-playing and problem solving by emphasizing teamwork and research skills.

The CL approach allows students to work in a team to achieve mutual objectives. Nevertheless, teachers are also required to apply teaching strategies to have students generate what they have learned from activities into knowledge (Dechakup, 2001). Sinlarat (2014) also argues that CL focuses more on mutual interests rather than the level of competency. Each team member has a specific role and work collaboratively on researching, operating, and supporting each other. This learning underlines the acceptance of each team member's role and comfort in exchanging ideas.

Gokhale (1995) suggests that CL empowers small team working skills with mutual objectives. Students are responsible for each other to achieve the outcomes. Thus, teachers should use suitable teaching techniques. Students should also be prepared to participate by assuming individual responsibility for the overall success of team's assignment. When the team achieves the objectives, every team member will be able to learn effectively as part of a wider team. Considering the importance of CBL and CL, it is clear that appropriate use of instruction can develop Pre-Service Teachers' instructional design abilities effectively.

Objectives

1. To develop an instruction using CBL and CL to promote instructional design abilities of Pre-Service Teachers.

2. To study the effectiveness of the instructions using CBL and CL by looking at:

   2.1 The learning outcomes of the Pre-Service Teachers enrolled in Methods of Teaching Subject before and after studying.

   2.2 The learning outcomes of the Pre-Service Teachers' instruction in Methods of Teaching Subject.

   2.3 The instructional design ability of the Pre-Service Teachers enrolled in Methods of Teaching Subject.

   2.4 The feedback of undergraduate Pre-Service Teachers enrolled in Methods of Teaching Subject, where normal instructional approach is used in comparison to the instructions using CBL and CL.

Delimitation of the Study

Samples

Samples were purposively selected. They are 25 undergraduate Pre-Service Teachers at the Faculty of Education, Silpakorn University. They were studying the Methods of Teaching Subject in the second semester of the academic year 2017.

Variables

Independent Variable is the instruction using CBL and CL.

Dependent Variables are: 1) Learning outcomes of Pre-Service Teachers and 2) The ability to design instructions of Pre-Service Teachers.

Contents

There are 4 units: 1) Techniques and Science of Instructional Management 2) Material Creation and Innovation Development in Instructions 3) Measurement and Evaluation 4) Classroom Management.

Duration

This research was conducted in the second semester of academic year 2017 (January - June 2018) when 4 units of instructions for 9 weeks. The lesson plans were actually used in an educational institute for 2 weeks.

Research Assumptions

1. There is no random selection.
2. It is true experimental research.
3. The classroom is selected purposively.

Research Methodology

This study uses the Pre-Experimental Research method and One-Group Pretest-Posttest Design (Nillapun, 2012).

Pretest	Experiment	Posttest
T_1	X	T_2

Figure 1: Research Design (One-Group Pretest-Posttest Design)

Research Instruments

1. Instruction using CBL and CL.
2. 30-item comprehensive test on the 4 units of the instructions
3. 20-items of 5-point scale assessment on the instructional design abilities
4. 5-point scale assessment on 5 mandatory skills for instructions
5. 5-point scale survey on students' feedback towards the instructions consisted of 4 sections.

Creation, Validity, and Reliability of the Instruments

1. Instructions using CBL and CL

1.1. The researcher studied and analyzed documents and researches about the instruction using CBL and CL for undergraduate students.

1.2. The researcher analyzed the methods of teaching subject, which uses a regular instructional approach, for undergraduate students at the Faculty of Education, Silpakorn University.

1.3. The instruction using CBL and CL was developed. There is a 6-step approach called DAISI;

(1) Defining a situation or event: To have students present a case study in group;

(2) Analyzing the problem of a situation or event: To have students work collaboratively to analyze the case;

(3) Identifying alternative solutions is to have students brainstorm the solutions;

(4) Searching for results: To have students decide on the best solution;

(5) Sharing knowledge: To have students present the solution to others;

(6) Implementing the results: To have students apply the solution to different cases.

1.4. The instruction using CBL and CL is submitted to 3 experts in instructions and method, teaching, and measurement and evaluation to audit its quality and validity. The Likert's Five Rating Scale survey was used to collect feedback towards instructions using CBL and CL at the highest, high, fair, low,

and lowest level (Nillapun, 2012). The feedback results were interpreted according to the concept of Best (1986: 195).

1.5. The researcher modified and improved the instruction using CBL and CL according to the experts' recommendation.

1.6. The researcher used the updated version of the instructions using CBL and CL with the samples.

2. Comprehensive test on the instructions

2.1. The researcher studied and analyzed documents and research about the test measurement and evaluation.

2.2. The researcher created a comprehensive test for the 4 units of instructions which are: 1) 12 items for the techniques and science of instructional management unit; 2) 5 items for the material creation and innovation development in instructions unit, 3) 8 items for the measurement and evaluation unit, and 4) 2 items for the classroom management unit. There are 30 items in total. The test is an objective assessment with 4 choices. One point is for a correct answer and zero point for an incorrect answer. The average scale of the understanding level in the instructional management varies from very good, good, fair, poor, and improvement needed.

2.3. The researcher submitted the 4 units of instructions' comprehensive test to three experts to examine and find the Index of Item Objective Congruence (IOC) of the instrument. The IOC results are between 0.66-1.00. Therefore, the comprehensive test for the 4 units of instructions reflects the objectives.

2.4. The comprehensive test was tried out with 23 third-year students of the academic year 2017 to verify the instrument quality.

2.5. The results were analyzed item by item to verify the difficulty of the objective test. The proportion of the students who chose correct answers per the total number of the students taking the test were measured by 0.20-0.80. The discrimination index of the objective test distinguished the students' high and low proficiency levels as of the value of 0.20 or higher.

2.6. Reliabilty testing verifies measurement consistency. The researcher examined the reliability of the qualified objective test by using Kuder-Richardson's formula called KR-20. The reliability should be at least

0.75. The researcher amended and improved the comprehensive test as recommended.

2.7. The researcher used the test for ratio and percentage subject as a tool with the samples.

3. Assessment on the instructional design abilities

3.1. The researcher studied and analyzed documents and researches related to instructions, instructional design, and lesson planning techniques.

3.2. The researcher creates 20 items of the 5-point scale assessment about the instructional design abilities. The assessment evaluation uses the Likert's 5 Rating Scale varying from highest, high, fair, low, and lowest level (Nillapun, 2012).

3.3. The instructional design abilities' assessment was submitted to 3 experts to verify the content validity, language used, and measurement and evaluation. The Index of Objective Congruence (IOC) value must be ≥ 0.50.

3.4. The researcher used the updated assessment with the samples.

4. Assessment on the ability to deliver instructions

4.1 Papers or research related to instructions and ability to deliver instructions were studied and analyzed.

4.2 The findings of papers and research in Thailand and abroad about outlining teachers' abilities to instruct were summarized.

4.3 20 items of a 5-point scale assessment on 5 mandatory skills for delivering instructions were created. They included teaching skill, content skills, instructional skills, learning material and resources skills, and measurement and evaluation skills. The assessment scales are very good, good, fair, poor, and need improvement.

5. Survey on students' feedback towards the instructions

5.1 The format and method to create a survey on students' feedback towards the instructions using CBL and Collaborative Learning were studied;

5.2 A survey on students' feedback towards the instructions using CBL and Collaborative Learning was created. The questionnaire contains 2 sections:

Section 1: Survey on students towards the instructions in Methods of Teaching Subject where 4 units of normal teaching approaches were used. There are also questions regarding material creation, innovation development in instructions, measurement and evaluation, and classroom management. The survey asked: 1) 5 questions about instructions using CBL and Collaborative Learning; 2) 5 questions about materials and case study; 3) 5 questions about measurement and evaluation; and 4) 5 questions about the benefits of taking these courses, which will make 20 questions in total. Likert's Five Rating Scales were used for this survey, in which the scales vary from highest, high, fair, low, and lowest (Nillapun, 2012).

Section 2: One open-ended question on students' feedback towards the instructions to let them suggest any other comments on the instructions using CBL and Collaborative Learning.

5.3 Present the feedback survey to 3 experts to verify the accuracy of its contents and take suggestions from the experts to find the Index of Item Objective Congruence (IOC) of the instrument by choosing the questions that has IOC value of ≥ 0.50 because this means the survey is valid.

5.4 Use this feedback survey as a research instrument.

The Conduction of Research

The study was divided into 4 stages:

1. The Pre-Research Stage is the stage where the researcher prepared the following:

1.1 The researcher explained the steps of the 4 units of instruction using CBL and Collaborative Learning, the measurement and evaluation, and pilot instructions. Students were allowed to participate in every step.

1.2 Students did the 30-item comprehensive test on the 4 units of the instructions. The same test was used in both pretest and posttest.

2. The Research Stage is where the researcher gave instruction using CBL and Collaborative Learning, and designed instruments. Details are as follow:

2.1 The 4 units of instructions took 7 weeks in total, 2 hours per day.

2.2 The content was disseminated using the DAISI steps. The content was in the Methods of Teaching Subject where the regular instructional approach was used. Duration of the 4 units of instructions was 3 weeks for the

techniques and science of instructional management unit, 1 week for the material creation and innovation development in instructions unit, 2 weeks for the measurement and evaluation unit, and the other week for the classroom management unit.

2.3 Students worked in a separated group to learn activities and practice instructional design.

2.4 The researcher evaluated each group's instructional design.

2.5 The researcher delivered instructions.

3. The Implementation of the Instructions at an Educational Institute

3.1 The research gave assignments for students to design instructions (field experience) containing local content that could be used at school. The instructions would be delivered for the total of 6 classes, two classes of each level of elementary 1-3 at Tessaban 2 Watsaneha (Samakphonphadung) School.

3.2 The researcher made contact to Tessaban 2 Watsaneha (Samakphonphadung) School, which is one of the schools that participates in teaching development programs and offered to send Pre-Service Teachers to deliver their designed instructions at the school during May-June 2018. The researcher also requested the teachers of each elementary class to evaluate the Pre- Service Teachers' ability to instruct.

4. The Post-Research Stage enabled the researcher to authorize students to undertake the 30-item comprehensive test on the 4 units of the instructions. The same test in the pretest was also used for this posttest. Students completed the survey on students' feedback towards the instructions. The results of the feedback were then calculated statistically.

Research Results

1. The instruction using CBL and CL to promote the instructional design abilities of Pre- Service Teachers in the Faculty of Education at Silpakorn University was employed by the 6-step approach called DAISI.

Step 1: Defining a situation or event

Teachers divided students into small groups of 4-5 and presented a case study of a situational or real-life event from newspapers, online social media, or websites. The content can be either positive or negative.

Step 2: Analyzing problems of the situation or event

Team members analyzed the case collaboratively. The big picture would encourage more research from various learning sources using information technology. The teacher advised students to use the 5W1H (What Who When Where Why How) technique to discuss the causes of the problems.

Step 3: Identifying alternative solutions

Team members brainstormed options to study on different given cases and finalized the best solution. This must be relevant to the designated principles, concepts, and theory.

Step 4: Searching for results

Team members used the agreed option to search for results.

Step 5: Sharing

Students checked their answers or their final solutions before presenting them to class. The teacher and Pre-Service Teachers discussed the answers.

Step 6: Implementing

Each team could try applying the solutions of another team for their cases.

2. The results of the DAISI 6-step implementation showed that:

2.1 The learning outcomes of the undergraduate students in the Early Childhood Education Program in the Methods of Teaching Subject, where regular instructional approach was used, was significantly higher (0.5) after attending the instruction using CBL and CL.

Table 1: Comparing Learning Outcomes of Pre-Service Teachers before and after Studying

Test	Number of Students	Average ($\bar{x}$)	Standard deviation (SD)	T-Score
30	25	15.48	1.80	39.45*
30	25	23.92	1.89	

2.2 The learning outcomes of the undergraduate students in the Early Childhood Education Program in the Methods of Teaching Subject, where regular instructional approach was used, was in a good level ($\bar{x}$ = 23.92, S.D 1.89), see Table 2.

Table 2: Learning Outcomes of Pre-Service Teachers' Instructions

Score out of 30	Number of Students	Total	Outcomes
27	2	54	Very good
26	3	78	Very good
25	6	150	Good
24	4	96	Good
23	4	92	Good
22	3	66	Good
21	2	42	Good
20	1	20	Fair
Total	25	598	
Average ($\bar{x}$)		23.92	**Good**
Standard Deviation (SD)		1.89	

2.3 The instructional design abilities of the undergraduate students in the Early Childhood Education Program in the Methods of Teaching Subject, where the CBL and CL instruction is applied, was in a very good level ($\bar{x}$ = 86.66), see Table 3.

Table 3: Pre-Service Teachers' Design Instruction Abilities

Evaluation items	**Level of ability**					
	Group no.					
	1	**2**	**3**	**4**	**5**	**6**
Instructional design	86	89	90	84	89	82
Quality level	Very good	Very good	Very good	Good	Very good	Good
Average ($\bar{x}$)	**86.66**					
Quality level	**Very good**					

2.4 The ability to deliver instruction (field experience) of undergraduate students in Early Childhood Education Program taking Methods of Teaching Subject where CBL and CL approaches applied was at a good level (score 76 out of 100). See details in Table 4.

Table 4: The Ability to Deliver Instructions (Field Experience) of Pre-Service Teachers

Skills/Item no.	Evaluation items	Level of ability					
		Group no.					
		1	**2**	**3**	**4**	**5**	**6**
Total score		76	73	75	79	77	76
Quality level		Good	Fair	Fair	Good	Good	Good
Average ($\bar{x}$)				76			
Quality level				Good			

2.5 Feedback of undergraduate students in Early Childhood Education Program taking Methods of Teaching Subject where CBL and CL approaches applied was high ($\bar{x}$ = 4.28, SD = 0.71).

Discussion and Conclusion

Results of the development of instructions using CBL and CL to promote the instructional design abilities of Pre-Service Teachers in the Faculty of Education at Silpakorn University can be concluded as follow:

1. The development of instructions using CBL and CL to promote the instructional design abilities of Pre-Service Teachers in the Faculty of Education at Silpakorn University is the 6-step approach called DAISI. This term was synthesized from core principles of CBL and CL by several scholars. A CBL approach offers the opportunity to learn new knowledge through implementation and discussion. Since it is an integrated education, students are responsible for gathering information, analyzing the main idea, and segmenting unnecessary details. As discussed by Harman et al. (2015), CBL allows students to learn from situational problems. The general purpose of a case study for this

professional approach is to empower students' cognition from what they learn in the classroom. This approach enables students to find solutions to problems of real-world scenarios through Collaborative Learning. It allows students with different levels of proficiency to work together as a team and take responsibility for their roles to achieve shared objectives (Jaitieng, 2007). Slavin (1995) also argues that this approach lets students work in small groups effectively, usually in a group of four. Each group member has a different level of proficiency but they are responsible for a given assignment and supporting other students in the same group. This allows them to work collaboratively to achieve the same goal.

2. The effectiveness of the instructions using CBL and CL to promote the ability of Pre-Service Teachers are discussed below:

2.1 The learning outcomes of the Pre-Service Teachers after implementing instructions using CBL and CL were significantly (0.5) higher than before their use. The score was at a good level ($\bar{x}$ = 23.92, SD = 1.89). This might be because the instruction using DAISI has responded to the students' learning needs. The instruction also allowed students to use technology to research for information, exchange the findings with other students, verify, and record the information. Bergmann and Sams (2012) argue that the implementation of new technologies in a classroom can improve the learning environment where students study their assignments. For example, students might study from videos at home before the class for preparation. Accordingly, they would have more time to engage in class activities, exchange knowledge with classmates, and encourage more note-taking and communication skills. Other scholars such as Easton (1992), Khemmani (2012), Laowreandee et al. (2017), and Sithsungnoen (2018) also suggest that this instructional approach facilitates independent learning and self-reflection. Crucially, it also encourages students to think critically and learn from others which can widen their educational visions

2.2 The Pre-Service Teachers' instructional design abilities using CBL and CL were at a "very good" level ($\bar{x}$ = 86.66). This might be from the knowledge learned from the class's Facebook group where the teacher regularly posts news, example cases, and discussion topics. The contents shared by the researcher are mixed with the positive and negative sides of teachers. They are from different learning sources available online such as published materials, and

teacher television. The contents were about techniques and science of instructional management, material creation and innovation development in instructions, measurement and evaluation, and classroom management. The test is an objective assessment with 4 choices. One point is for the correct answer and zero point is for an incorrect answer.

These posts let students learn from case studies of good teachers who instruct efficiently. Mellish and Brink (1990) also propose that CBL allows students to understand and prepare the main ideas' analysis of a given case study enabling them to brainstorm with other students and show their teamwork. Accordingly, they could consider the controversy among members. Williams (2004) argues that CBL is the process of exchanging knowledge on the verification of the hypothesis. At this stage, they can present their ideas to other students in different groups who can adopt the ideas that most of them agreed on.

2.3 The Pre-Service Teachers' ability to deliver instructions (field experience) using Case Based Learning and CL was at a good level (score 76 out of 100). This could be due to the students have learned from case studies of early childhood teachers from teacher television. This may have reflected early experiences with childhood teacher experiences.

Their instruction was delivered effectively whilst creating a fun experience for early childhood students. The researcher observed instruction delivered by Pre-Service Teachers who adopted the techniques that they have learned from early childhood teachers. The contents used for delivering field experience were also similar to what they encounter in their daily life which could help create fun atmosphere. By utilizing life experiences, teachers were able to reinforce and recreate positive and enjoyable experiences into their delivery of pedagogic, classroom content. Johnson and Johnson (1994) mentioned about CL that every group member could benefit from working together to achieve the same goal, sharing materials and information. Each of them has (a) role and responsibility to support each other in order to achieve their objectives with confidence.

2.4 Feedback of undergraduate students in Early Childhood Education Program taking Methods of Teaching Subject where CBL and CL approaches and DAISI 6 Steps applied was high ($\bar{x}$ = 4.28, SD = 0.71). This

may have been the result of the students' learning through several case studies and sharing of experiences among group members. Khemmani (2012), Laowreandee et al. (2017), and Sithsungnoen, (2018) have illuminated and emphasized the value of CBL as it enables students to encounter and solve problems without facing actual problems. This allows students to think critically and to meaningfully engage with others, a holistic experience which, as this study has explained, could widen student learning and teaching capabilities. By encouraging teamwork and knowledge exchange, the student pedagogic experience can be measurably improved.

Overall, the strengths of the model enhance higher-order thinking skills as 'power questions' are continually used during the teaching and learning process. The student experience is substantially enhanced by exposure to a wide variety of contemporary sources of technologically informed information which promotes peer discussions around best practice. Students can also gain more ideas from various sources of information, for example, from positive and negative cases whilst developing alternative choices from peer discussions.

Model limitations center on updating resources and peer discussions have to include an awareness of contemporary resources and their validity. Reflection activities therefore, must be continuous so that up to date information can be exchanged.

Recommendations

Recommendations for Improving Program Implementation

1. The implementation of the "DAISI 6-Step" requires a well-selected case study from various sources of information such as online social media, news, publications, or teacher television. The contents can be either positive or negative depending on the context of instructions. Therefore, teachers should have the research abilities to acquire information from various sources. Accordingly, students can prepare themselves before class from the media or contents provided.

2. While applying "DAISI 6-Step", teachers should share the conditions, planned learning objectives, and assessment with the students so that they can achieve the learning objectives of the course.

Recommendations for Future Research Directions

1. There should be more research on CBL and CL for other subjects.

2. There should be more research on CBL and CL to promote development on other skills of students such as analytical skills, problem-solving skills, or critical thinking skills.

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