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ENHANCING PRE-SERVICE COMPUTER TEACHERS' ONLINE TEACHING ABILITY THROUGH BLENDED DISTANCE LEARNING WITH COMPETENCY-BASED CLASSROOM SIMULATION ACTIVITIES

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Abstract

This research aims to 1) study remote learning activities with competency-simulated classroom to promote the online teaching abilities of computer teacher students, 2) assess the suitability of learning activities, and 3) find out the effectiveness of learning activities according to the criteria of 80/80. Participants were 24 third-year students from one university in Thailand. Research instruments include remote learning activities with competency-simulated classroom, achievement test, and online teaching proficiency assessments, statistics in data analysis include percentage, mean, standard deviation, and t-test. The results showed that remote learning activities with competency-simulated classroom, consisting of 3 preparation stage, teaching stage, and evaluation stage. The appropriate evaluation of learning activities is at the highest level, and the effectiveness of learning activities improved with efficiency is 80.85/81.15 which is met the requirement of criteria.

Keywords: Blended distance learning, Classroom simulation activities, Online teaching ability, Pre-service computer teachers

1. Introduction

Ordinary National Basic Educational Test (O-NET) in science and mathematics showed that the average scores of Thai students were still below the benchmark and answered. Thai students are still below average. Thailand needs to improve the quality of education by modifying learning from the previous focus on subject content to teaching to improve student performance and intelligence, rather than focusing solely on the development of knowledge by the Ministry of Education. Therefore, the urgent need to change is to develop teachers to be able to provide performance base teaching (Institute for the Promotion of Teaching Science and Technology, Ministry of Education, 2021), as well as educational institutions that produce teachers should strive to improve teacher performance.

The World Health Organization has declared a public health emergency in the event of a coronavirus pandemic in 2019. As a result, educational institutions are unable to provide regular teaching and learning opportunities. As a result, online instruction is critical today, allowing the Office of the Basic Education Commission to steer the growth of the Ministry of Education's platform. to communicate online. For secondary school teachers conduct training

to develop teachers' potential in online teaching using online tools (Basic Education Committee, 2020). Online teaching and learning of computer disciplines, which has to adapt learning activities to empower students to have online teaching capabilities.

With scenario-based learning management, online technologies handle remote learning and online teaching practice. It is a method of teaching students to play in circumstances where the roles, data, and rules of play mimic reality and interact with the objects in the situation, utilizing data that is comparable to that of reality. In making decisions and solving problems, the decisions affect players in the same way that occur in real-world situations, it is an opportunity to practice a number of different process skills, such as the process of interacting with others (Dostal et.al., 2017a; Dostal et.al., 2017b). Communication processes, decision-making processes are based on the concept of combining a variety of teaching methods.

The combination of learning activities will encourage students to have a wide range of performances. It is a remote learning mix of performance base classroom simulation activities. To provide computer teacher students with online teaching experience. When going out to practice teaching in schools, students have confidence in teaching and can provide effective teaching (Kumsawai et.al., 2022; Abubakar & Mohammed, 2022). From the importance and origin of the above-mentioned problems. The researchers then conducted research on the study and design of remote learning activities, combining performance base classroom simulation activities to promote the online teaching abilities of computer teacher students, which would be useful to bring the learning activities into real life.

2. Research Objectives

1. To study and design remote learning activities with competency-simulated classroom for computer teacher students.

2. To assess the suitability of remote learning activities with competency-simulated classroom for computer teacher students.

3. To find out the effectiveness of remote learning activities with competency-simulated classroom for computer teacher students according to the criteria 80/80.

3. Research Framework

This research applied the concept of teacher development to be able to provide competency based teaching (Institute for the Promotion of Teaching Science and Technology, Ministry of Education, 2021), guidelines for online teaching in the event of a coronavirus outbreak 2019 (Ministry of Higher Education, Science, Research and Innovation, 2020), a combination of various teaching methods, Simulation Learning (Khammani, 2009) and Distance Learning through Microsoft Teams (Basic Education Committee, 2020) with Competency-Based Classroom Simulation Activities to promote the online teaching. The research diagram is organized as follows:

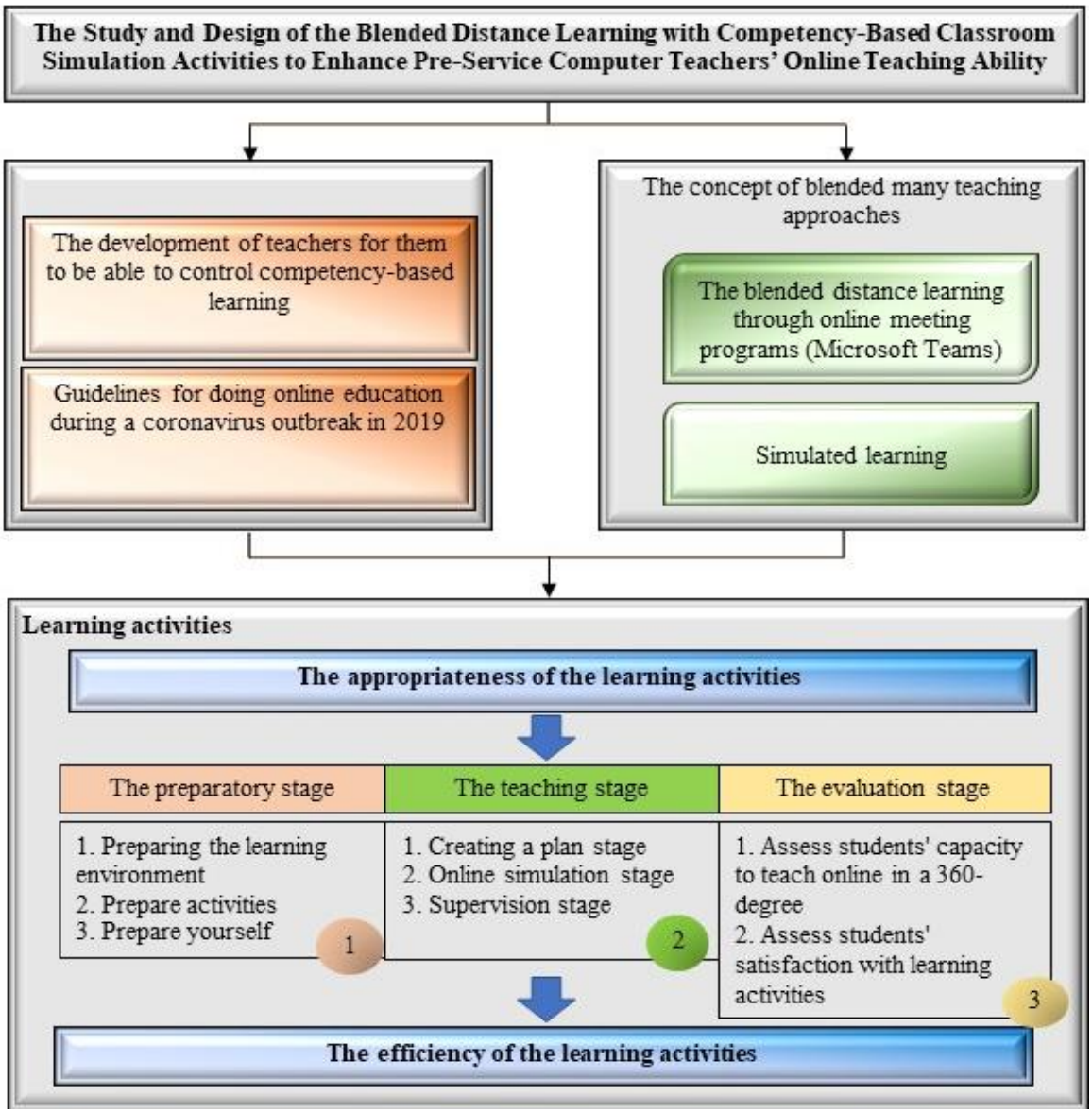

Figure 1. Research Framework

4. Research methodology

4.1 Population and samples

The target group for evaluating the suitability of learning activities is 5 educational experts, selecting specifically defined qualifications as follows: learning management experts and content experts with at least 5 years of experience in teaching and learning. The population of the research includes students in computer science. Faculty of Education and Innovation, Kalasin University, 24 junior students, and 18 of senior students with competency-simulated classroom, online technologies handle remote learning and online teaching practice.

4.2Research tools

- The assessment of the suitability of remote learning activities with competency-simulated classroom for computer teacher students as a 5-level rating scale of 10 subjects that have been assessed for instrument quality (IOC) by qualified 3

persons. The consistency index is 0.67-1.00 and the whole conviction is obtained by determining the alpha coefficient of Cronbach, 0.84.

- The test measures academic achievement as a 4-choice multiple choice type of 40 questions, and the researchers presented the academic achievement test to a computer science teaching luminary. 3 persons check content compliance and language understanding. The IOC value is between 0.67-1.00.
- Online teaching proficiency assessment is a 5-level rating scale of 4-sided, totaling 20. Then, the assessment was conducted with 25 teacher students and obtained the entire conviction by determining the alpha coefficient of Cronbach, equal to 0.86.
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4.3 Data Collection

- Assessment of the suitability of learning activities. The researchers also created an online assessment through Google Form and take out data from expert evaluations, calculate and evaluate them in Google spreadsheets.
- Finding the effectiveness of learning activities, the researcher took quality tools to collect data with the sample and conducted learning management through remote learning activities with competency-simulated classroom for computer teacher students, and then evaluating 360-degree omnidirectional teaching abilities based on self-assessment.
- When completing all activities, then the researcher collected data, evaluated the effectiveness of learning activities, and reported the findings.

4.4 Data Analysis

Basic statistics include percentage, mean, and standard deviation. Statistics used to analyze activity performance test data include determining the developmental testing (E_1/E_2) which setting a performance evaluation threshold of 80/80.

5. Research Results

1. The blended distance learning with competency-based classroom simulation activities in computer learning management for basic education through the Microsoft Teams program. Students learned the content according to the course description, and the objectives of the course as follows:

Table 1. *The blended distance learning with competency-based classroom simulation activities*

Week	Remote learning activities with competency-simulated classroom
1-2	The preparation stage consists of 3 preparations of learning: 1. Prepare learning environment in Microsoft Teams, it is designed according to the classroom simulation activity phase including learning sheets, instructional materials, downloadable documents, infographic media. Researcher created a poll to comment, for all students and then added into communicative channel to group activities. Researcher gave tasks in the assignments and 5. Use the insights app to view statistics on teaching activities. 2. Prepare activities Prepare online classroom scenarios and learning exchange activities. 3. Prepare yourself with the following activities: 3.1 Online orientation Course Practices Introducing courses and classroom simulation activities

Week	Remote learning activities with competency-simulated classroom
	3.2 Introduce remote learning and try Microsoft teams tools 3.3 Instructors share their teaching experience online, make students aware of the importance, problems, and give examples of solutions.
	Online Pre-School Test
3-5	The teaching stage consists of 3 steps: 1. Step S.E.C. created a plan, a learning and practice, writing a performance base learning plan. 1.1 Lecturers educate and give examples via video call, share content Present media and discuss knowledge summaries. 1.2 Practice, assignment instructor, introduction of sample tasks by sharing files. Edit collaborative files in real-time learning 1.3 Students submit a link to the work in the subject group and vote for the best performance of each event.
6-15	2. Steps Tue Online Organize online classroom simulation activities through Microsoft teams in 5 steps: Step 1: Prepare scenarios: Teachers and students share an online classroom scenario. To teach the use of web-based teaching and learning. Step 2: Presentation of scenarios: Teachers tell the reasons, objectives and results of the activity, as well as set the teaching conditions. as follows 2.1 30-minute teaching period 2.2 Let students choose content of interest, and practice using tools in Microsoft Teams to teach. 2.3 Enable students to create digital media for teaching and learning environments in Microsoft Teams. 2.4 360-degree holistic teaching assessment based on self-assessment Teacher evaluations and assessments from classmates and compare the average of each section. And summarize the teaching results of each student. Step 3: Assign a role by having students take on the role of "secondary computer teacher" and classmates to take on the role of "student". Step 4: Play in a scenario: 4.1 Students and professors participate in the scenario through Microsoft Teams. Record videos during class and share files, edit files together in real time. 4.2 Teachers observe students' teaching habits and take notes, provide advice as needed, and solve problems that may arise. Step 5 Discussion: After the teaching simulation, students jointly review the events during the online classroom simulation and discuss the conclusions reflecting the teaching results.
16	3. Step Inservice is a suggestive in-service after observing teaching and listening to the student's teaching results, there are 3 steps: 3.1 Pre-coaching steps before making recommendations Instructors and students make mutual agreements on issues or focuses that they want to guide together. 3.2 Coaching stage consists of three sub-steps : 3.2.1 Original cost study Instructors try to understand how they think, how they teach, and the consequences of teaching them to what extent they are. To provide information on how to build to suit each student. 3.2.2 Students think back and reflect on the teaching results, helping them to review and ponder how they have used their cognition from studying to practice.

Week	Remote learning activities with competency-simulated classroom
	What obstacles do you have, and the instructor provokes it with two main questions: "What's doing well, what better if....." 3.2.3 Further steps to the experience, the instructor takes the information from the teaching observation in 2 points: 1. If the student has some misunderstandings or problems, it needs to be corrected. 2. If students have a good understanding of teaching principles but lack experience in teaching design, it is necessary to increase knowledge, share experience. 3.3 Post-Coaching is step in which instructors give students the opportunity to summarize the results in order to achieve important principles to further adjust their teaching.
17	Evaluation stages include: 1. Evaluate students' online teaching abilities in a 360-degree surround way based on self-assessment. Teacher assessments and assessments from classmates. 2. Assess satisfaction with learning activities.
18	Final exams are online post-study tests.

From the Table 1 showed that the blended distance learning with competency-based classroom simulation activities in the subject of computer learning management for basic education consists of 3 preparation stages (preparing the learning environment, preparing activities, preparing the mind), teaching stage (planning, online teaching, supervision) and evaluation stage (360-degree all-round assessment, satisfaction assessment). The online stage will be designed based on 5 steps of the blended distance learning with competency-based classroom simulation activities, including; 1) preparation, 2) scenario presentation, 3) role selection, 4) playback in a scenario, and 5) discussions.

2. The evaluation of the suitability of learning activities by 5 experts is at the highest level)$\overline{X}$ = 4.84, S.D.= 0.37).

Table 2. *The results of learning activity suitability assessment*

Assessment item	$\bar{x}$	S.D.	Interpretation
1. The content in the learning activity corresponds to the course description.	4.80	0.45	Highest
2. The learning management is planned to develop learners.	4.80	0.45	Highest
3. The learning activities enable teaching to achieve the aims of the course	5.00	0.00	Highest
4. The learning activities encourage students to have the ability to teach online.	4.80	0.45	Highest
5. Design activities are consistent with competency-based classroom simulation activities.	5.00	0.00	Highest
6. The learning activities are diverse.	4.80	0.45	Highest
7. The activities focus on students working on their own.	5.00	0.00	Highest
8. It is timed appropriately and can be put into practice.	4.80	0.45	Highest

Assessment item	$\bar{x}$	S.D.	Interpretation
9. The distance learning activities through Microsoft Teams are clear.	4.80	0.45	Highest
10. The appropriateness of the combination of distance learning management through Microsoft Teams and competency-based classroom simulation activities.	4.60	0.55	Highest
Average	4.84	0.37	Highest

From the Table 2 showed that the blended distance learning with competency-based classroom simulation activities in the subject of computer learning management for basic education, it is at the highest level)$\bar{X}$= 4.84, S.D.= 0.37).

3. The efficiency of developed learning activities efficiency equals 80.85/81.15, according to defined criteria of 80/80.

Table 3. *The results of learning activity efficiency*

Testing	Number of students	Full score	Total score	Average score	Efficiency
During Class (E1)	24	40	776	32.34	80.85
Post-test (E2)	24	40	779	32.46	81.15

From Table 3 showed that the efficiency of learning activities during class was 80.85, and the efficiency of post-tests was 81.15, which according to defined criteria of 80/80.

6. Discussion

Blended distance learning with competency-based classroom simulation activities consisting of 3 preparatory stages (preparing learning environment, preparing activities, preparing minds); teaching stage (planning, online teaching, supervision) and evaluation stage (360-degree all-round assessment, satisfaction assessment). The reason why there were three stages because classroom management was a major challenge for many teacher students. These challenges position the need for teacher students to experience the challenging behavior of students in less pressurized environments. Students can have the opportunity to make mistakes without negative impact like, deducting the score from their teacher. The use of virtualization is seen as an opportunity to give teachers a unique opportunity in advance (Oliver McGarr, 2020). In accordance with McGarr et.al. (2017) pointed that virtual classroom simulations would theoretically link with practice and facilitate teacher students in more controlled and safer environment than the actual classroom. Moreover, students and teachers would work together to correct some shortcomings from training, increasing accuracy and allowing them to communicate what they had simulated. In addition, the policy of online teaching and learning to prevent the spread of coronavirus 2019 has led researchers to develop teaching models and

learning activities (Duangpim et.al., 2021; Tongbunma et.al., 2021; Antriyandarti, 2022; Phanchamlong et.al., 2022).

It is said that online learning is a place where instructors must prepare an online learning environment. Teacher must be able to create understanding for students to simulate the classroom and reflect on what they learn in the form of supervision. Additionally, the bottom-line is to make a 360-degree all-round assessment. However, Deshpande et.al. (2015); Markham et.al. (2015); Markham et.al. (2017) mentioned that assessments from other relevant parties (triangular or third party) would provide information to help fill in the missing or distorted parts. This will bring data from a wide range of perspectives and experiences is pieced together into a complete picture, better than one evaluator may provide a limited or biased perspective on the issues.

The evaluation of the appropriateness of learning activities by 5 experts was at the highest level. The research presented that each step can clearly promote preservice teachers' ability to teach online. Therefore, experts have the highest level of understanding and assessment of the appropriateness of learning activities. According to Pedroso et.al. (2022), who researched on the prospects, appropriateness, and adoption of online learning: the case of social studies education in a public university in the Philippines was found this research found that online learning has prospective futures, is appropriate, and can be implemented in social studies education.

The efficiency of developed learning activities efficiency equals 80.85/81.15, according to a defined criterion 80/80. This may be due to the fact that the researchers have designed activities with clear procedures. Moreover, the experts consider evaluating learning activities appropriate for learning management. Therefore, once the learner has participated in the learning activity, the learner will be able to participate in the learning activity. Scores can be given during classes, while using classroom simulation and post-study tests effect to the effectiveness of learning activities according to the criteria set by 80/80. According to Phungsuk et.al. (2017), found that development of a problem-based learning model via a virtual learning environment found that the online learning management efficiency at 80/83.93, which resembles to the standard assumption at 80/80.

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