Project-based Learning and Problem-based Learning in a General Education English Course: Analysis of Similarities and Differences

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Abstract

In order to fully understand the two commonly-used methods for which the same acronym, PBL, is adopted, the aim of this academic paper is to investigate both the similarities and the differences of the lessons designed with project-based learning and problem-based learning, which are both student-centered approaches of teaching also classified as active learning approaches. First, the theories underlying both approaches will be explained. Second, examples from the experience of the author with the English language courses designed with either Project-based learning or a Problem-based learning are presented and discussed with an emphasis on the expected learning outcomes and the processes of student learning. The steps adopted for each approach are illustrated, highlighting how the courses can be organized and managed. In the final section of the paper, the author shares how the Project-based Learning approach is similar to and different from the Problem-based Learning approach (146 words).

Keywords: Project-based learning, Problem-based learning, Active learning, Curriculum design

1. Introduction

In this age when the search for the most effective teaching techniques for classroom teaching is proactively pursued based on the belief that appropriate techniques definitely lead to desired learning outcomes that have earlier been planned for (Office of Curriculum, Assessment and Teaching Transformation, University of Buffalo, 2023), all of the teachers obviously join the bandwagon. However, not all experts support this development. One of them, Brown (2002, pp. 9–12) pointed out that this indeed had been a fashion of the last period of the mid-1880s to the mid-1980s when most English language teachers tended to believe that they could teach effectively with one single method. Thus, we should be aware that first, in teaching and learning, especially the English language, teaching techniques may not be the magical tools which will help the teacher of a class effectively manage his or her class and second, students learn successfully because of other factors that influence student learning such as intrinsic motivation (Dornyei, 2001), meaningful learning (Ausubel, 1968) and self-regulation (Zimmerman, 2008).

There have been numerous studies that investigated what enhances student learning and what hinders it. There are other factors related to the students themselves such as student engagement, the learning environment (Willms, 2009) and their choice of learning strategies (Oxford, 1990). Thus, exclusively searching for the right teaching techniques may take us in the wrong direction that focuses on only ‘teaching,’ not ‘learning,’ which is the focus of the moment.

If it is believed that learning can be brought about once the right technique is employed, it means there should be various models of teaching and learning to follow. However, this is not easy. One of the lecturer’s colleagues once remarked, “Our teachers will be able to teach well if there are some guidelines given to them about the steps to follow—what to do at the beginning of the lessons and the steps to do later.” I remember laughing and quickly responding to this remark: “Come on, my dear friend, our students are not robots, and the teachers are not teaching robots.” We ended our conversation by laughing together at the

image of students and teachers as robots. One point to think about is, “In the field of teaching and learning English, can teachers and students teach and learn by moving through steps?”

The field of English language teaching and learning has been fully developed with accumulated knowledge and wisdom synthesized from the experiences of all the key players be they theorists, teachers, students or researchers. According to Larsen-Freeman (2000), the field began with the introduction of the Grammar-Translation Approach, which was influenced by the School of Behaviorism, whose belief about learning a new language is that of habit formation through stimulus, response and reinforcement and “which was strongly influenced by studies of animal learning by Ivan Pavlov (1849–1936) and Edward Thorndike (1874–1949)” (Karpov, 2014, p. 4). Studying English at that time involved learning about the language, mainly grammar. Students learned the rules of the language such as when to use ‘a, an, the’ or ‘how to change the verbs to make them past simple tense.’ Memorization was commonly used. Thus, successful learners would be ones who understood how various components of the language function. This theory of language learning mainly focused on producing language users who excelled in reading and writing. Later, the approach was soon discouraged, as the “native speaker of English model” seemed to become the goal for the mastery of the English language with an emphasis on accuracy and learning the rules of the English language.

As a result, several ways to master the English language have been suggested. These include the use of the Direct Method, which is based on the belief that “language is primarily spoken, not written” and the Audio-lingual Method, which promotes “everyday speech.” It calls for tremendous practice with the sounds in English in terms of stress, pronunciation, and intonation patterns (Larsen-Freeman, 2000).

In the scenario of that time, communicative language teaching appeared to the delight of many. It was wholeheartedly approached by all in the field of English language teaching and learning. The main goal of this approach is an emphasis on communicative competence based on the belief that language is for communication. The students should have knowledge of the functions in the language. The picture in the mind of most people was probably that language functions may be emphasized over forms. The goal of the time was probably based on the idea that accuracy may not be as significant as fluency (Larsen-Freeman, 2000, pp. 130–131). Later, it was found that students were not afraid to communicate but their English use deteriorated. This is indeed a washback effect of the Communicative Language Teaching Approach, which led the field of English language teaching and learning to emphasize language functions over forms. As a result, grammatical errors have had to be tolerated by all, especially the teachers.

The field of English language teaching is so dynamic that it always moves on to find the most appropriate ways to improve ‘learning,’ the buzz word that emerged at the end of the 20th century. In other words, the Teacher-directed Learning Approach is not seen as helping students to improve English language studies as much as expected. In addition, as ‘learning’ is becoming more significant than ‘teaching,’ emphasis is now placed on student learning and the proposal that student-centered approaches should be adopted in place of the traditional methods that have been in use for decades. All curriculum designs are now geared towards putting students at the center of learning and encouraging them be responsible for their own learning. Teachers must therefore change their roles from transmitters of knowledge to facilitators of student learning, while students must adopt new roles (based on Constructivism) that they must construct their own knowledge through analyzing and synthesizing the information at hand. According to Kruse (2008), constructivism is the result of experiential learning (learning as a result of going through an experience), active learning (learning as a result of actively participating in an activity), collaborative learning (learning as a result of working collaboratively with teammates), realistic settings (learning in a real situation). choice of content and

activities (learning as a result of freedom to choose what to learn and the activities to be involved in), and a holistic approach (learning as a result of seeing all separate topics within one issue).

Clearly, the focus is now on the learner self-management. Students will learn if they decide and act on it. Dornyei (2001, p. 1) says, "A motivated learner is a willing learner." Nothing else can help students improve their own learning, not even the teachers, the techniques, or the materials. Along the same lines, Bryce and Blown (2023) point out that according to Ansubel (1967), learners learn new ideas by building them upon their current knowledge. In other words, learners need to accomplish the action of learning themselves.

A number of approaches are classified as active learning approaches. According to Prince (2004; cited in Odum, Meaney and Knudson, 2021), "active learning is generally described as any pedagogical strategy that engages students in the learning process." Along the same lines, Brame (2024, p. 1) says, "active learning" means "activities that students do to construct knowledge and understanding, requiring students to do higher thinking." Examples of instruction that are considered major active learning formats are research-based learning, project-based learning, problem-based learning, case-based learning. community-based learning, field work, cooperative education, laboratory activities, special problems, and senior projects. All of these have a common property in that they encourage students to take responsibility for their own learning. In conclusion, when students are responsible for their own learning, their learning is more effective.

2. A Major Learning Concept and the Theories of Learning that Underline Project-based Learning and Problem-based Learning

A major learning concept, which is Active Learning, and two theories of learning, Constructivism and Cooperative Learning, are discussed in this section to reveal why the expected learning outcomes which are the goals of the concept of active Learning and the two theories are expected to result from Project-based Learning and Problem-based Learning. In Active Learning, students are expected to seek knowledge by themselves so as to become independent learners. Knowledge itself will become obsolete in five years. Therefore, students are expected to be skilled in knowledge application. Furthermore, they should harmoniously work with others through interpersonal skills, teamwork and intercultural understanding. In Constructivism, students are also expected to be independent learners, while in cooperative learning, the essence is that all team members in a group should work for the benefit of the whole group. Details are discussed below.

2.1 Active Learning

An ancient Chinese philosopher left us with a precious gem about learning. Confucius (551 BC–479 BC) (Vaillancourt, 2009, pp. 272–273) stated, "I hear and I forget, I see and I remember, I do and I understand. This indicates that the best way to learn is to go through an experience. In this case, Vaillancourt trained pharmacists with student co-op work experience. Subsequently, Chayanuvat (2023, p. 77) presented a similar cone of learning developed by Dale (1969) that shows how we can learn best by moving from learning passively to learning actively.

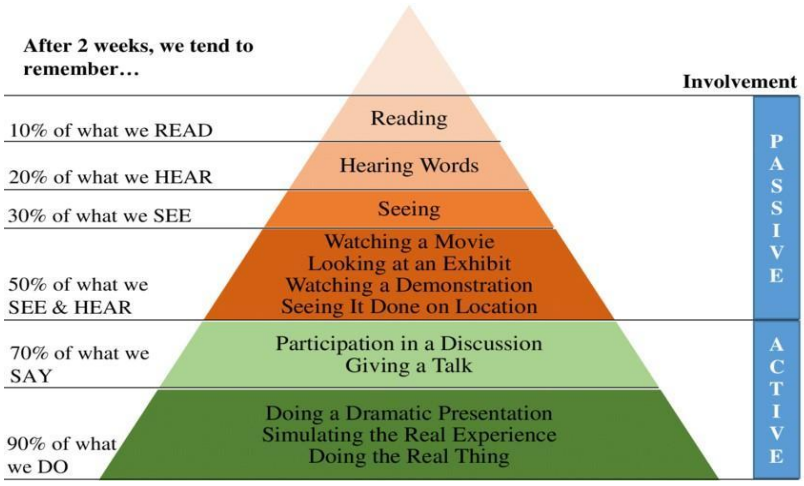

Figure 1: Cone of Learning (Edgar Dale, 1969)

The essence of learning is certainly that we need to learn actively and that we must be active learners in search of all that we want to know rather than passive learners absorbing everything from the teachers. Munna and Kalam (2021) are convinced that active learning strategies can enhance student engagement. In the modern world of the 21st century today, the trend is consideration of learning as the learners'/students' job, with the teachers needing to learn how to be good facilitators, coaches or mentors for the students instead. However, misconceptions about having students do their own learning are often found in how classes are dealt with. For example, if students must take ownership of their own learning, they should spend time in the library, not in the classroom.

2.2 Constructivism

In Constructivism, students are required to construct their own knowledge based on their experiences and understanding. This is the concept proposed by two world-renowned theorists, Dewey and Vygotsky, who believed that students can learn effectively if they explore the world themselves with the teacher's scaffolding. "Dewey claimed that experiences were immediate. We have and undergo them." (Johnston, 2010, p. 103). Therefore, the constructivist concept of teaching and learning is different from that of traditional teaching and learning. With reference to Dewey, Kapur (2019) explains that constructivism views the acquisition of knowledge as knowledge construction rather than knowledge transmission. As a result, the learners' roles consist of building and transforming knowledge. This appears at the time when the world is moving toward becoming a globalized village without borders and all knowledge can be instantly shared by various means.

In addition, students must be lifelong learners due to the constant changes of the world that require new explanations about phenomena. Skills such as curiosity and imagination are necessary for regular transformation of knowledge derived from research findings. Moreover, students of the 21st century must have critical thinking skills, teamworking skills, communication skills, agility and adaptability as well as entrepreneurial skills. The 21st century is a century of tremendous changes We are now living in the VUCA world (The world of volatility, uncertainties, complexity and adversity) (Bennett & Lemoine, 2014). Figure 2 (Chayanuvat, 2023, p. 78) shows the changes in various areas.

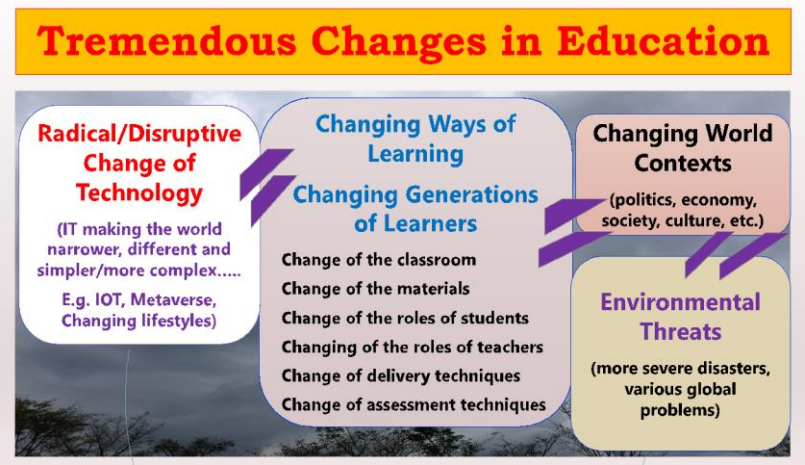

Figure 2: The 21st Century: A Century of Tremendous Changes (Chayanuvat, 2023, p. 79)

Wasinanukorn (2012) explains the reasons that active learning is significant in this era. First, integration of knowledge from various disciplines must be adopted. No single discipline is complete in itself and neither should personnel in a single field work alone. Take the health science discipline as an example. Staff members from medicine, public health, nursing, dentistry, pharmaceutical science, medical technology, etc. must join hands and share information in order to create knowledge about holistic health. This indicates that knowing the content of one subject area is no longer sufficient.

John Dewey (1859–1952) and Lev Vygotsky (1896–1934) were the two world-renowned theorists of constructivism. They provided an innovative view of the processes of child learning and development. Both shared similar views about education. For Dewey, learning is an active process that requires hands-on experience, rather than rote memorization of facts. Individuals grow and learn as they interact with the world (Poppas, 2023). Similarly, Williams (2017) quotes Dewey, saying that Dewey thought that schools and classrooms should represent real-life situations, which would allow children to participate in learning activities interchangeably and flexibly in a variety of social settings. On a similar note, according to Vygotsky, who emphasized the importance of the cultural and social context of learning, children's learning and development are the result of adult mediation, not heredity, conditioning or independent explorations (Karpov, 2014. p. 9).

2.3 Cooperative Learning

Simply stated, according to Larsen-Freeman (2000, p. 164), "cooperative learning or collaborative learning essentially involves students learning from each other in groups." The theory values the ways that students learn from one another but most importantly, the teacher helps students learn how to learn more effectively with learning strategies.

How does the Cooperative Learning Theory influence our students who live in the modern world with so many changes that affect life? The theory claims to promote common skills of the 21st century that the students must possess; namely, *learning skills* such as critical thinking, creativity, collaboration, and communication; *literacy skills* such as information literacy, media literacy, and technology literacy; and *life skills* such as flexibility, leadership skills, initiative, productivity, and social skills.

Working together in groups, students are expected to support one another in the best way they can for the benefit of the group. According to Jacobs and Renandya (2018), five basic elements of cooperative learning are:

1) Positive interdependence means that students will not think competitively and individually but cooperatively for the benefit of the group. The efforts of an individual help not only the individual to be rewarded but also the others in the group.
2) Individual and group accountability means that although students must work in groups, and each student must be individually accountable, responsibility and accountability for each other's learning is shared.
3) Interpersonal and small group skills mean that students should have teamworking skills; therefore, social skills, such as acknowledging another's contribution, asking others to contribute, and keeping the conversation calm, need to be explicitly taught.
4) Face-to-face promotive interaction means that students should be encouraged to interact in the target language for their best language learning results.
5) Group processing means that each group member should be encouraged to feel responsible for participating and for learning. Leadership should be 'distributed.'

3. Examples of EFL courses designed with Project-based Learning and Problem-based Learning

First, take a look at this course description. As we all know, General Education courses are part of the undergraduate curriculum at all Thai universities, of which individual courses vary from university to university but the prescribed categories by the Ministry of High Education, Science and Innovation are the same. English is grouped under the "Languages" Category. The two courses that the author designed with Project-based learning and Problem-based learning are for two versions of ENG-102 English for Applications, which have the same course description as follows:

> A practical basic college English course with an aim to further develop four essential skills—listening, speaking, reading and writing; training in the use of resources towards improving abilities necessary for communicative purposes based on selected theme-based materials; preparation for authentic academic discourse, with grammar and vocabulary development exercises.

3.1 Project-based learning Course—How was it designed?

The following table is the brief course outline for a Project-based learning course.

ENG-112 English for Applications
No. of Weeks = 12

Learning Objectives	Activities
1. To activate students' prior knowledge of English through the use of English in general topics. 2. To further practice English that is appropriate with the context. 3. To develop the fluency and accuracy that is necessary for basic communication in English.	Week 1: Introduction to the course and Student grouping Week 2: Appointment with the course teacher to present the plan and the topic area for the project Week 3: Progress Report 1 Week 4: Independent Study Week 5: Progress Report 2 Week 6: Independent Study Week 7: Independent Study Week 8: Progress Report

4. To prepare students for academic discourses. 5. To encourage students to enjoy self-directed and life-long learning.	Week 9: Independent Study Week 10: Independent Study Week 11: Project Presentations Week 12: Project Presentations ***_**Independent Study**_ refers to going on field trips, meeting people, making appointments with resource persons, searching for information in various ways and planning presentations. Projects that students have adopted in the author's classes include, for example, 1) "How to design the most comfortable chair?", 2) "Making earthen pots for plants in an act of preserving nature", 3) "The coastal changes in the perspectives of the local fishermen" and "Experiences of Nakhon Si Thammarat people in their annual floods". ***_**Progress Report**_ means meeting the course lecturer to report on the progress that the students have made and also asking questions about the projects for suggestions and guidance.

In this course, students worked together in small groups aiming to produce the best product at the end. The students themselves shared the ideas and solved all the problems that may arise. Students would be briefed on what they could expect from this course. They would work in groups with their friends from the beginning of the course to the end of the course. This is why students were believed to be active learners who constructed their own knowledge. They could meet with the course lecturer, who took the facilitating role, while they might consult an expert in the field who acted as a resource person, who the group would go to meet for consultation and for feedback on their projects. Although based on the timetable, the course was scheduled for four hours a week, two per day, students would plan their own time for certain activities such as data collection, site visits and appointments with the course lecturer and their resource persons. In this way, although the students did not meet the lecturer every week, their work would progress smoothly when they needed to meet their group members often. The final session would be for each group to present their finished products or projects. Some impressive projects were a comfortable armchair designed by a group of architecture students, an environmentally friendly earthen flowerpot, and an engineering design to prevent coastal erosion.

3.2 Problem-based Learning Course—How was it designed?

The following table is the brief course outline for a Problem-based learning course.

ENG-112 English for Applications
No. of Weeks = 12

Learning Objectives	Activities
	Week 1: Lectures 1 & 2 and Group Activity Week 2: Workshop 1 & 2: PBL Steps (Toy-Ting, I Love

1. To activate students' prior knowledge of English through the use of English in general topics. 2. To further practice English that is appropriate with the context. 3. To develop the fluency and accuracy that is necessary for basic communication in English. 4. To prepare students for academic discourses. 5. To encourage students to enjoy self-directed and life-long learning.	You) Week 3: Problem 1 Nature is Angry Week 4: Problem 2 Beauty or a Healthy You Week 5: Problem 3 Whose Child Is This? Week 6: Lecture 3 - Making Questions Lecture 4 - The English Tenses Week 7: Problem 4 Toxins in Food Week 8: Problem 5 My Boy Bank Week 9: Problem 6 My Dear Nu-Picha Week 10: Interview simulations Week 11: Roleplay activities Week 12: Writing Techniques

In this course, students were briefed at the beginning on how to study this course using Problem-based learning and they were trained before PBL lessons began. PBL is a course design using problems as a trigger to encourage students to engage in group discussions and finally search for the information about their area of study. Thus, the students would work in groups with their friends from the beginning of the course to the end of the course. This is why the students were believed to be active learners who constructed their own knowledge. The course lecturer observed how they worked in groups and assessed them. The students also evaluated the problem with help from the group facilitator. Presentation of what they gained from their literature search and written assignments were the expected product at the end of each problem. See Chayanuvat (2023, pp. 74–86) for details about Problem-based Learning.

4. Similarities and Differences of Both Teaching Methods

Similarities can be identified as follows:

1) Both can be said to be active learning teaching approaches with students taking ownership of their own learning. Thus, they work with their teammates to complete the assigned tasks, while the teacher acts as their facilitator.
2) Both are considered methods of student-directed learning, which is believed to be more effective than teacher-directed learning methods that leave the responsibility of student learning to the teacher.
3) Both can be said to promote the skills of the 21st century, namely research skills, teamwork skills. self-management skills, peer teaching and learning, communication skills and inquiry-based learning based on the idea that the teacher is not the person who does everything. There are various sources of information outside the classroom that students can access if they are independent learners.
4) Both can promote independent and lifelong learning when students are self-directed learners.
5) Both promote integration of disciplines. To complete an assigned task, students need content from several disciplines since, although English is a tool for the students, content can come from other fields.

Differences can be identified as follows:

Project-based Learning

1) Project-based learning begins with each group designing a project with the teacher, who takes the role of the facilitator of learning. The assignment depends on the instructions from the

teacher, but a product is expected to be completed at the end of the course. This product at the end of the course varies from one group to another based on what each group wants to do.

2) Project-based learning is done mainly with the act of exchanging knowledge and ideas among the group members and the teacher as the facilitator who will pose questions that lead the students to identify answers for their projects. The teacher is required to arrange regular meetings with each group of students in order to follow-up on their progress and respond to their questions as the groups solve the problems that they face in trying to finish the intended products.
3) Project-based learning ends with completion of the whole project that is ready to be presented.
4) In project-based learning, a variety of techniques can be used to arrive at an answer. For example, students will work on their own by dividing the duties among them and the group will explore various possibilities of getting the task/assignment done well.
5) Project-based learning is believed to encourage both critical thinking and creative thinking among the students as the students in each group plan the project together, and in order to improve on it, they must use their creativity and critical thinking.
6) For the English language class, students in each group do not need to use English when they plan the work together if there are only Thai students in the group. However, they must present their projects to the entire class using English and submit their reports in English.
7) Students can improve their vocabulary in the area of their projects.
8) One teacher can handle several small groups of students.

Problem-based Learning

1) Problem-based learning can be designed with several activities. A problem-based course can have some lectures with all the students studying together. For example, a well-known speaker can be invited to the class to share his or her ideas on a particular topic with the students.
2) In a small group, problem-based learning begins with a problem that triggers learning. The problem must be well prepared and well designed by the teacher in order to ensure that this problem can lead to the same learning issues that they need to work on in future.
3) Problem-based learning is done through steps that are connected and rather inflexible.
4) Problem-based learning is conducted with the use of prior knowledge in order to try to understand the problem or the scenario.
5) Problem-based learning has a fixed step that involves learning more on the topic through researching various sources of knowledge such as the Internet, some recommended books, and resource persons.
6) Problem-based learning requires students to prepare their formulated learning issues in the form of questions on what they need to know.
7) Problem-based learning works well with content-based courses. In other words, the teacher does not need to spend time preparing detailed lecture content. In PBL, students get the content from various sources, so they also need to synthesize the information they obtain from various sources of information.
8) Problem-based learning requires critical thinking skills.
9) Although students work in their groups of about eight students, the whole class of 32 students in four small groups will explore the same learning issues that they formulate from the problem. Thus, in the end, the class explores and learns the same content.
10) A number of teachers are required to supervise each small group as the students go through the steps of PBL.

5. Food for Thought

Project-based learning and Problem-based learning are two common teaching methods that can be applied to various subjects. Both help to enhance students' soft skills such as self-management, teamwork skills and research skills. English teachers may think of adopting them in place of the Grammar-Translation Method as interaction among students is encouraged by the two methods. The course designers of project-based learning and problem-based learning will first select the language focus aspects such as definition, cause-result, or compare-contrast and select the content that is required by them. Based on my experience of both approaches used with first-year university students, both motivated the students to learn with their peers and support one another. My friend's remark that I mentioned at the beginning did have some truth in it. If the teachers know how to plan their lessons, by following the guidelines, they may help to improve student learning to a certain extent. Both project-based learning and problem-based learning require clear steps to follow with some guaranteed learning outcomes. The one that an instructor decides to adopt depends on the expected learning outcomes that their course aims to achieve. To conclude, teaching is art and teachers need to be creative and reflective over the choice of the curriculum design adopted.

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