

ENHANCING STUDENTS' LEARNING AND INNOVATION SKILLS THROUGH PROJECT-BASED LEARNING AND PEER COACHING

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ABSTRACT

This research aims 1. to evaluate students' learning skills after using project-based learning and peer coaching to pass the 70% criterion, 2. to evaluate students' innovation after using project-based learning and peer coaching, and 3. to study the students' opinions toward project-based learning and peer coaching. The participants in this study were selected by a simple random sampling method which included 76 second-year English major students, Faculty of Education, Suan Sunandha Rajabhat University. The instruments used in this study included a learning skill assessment form, an innovation skill assessment form, and questionnaires. The data were analyzed by the application of percentage, mean (\bar{x}), and standard deviation (S.D.). The findings revealed as follows: 1. After using project-based learning and peer coaching, the students achieved the assessment criteria in all aspects. 2. The average of students' innovation was at the highest level. The most averages were the language used and the practical innovation, followed by the illustration and creativity. 3. The students' opinions toward project-based learning and peer coaching were at the highest level. The highest average item consisted of 2 items, project-based learning encourages students to have worked on the procedures systematically, and promotes them to study, explore, and solve problems on their own. Next, project-based learning encourages students to learn through a group process, to create teaching materials or innovation, and peer coaching promotes students to exchange learning together freely and creatively. The outcomes of the study were a great pointer for ESL educators to deploy project-based learning and peer coaching as teaching methodologies to enhance students' learning and innovation skills.

Keywords : Learning and Innovation Skills, Project-Based Learning, Peer Coaching

INTRODUCTION

Society's changing circumstances entered the 21st century. This is the era when innovative inventions were created to help meet human needs for life. Education needs to be adjusted to keep up with the changes that have been made to prepare learners to immerse themselves in the society of the 21st century. According to a survey of skills for the labor market in 2025 conducted by the World Economic Forum 2020, it was found that most of the skills that require up-skill and re-skill are those related to the use of technology and design skills; both analytical thinking and innovation; active learning and learning strategies; complex problem-solving, critical thinking, and analysis; creativity, originality, and initiative; leadership and social influence; technology use, monitoring, and control; technology design and programming;

resilience, stress tolerance, and flexibility; reasoning, problem-solving, and ideation (World Economic Forum, 2020b). For globalization and technological advancements in 21st-century societies, new demands and challenges for individuals and organizations are strengthening the competitiveness of innovation in the global economy (Khan, Jumani, & Gul, 2019). Learning and innovation are considered the most important skills. Therefore, learning must be designed so that learners can form a process of creating new knowledge and the creation of learning outcomes that affect learning skills and innovation in the 21st century. (Kalaya Soising, 2020) Behavior indicators that reflect the attributes of people with learning and innovation skills include critical thinking and problem-solving, communication and collaboration, creativity, and innovation (Prateep Khongcharoen, 2021; Battelle for Kids, 2019; Supunnee Chanprasert, 2013).

For the aforementioned concepts, it can be seen that learning management is very important to develop and encourage learners to develop these skills. The concept of organizing learning activities that will facilitate learners' learning skills and innovations is based on several approaches, such as active learning, project-based learning, and a design thinking process (Prateep Khongcharoen, 2021). Furthermore, the teaching paradigm shift encourages learners to participate in classes, and creates interaction between teachers and learners, teachers act as facilitators, mentors, coaches, and mentors for learners to build knowledge. (Office of the Basic Education Commission, 2013).

Considering the various learning approaches mentioned above, project-based learning is a form of learning management that the researcher is interested in since it is a teaching method that emphasizes learners learning through practical experiences and encourages inspiration and encouragement in learning. Besides, the difficulties facing it have been identified, explore innovation to solve problems on your own, develop cooperation, and be encouraged by teachers. (Jariya Pichaikham, 2016). Additionally, peer coaching is a method that the researcher uses to encourage learners to develop desirable learning attributes, reinforce desirable new ideas or new skills to make them clearer, and exchange ideas and teaching experiences (Vichai Wongyai and Marut Patphol, 2019).

Based on the above-mentioned concepts, therefore, the researcher is interested in developing learners' learning and innovation skills using project-based learning and peer coaching. These learning methods encourage learners to develop learning skills and create innovations, learn to acquire new knowledge, learn how to study, dare to confront difficult challenges, interact, and create innovations to fulfill the needs of developing learning skills and generating innovations in the 21st century.

LITERATURE REVIEWS

1. Learning and innovation skills

Learning and innovation skills are one of the most important 21st-century skills. Learners need to learn and innovate. Students must have the following attributes: Battelle for Kids (2019)

1) Critical thinking and problem-solving

For learners to innovate in response to the problems or needs of individuals in that society. Students must analyze problems or needs and evaluate the data with critical thinking to explain the cause of the problem and lead to the effective selection of solutions.

2) Communication and collaboration

During the process of innovating, learners must effectively communicate their thoughts and perspectives, both speaking and writing with team members, and engage in collaborating with others following their responsibilities to achieve their shared goals.

3) Creativity and innovation

To innovate, learners must brainstorm creative ideas with others to create new and practical innovations. Key behaviors of creativity and innovation include thinking creatively, working creatively with others, and implementing innovations.

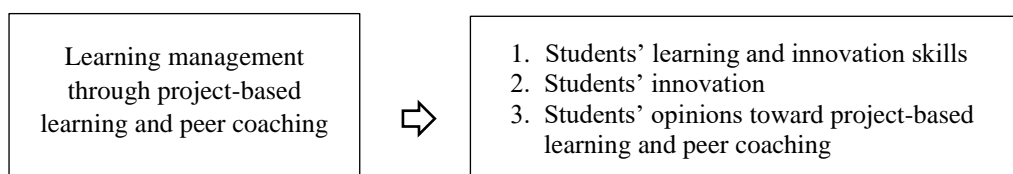
2. Project-Based Learning

Project-based learning is a form of learning management that promotes creative problem-solving skills. Project-based learning is the process of seeking knowledge or researching what learners want to know or wonder about in a variety of ways. Making decisions together using a variety of methods and learning resources. To obtain pieces that can be used in real life. Instructors must encourage learners to do more research by providing learning resources to improve their knowledge and providing mentors for recommendations that can lead to productivity or performance (Jariya Pichaikham, 2016).

3. Peer coaching

Peer coaching is a technique used to motivate learners to acquire desired learning characteristics, strengthen desired new concepts or abilities to make them more comprehensible, and share ideas and learning experiences. (Vichai Wongyai and Marut Patphol, 2019).

CONCEPTUAL FRAMEWORK



OBJECTIVES

1. To evaluate students' learning skills after using project-based learning and peer coaching to pass the 70% criterion.
2. To evaluate students' innovation after using project-based learning and peer coaching.
3. To study the students' opinions toward project-based learning and peer coaching.

METHODS

This research is a pre-experimental design that has a single target group measured after a single experiment.

Participants

The participants in this study were selected by a simple random sampling method which included 76 second-year English major students, Faculty of Education, Suan Sunandha Rajabhat University.

Research instruments

The research instruments used in this study included a learning skill assessment form, an innovation skill assessment form, and questionnaires.

Data collection

1. Clarified the purpose and preliminary agreement with the sample students.
2. Applied project-based learning and peer coaching in learning activities for 4 months.

Project-based learning was performed through the following 6 steps (Adapted from Piroon Sirisakdi, 2015):

Step 1: Identify problems for innovation

For this procedure, students were divided into 12 groups, each of which discussed the problems of learning English in school while practicing their teachers' professional experiences.

Step 2: Search for knowledge

Students searched for English knowledge or content including how to use technologies for creating innovation.

Step 3: Design a prototype

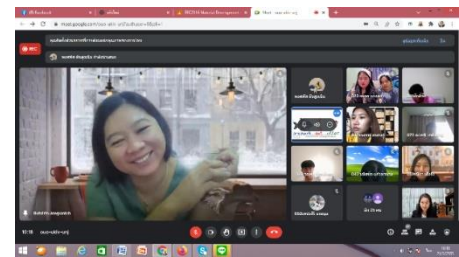
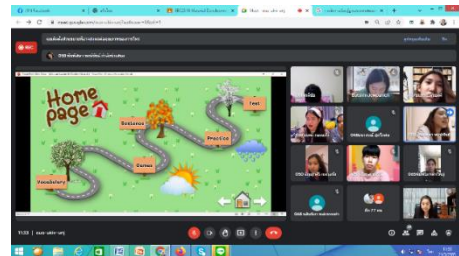
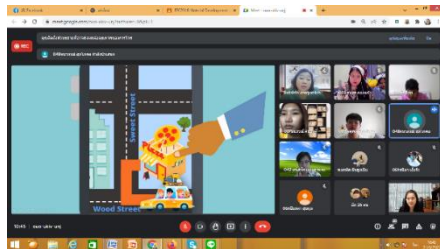
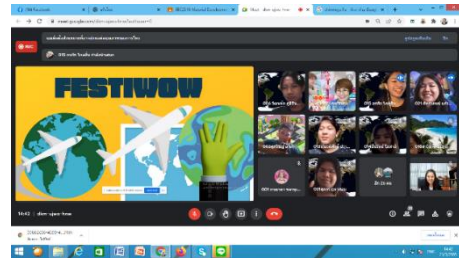
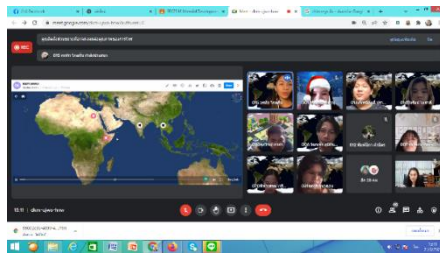
In this step, students planned and designed a prototype for innovation. The researcher provided feedback to all groups of students.

Step 4: Project implementation

At this stage, students in each group created innovations according to the planned prototype. Every week, students present the process and progress of their learning. The researcher started the peer coaching process as follows: The researcher provided feedback on the students' work through an open-ended question that inspired reflection including encouraging students to recognize, understand, and solve problems. Meanwhile, students gave advice and feedback to their peers. They observed each other's work processes and provided feedback to them.

Step 5: Presentation

All groups of students presented their work. At this stage, the researcher together with 2 primary teachers from Demonstration School, Suan Sunandha Rajabhat University evaluated their work and gave feedback to all groups.



Step 6: Evaluation

The researcher evaluated the student's work, both their performance and their behavior.

3. The researcher assessed students' learning and innovation skills in each group using the learning skills assessment form and the innovation skills assessment form.
4. The researcher had students complete the questionnaire about their opinions toward project-based learning and peer coaching.
5. The data were collected for statistical analysis.

Statistics

The data were analyzed by the application of percentage, mean (\bar{x}), and standard deviation (S.D.)

RESULTS

1. Evaluating students' learning and innovation skills after using project-based learning and peer coaching

Table 1 The scores and percentages of the students' learning and innovation skills after using project-based learning and peer coaching

Content	Level of opinion		
	Scores (Total = 60)	Percent	Pass 70% criterion
1. Critical thinking and problem-solving	52	86.67	✓
2. Communication and collaboration	56	93.33	✓
3. Creativity and innovation	54	90.00	✓
Total	54	90.00	

The findings revealed that students achieved the assessment criteria on all aspects, with an average score of 54.00, representing 90%. The highest score was communication and collaboration with 56 points, representing 93.33%, followed by creativity and innovation with 54 points, representing 90.00 %, and critical thinking and problem-solving with 52 points, representing 86.67% respectively.

2. Evaluating students' innovation in each aspect after using project-based learning and peer coaching

Table 2 Mean and standard deviation of the students' innovation after using project-based learning and peer coaching

Content	Level of opinion		
	\bar{x}	S.D.	Meaning
1. Content	4.58	0.51	Highest
2. Illustration	4.67	0.49	Highest
3. Sound	4.41	0.51	High
4. Font	4.33	0.65	High
5. Language used	4.75	0.45	Highest
6. Pattern	4.50	0.52	Highest
7. Creativity	4.67	0.49	Highest
8. Practical innovation	4.75	0.45	Highest
Total	4.58	0.06	Highest

The result revealed that the average students' innovation, in general, was at the highest level ($\bar{x} = 4.58$, S.D. = 0.06). When considering each aspect, it revealed that the language used, and the practical innovation was at the highest level ($\bar{x} = 4.75$, S.D. = 0.45). Next, illustration and creativity were at the highest level ($\bar{x} = 4.67$, S.D. = 0.49). Then, the content was at the highest level ($\bar{x} = 4.58$, S.D. = 0.51).

3. The studying students' opinions toward project-based learning and peer coaching

Table 3 Mean and standard deviation of students' opinions toward project-based learning and peer coaching

Content	Level of opinion		
	\bar{x}	S.D.	Meaning
Project-based learning encourages students as follows:			
1. Students learn through a group process.	4.75	0.45	Highest
2. Students learn and choose what interests them.	4.50	0.52	Highest
3. Students have worked on the procedures systematically.	4.83	0.38	Highest
4. Students study, explore, and solve problems on their own.	4.83	0.38	Highest
5. Students create teaching materials or innovations.	4.75	0.45	Highest
Peer coaching encourages students as follows:			Highest
6. Students exchange learning together freely and creatively.	4.75	0.45	
7. Students create guidelines and plan collaborations.	4.58	0.51	Highest
8. Students provide feedback on their work.	4.67	0.49	Highest
9. Students appreciate and value the success of job creation.	4.50	0.52	Highest
10. Students create teaching materials or innovations	4.67	0.49	Highest
Total	4.68	0.04	Highest

The findings showed that students' opinions toward project-based learning and peer coaching were at the highest level ($\bar{x} = 4.68$, S.D. = 0.04). When considering each item, it revealed that all items were at the highest level. The highest average item consisted of 2 items, project-based learning encourages students to have worked on the procedures systematically, and promotes them to study, explore, and solve problems on their own ($\bar{x} = 4.83$, S.D. = 0.38). Next, project-based learning encourages students to learn through a group process, to create teaching materials or innovation, and peer coaching promotes students to exchange learning together freely and creatively ($\bar{x} = 4.75$, S.D. = 0.45). The last peer coaching promotes students to provide feedback on their work and create teaching materials or innovation ($\bar{x} = 4.67$, S.D. = 0.49).

CONCLUSION AND FUTURE WORK

The conclusion was illustrated based on the objectives as follows:

1. Students' learning and innovation skills

After using project-based learning and peer coaching, in general, the students achieved the assessment criteria in all aspects. The three highest scores were communication and collaboration, followed by creativity and innovation, and critical thinking and problem-solving, respectively. The results illustrated that project-based learning encourages students to communicate, exchange knowledge, and collaborate in groups. Furthermore, it develops students' learning and innovation skills and promotes their creative work. It is consistent with

the concept of project-based learning. Pimpun Dechakupt (2010) said that project-based learning was the study of discovering new knowledge, new inventions, and new methods on the student's own, and providing students to communicate and work in groups. Teachers and experts were available to provide them with advice. Moreover, it is in line with Dusadee Yolau (2014), who claimed that it was the learning arrangements that students were interested in. Students were learning through a group work process, which led to the conclusion of new knowledge and tangible works. It is also consistent with the findings of Nattharika Konngoen (2015) who found that students who received project-based learning had statistically significantly higher post-test creativity mean scores than pre-test at .05.

2. Students' innovation

The average of students' innovation was at the highest level. When considering each aspect, it revealed that the most averages were the language used and the practical innovation, followed by the illustration and creativity, and then the content respectively. From the results above, the language used was the highest average. This is because students are majoring in English, and the language used appeared in innovation is quite well and accurate. Additionally, the innovation could be easily used with uncomplicated procedures, there were beautiful and appropriate pictures. The innovations were creative, and the content was appropriate for the age and grade level of students. That's probably because feedback from teachers and friends was regularly provided, and students are more fully reworked for innovation to be completed. It is consistent with Maream Nillapun (2012), who discussed the nature of innovation, and that good innovation must be standardized, valuable, and achieves the desired goals and quality. It is in line with Natchakan Wirattanachaiwan (2018), has stated that constructionism was learning from the power of knowledge. If students could create pieces based on appropriate technological materials, they will be able to create their work concretely with good quality. Furthermore, it is consistent with Sudarat Srima and Wannaporn Chujitarom (2020), their findings revealed that the evaluation of the animation innovation from the sample group scored at a very good animation innovation level.

3. Students' opinions toward project-based learning and peer coaching

The students' opinions toward project-based learning and peer coaching were at the highest level. The highest average item consisted of 2 items, project-based learning encourages students to have worked on the procedures systematically, and promotes them to study, explore, and solve problems on their own. Next, project-based learning encourages students to learn through a group process, to create teaching materials or innovation, and peer coaching promotes students to exchange learning together freely and creatively. The last peer coaching promotes students to provide feedback on their work and create teaching materials or innovation. It is due to project-based learning management encourages students to systematically study, research, and learn on their own. This corresponds to the ideas of Pimpun Dechakupt, and Phayao Yindeesuk (2016), who said that project-based learning was the study of discovering new knowledge, new inventions, and new methods on their own, using systematic mathematical methods. Furthermore, it's in line with Boonyarit Piyasri (2020) who stated that coaching is an effective form of mentoring. It was a way of encouraging teachers and associates to think, discuss, and reflect. This is consistent with the research of Liu & Lee (2013), who studied the use of feedback to improve learning using peer-to-peer activities in an

online format. The results showed that by receiving feedback from peers, they improved their knowledge and abilities.

The future work was presented as follows:

1. Study students' innovative performance using projects based on other teaching approaches such as Hybrid learning or HyFlex Learning.
2. Promote students' other skills using a variety of instructional methods.

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