The Value of Problem-based Learning in English Language Teaching and Learning:
A Personal Reflection

Anchalee Chayanuvat

Suryadhep Teachers College, Rangsit University, Pathum Thani, Thailand
Corresponding Email: anchalee.c@rsu.ac.th

Abstract

This article discusses the value of problem-based learning (PBL), which is categorized as an active learning approach by presenting how it can be adopted for use to encourage students to develop ownership of their own learning as well as other necessary skills of the 21st century. First, the development of the field of English language teaching and learning from the past to now emphasizing the direction of the field was presented. Second, the theories of learning that underline problem-based learning were elaborated and explained followed by the concepts of active learning. Third, an example in the experience of the author of a General Education English language university course designed and implemented with problem-based learning was presented and discussed based on some highlighted issues, such as the design of problem-based learning (PBL), English as a foreign language (EFL) curriculum, and the expected learning outcomes of the course. In the final section of the paper, the author shared with the readers' points to be aware of based on the experiences of problem-based learning (PBL) curriculum design, implementation and evaluation in teaching English as a foreign language (EFL) (189 words)

Keywords: *Problem-based learning, Active learning, English language teaching and learning, English as a foreign language, Personal reflection*

1. Introduction

This paper is written with an aim to share with the readers the author's experiential knowledge based on professional practice of adopting problem-based learning as an approach to teaching a university first-year English course and reflection on problem-based learning (PBL). PBL has been in the education field for almost five decades, beginning from the medical field at Maastricht University in the Netherlands (Barrows and Tamblyn, 1980), but the field of English language teaching and learning has not maximized its usefulness. In other words, there have been more studies conducted on content-based curriculum such as dentistry,m, mnagement, nursing, science, mathematics and social sciences (McCarlie & Orr, 2010; Chuangchum, Pholchan, Nopkesorn & Pannarunothai, 2011; Kek & Huijser, 2013; Camp, Kaar, Molen, & Schmidt, 2014: Silva, Bispo, Rodrigquez, and Vasques, 2018; Nirwana & Rochman, 2018; Susan & Selbert 2021; Zamir, Yang, Wenwu & Sarwar, 2022; Almulhem, & Almulhem, 2022). It was found that few studies had been conducted on English language teaching and learning. An obvious reason to explain the situation is probably that English is considered skill-based, not content-based (Chayanuvat, 1997; Dutta, 2019).

The author, however, perceives its value as a result of trying it out with an English course for a few years while working at a university in Thailand with support from the European Union and realizes that there are ways to adopt it in English classes. In the first place, PBL caters more for student learning than other traditional teacher-centred approaches such as 'Grammar Translation'. It cannot be denied that the field of English language teaching and learning also follows the development of the major field of education—a movement away from teacher-directed teaching to student-centred learning. Thus, currently, it is commonly agreed that teaching and learning should be student-centred and that students should become active learners rather than passive learners. Besides, for English, the focus should not be about learning about the English language with the language as the only content but rather, the English language should be used as a tool for communication. For the author, PBL aims at similar learning outcomes in the students as other student-centred approaches for active or proactive learning.

[74]

The search for the right teaching techniques for an English language classroom is believed to have begun from the 20th century until now with most of the teachers joining the band wagon based on the belief that appropriate techniques definitely lead to desired learning outcomes that have earlier been planned for. However, Brown (1994, p. 28) cautions against searching for the best teaching technique by saying "Teachers can choose particular designs and techniques for teaching a foreign language in a specific context. Every learner is unique. Every teacher is unique. Every learner-teacher relationship is unique and every context is unique. Your task as a teacher is to understand the properties of these relationships and contexts." He seems to indicate that in teaching and learning, especially in the field of English language teaching and learning, techniques are not the magical tools which will help the teacher of a class and their students learn successfully by just following the prescribed techniques proposed by outsiders of the context.

The area of second and foreign language teaching has been noted as one of the most developed with supportive literature with long-time accumulated knowledge and wisdom synthesized from the experiences of all the key players be they theorists, teachers, students as well as researchers. To many educators, the field of English language teaching and learning has taken a clear and organized direction moving from one underlying theory to another with the support of studies in the area. It started off with the introduction of Grammar Translation Approach around 1950s, influenced by the School of Behaviorism. "The Behaviourists view imitation and practice as primary processes in language development" (Ellis, 1985, p. 31; Lightbown & Spada, 1993, p. 2). Studying English of the time was to learn about the language, mainly grammar. Students learned the rules of the language such as when to use articles 'a, an, the' or how to change the infinitive forms of the verbs to make them past simple tenses. Memorization was commonly used as the best method for students. Successful learners would be ones who understood how various components of the language function. The unique role of the teacher was transmitting the knowledge as he or she knows the contest best of all.

The approach was soon discouraged as "native speakers of English" seemed to be the goal for the mastery of the English language. As a result, the ways to achieve it have been suggested. These include the use of the "Direct Method Approach" focusing on "learning how to use a foreign language to communicate, while translation is discouraged" (Ellis, 1993, p.32; Larsen-Freeman, 2000, p.23, p. 29) and the "Audiolingual Approach" which promotes extensive drilling in the target language (Larsen-Freeman, 2000, p.35, p.46). However, to use English in exactly the same way as native speakers or rather near-native level is not easy. It calls for tremendous practice with the sounds in English in terms of stress, pronunciation and intonation patterns. Failure can be disheartening. Based on the findings of her study at a school in a tourist province in the south of Thailand, Koad (2014) found that students who wanted to speak like native speakers of English were considerably discouraged, while those who were not serious about making accurate sounds to arrive at perfect pronunciation were happy and improved satisfactorily.

In the scenario of that time, communicative language teaching appeared to the delight of many. It was wholeheartedly received by all in the field of English language teaching and learning as a move away from learning about the language to learning to communicate despite the fact that the word 'communicate' covers communication in the four skills: listening, speaking, reading and writing. The picture in mind that was associated with communicative language teaching was "Now, I can do away with accuracy as fluency was the goal of that period." In fact, the goal of this approach is mainly to enhance communicative competence by acknowledging the communicative interdependence of language and communication (Lightbown & Spada, 1983, p.14; Larsen-Freemen, 2000, p. 101, p. 121). Later, it was found that students were not afraid to communicate but their English use fell apart. Grammatical errors had to be tolerated by all, especially the teachers.

As 'learning' is becoming more significant than 'teaching' (Reid & Ali, 2020), students do not learn what has been taught by the teacher (Wenden, 1991; Ormrod, 1996; Larsen-Freeman, 2000). Similarly, Bodner (1986, p. 873) says "Teaching and learning are not synonymous. We can teach and teach well, without having the students learn." Emphasis is now placed on student learning and "Student-centred approach should be adopted in place of teacher-centred approach." All curriculum designs are now geared towards putting students at the centre of learning, and they must be responsible for their own learning

[75]

(Wenden, 1991; Ormrod, 1996; Larsen-Freeman, 2000). In brief, teachers must change their roles from transmitters of the knowledge to facilitators of student learning as scaffolders, Students must adopt new roles (based on Constructivism originally proposed by Vygotsky (1836-1934) (as cited in Mcleod, 2023) and construct their own knowledge through analyzing and synthesizing information at hand as proposed by Dewey (1859-1952) (as cited in Hargraves, 2021). Dornyei (2000, p.1) says, "A motivated learner is keen, committed. enthusiastic studying with vigour and perseverance." That means, without motivation and willingness to study, probably nothing else can help students improve their own learning, not even the teachers, the techniques or the materials.

A number of approaches are classified as active learning approaches. According to Wasinanukorn (2012, pp. 6-7), "active learning" means students go through their learning experience by doing the activities themselves". Examples of active learning approaches are research-based learning, project-based learning, Problem-based learning, Case-based learning. Community-based learning, Field Work, cooperative education, laboratory, special problem, and senior project. All of these have common properties. Students need be responsible for their own learning while teachers act as their guides or facilitators. However, the steps of learning depend on each type of curriculum design.

2. The Theories of Learning Underlying Problem-based Learning

The theories presented below underline active learning approaches to teaching and learning including problem-based learning.

2.1 The Active Learning Theories

An ancient Chinese philosopher, Confucius (551-479 BC) (as cited in Ni, 2014) left us a precious gem about learning:

"I hear and I forget
I see and I remember
I do and I understand"

Based on the quote above, it can be assumed that the best technique for learning is learning by doing and understanding that learning experience. Consequently, after the learner understands it and makes meaning out of it, he or she learns. The meaning obtained emerges as a result of the learner reflecting over it Similarly, Dale (1969) voices the same idea about how we can learn best by presenting to us "Cone of Learning" as shown in Figure 1 below.
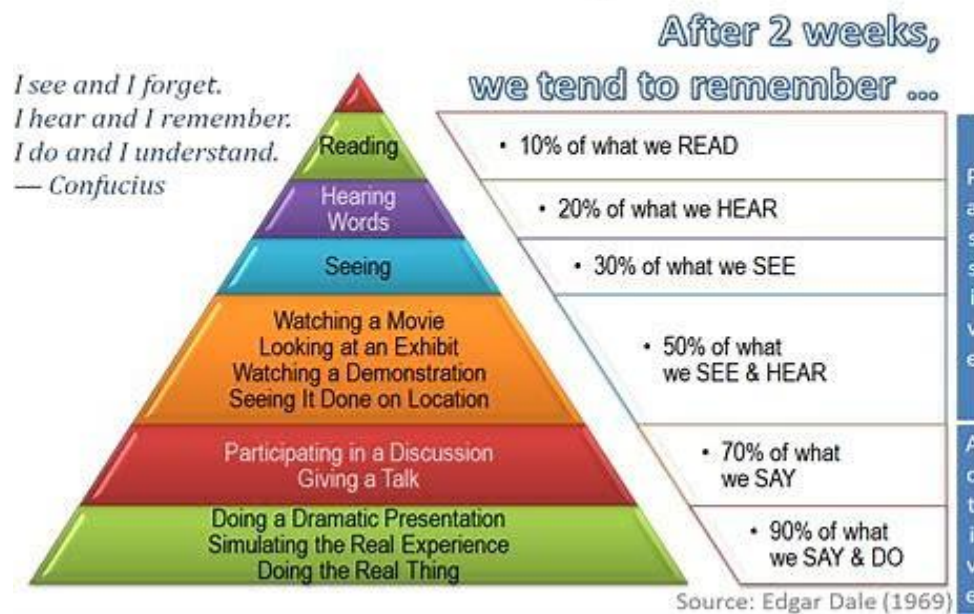
Figure 1 Dale's Cone of Learning (1969)

Based on Dale's Cone of Learning in Figure 1, learners tend to forget easily if they do not have their hands-on experience. Thus, the essence of learning is certainly that we have to learn actively and that we must be active learners in search of all we want to know rather than being passive learners absorbing everything from the teachers. Thus, in the 21st Century, the trend is that learning is the learners/students' job. Teachers should learn to be good facilitators instead. However, misconceptions about getting students to do their own learning are often found in instructions such as "Go to the library for this period" and "I am not going to explain anything—it is the students' jobs to search for their own answers." Teachers play a significant role by supporting student learning in ways that they see appropriate. They are no longer the ones who only transmit knowledge to their students.

Another scholar who contributes to the field of learning is Kolb (1984), who shares with us his Experiential Cycle which places experience as the most important factor that helps someone to learn. There are four steps in this cycle: 1) Concrete experience, 2) Reflective Observation, 3) Abstract Conceptualization and 4) Active Experimentation. Learning will take place when some experience occurs. This experience needs to be reflected over and over until it is conceptualized and this experiential learning will be tried out again. This cycle of learning will in the end bring about some kind of learning that the learner can use in various ways. Figure 2 illustrates Kolb's Experiential Learning.
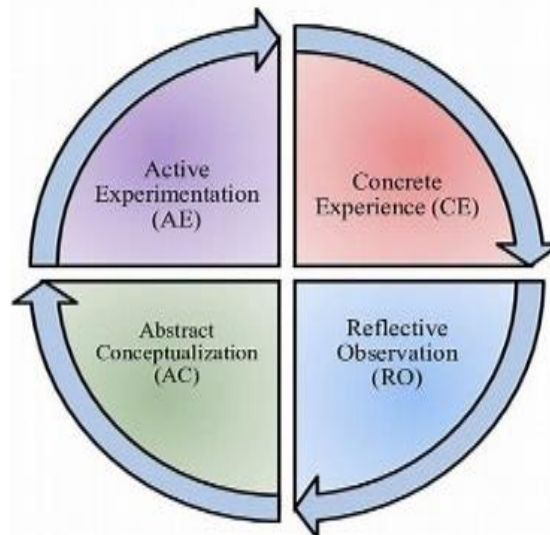
Figure 2 Kolb's Cycle of Experiential Learning (1984)

Chevase (2016, p. 127) fully supports active learning as the most effective method that gets the learners to understand the information better and retain it longer in the cooperative of learning context. Along the same line, Wasinanukorn (2012, pp. 6-7) explains why active learning is significant in this era. First, integration of knowledge from various disciplines must be adopted. No single field has complete knowledge in itself, and personnel of a single field will no longer work effectively. Taking the health science discipline as an example, knowledge from medicine, public health, nursing, dentistry, pharmaceutical science, medical technology will be enriched if the personnels from various fields join hands and share knowledge among themselves. Secondly, students must be lifelong learners due to the rapid changes in all fields (Knowledge will be obsolete within five years and the best knowledge comes from research findings.) Students of the 21st century need to have originality and creativity, communication skills, curiosity and imagination. critical thinking skills, teamwork skills, agility and adaptability as well as entrepreneurship skills. Active learning is appropriate with the rapidly changing world that transforms itself into the globalized village without borders where knowledge can be shared by various means instantly.

As can be seen, when the learners become proactive in their learning and when they reflect over what they learn again and again, they will be able to survive in this VUCA world, the Volatile, Uncertain, Complex and Ambiguous world of today, and the future (Korsakova, 2019). The students of the 21st century will certainly need to learn differently from their predecessors.

2.2 Constructivism

Dewey (as cited in Hargraves, 2021) says "Education is not preparation for life; education is life itself", so education cannot be separated from realities in life. In addition, he believes that children are not listeners and teachers are not masters. These concepts embody the theory of constructivism in that children learn by doing and from all others surrounding them. They need to build their own meaning from what they learn. Vygotsky (as cited in Mcleod, 2023) believes that the teacher is in a position to support their children fully by scaffolding them in their learning. Piaget (as cited in Nortje, 2021) suggests that children's intelligence does not remain static, related only to acquiring knowledge. Instead, children need to build or develop a mental model of their surrounding world. Thus, for the theory of constructivism, Dewey, Vygotsky and Piaget are acknowledged as the flag bearers.

According to Sarbah (2020), constructivism requires students to obtain knowledge and form meaning based upon their experiences, stating, "The constructivist approach ensures heterogeneous and cultural diversity in the classroom and facilitates easy grouping in for learners to share previous knowledge,

[78]

experience the world and reflect upon those experiences to build their own representations and incorporate new information into their pre-existing knowledge." From this quote, it is clear that constructivism encourages students to construct their own meaning from their obtained knowledge. Reid and Ali (2020, pp. 416-417) suggest that constructivism should be perceived as a paradigm of learning, not of teaching. Osborne and Witrock (1982, p. 492) say, "The brain is not a passive learner of information. Instead, it constructs its own interpretations of information and draws inferences from them." Igbal, Siddiqie and Majid (2021) state that learning through a constructivist approach, a learner becomes an independent and top-level thinker, a problem solver, a discussant, an analyst and a responsible learner under the learning environment.

As the focus of learning has turned to the learners to construct their own learning and its inferences, the learners are not living separately from the world surrounding them. Taking the ecological perspective of language teaching, Van Lier (2004, p. 259) convinced that we should learn a language in connection with the context. "A strong emphasis on contextualizing into other semiotic systems, and into the contextual world as a whole." Thus, this can be implied that students in an English language classroom should not study English as a separate specific subject where only the rules of the language are studied. For him, "Perhaps, after all, we 'learn' language in the same way that an animal 'learns' the forest or that a plant 'learns' the soil."

This means teachers and students in English classrooms must be happy to embrace various kinds of changes in life and thrive in all kinds of environment. Figure 3 shows the changes that take place in the 21st century and affect how teachers should teach and how students should learn. With reference to Van Lier's metaphor, the figure shows the 'forest' or 'the soil' for our students to live in.
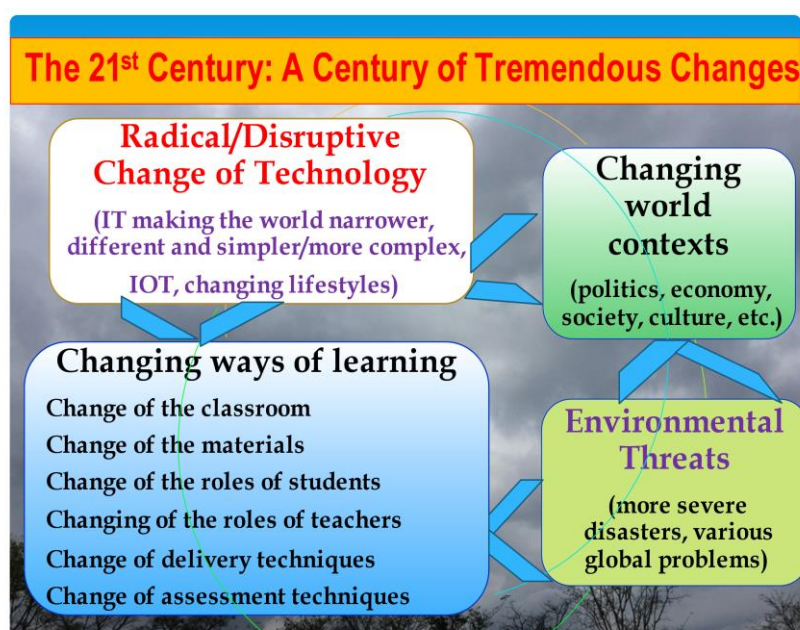

Figure 3 The 21st Century: A Century of Tremendous Changes

According to Figure 3, there are changes in at least four areas: radical/disruptive change of technology, changing world contexts, changing ways of learning, and increasing environment threats. Changing ways of learning are affected in particular by radical/disruptive of technology. Thus, learning only in the classroom is no longer possible. Various sources of knowledge are easily accessible and the teachers are not the only sources of knowledge. The changes that follow are therefore change of the

classroom, change of the materials, change of the roles of the teachers, changes of the roles of the students, change of delivery techniques, and change of assessment techniques.

Constructivism requests changes from the traditional teaching approaches general teachers including teachers of English have been familiar with. Table 1 shows the issues in education that curricula designed with constructivism must consider.

Table 1 Issues in Education for Curriculum Design

Traditional Approach	Student-centred Approach
--Subject/ content	--Process
--Teacher-centred	--Student-centred
--Transmission of Knowledge	--Constructivism
--Teaching	--Learning
--Prepare for Now	--Prepare for the Future

Table 1 reveals that constructivism is an ideal approach for this century. The student-centred approach should be adopted to enhance student learning. The focus should be learning not teaching and process not product as the ultimate goal for learning is preparing students for the future, not for now. Students today will need to grow and live many years in the future world full of tremendous changes. Since the rapidly changing world is enhanced by advancement of IT in every second, students should be trained to welcome or accept unknown changes and refrain from relying too much on the knowledge available now. Kelly, McKain, and Jukes (2009) propose that educators must adapt their approaches to instruction to adapt to new reality while Professor Wicharn Panich, a well-known Thai educator and a professional doctor, delivered his advice for the teachers who attended the 6th POD Network Conference, 2011 that 1) they teach less and learn more, 2) they \go beyond subject matters, 3) they adopt student-directed learning, 4) they get their students to learn collaboratively rather than competitively, 5) they highlight team learning rather than individual learning and finally, and 6) they adopt a new paradigm of evaluation by going beyond standard tests, evaluate team learning in addition to individual learning and practice open (not secret) assessment approach.

2.3 Cooperative Learning Theory

Taming, Rashidi and Koh (2023) explain that "cooperative learning is a teaching approach where learners share information and work together in organized groups to achieve a mutual goal." In other words, learners in the same groups have the same goals of learning. They therefore share all what they know and information they have so that all the team members can work together to complete the work of the group. They realize that the work they do together will bring group success. Liebech-Lien (2022) points out that "cooperative learning differs from regular group work as it is structured by the teachers based on elements that mediate effective student cooperation." According to Doolaand, Bogker & Snijders (2023), cooperative learning may lead to the improved group work behaviour of young people (6-7 years old). According to another study by Johnson & Johnson (2018) revealed thatcooperative learning is the instructional use of small groups so that students work together to maximize their own and each other's learning.

To summarize, cooperative learning encourages cooperation among learners in the same groups. Secondly, a small group work is one main feature of classroom management. Thirdly, the success of the group is obviously the main goal of all. Finally, as group learning is prioritized over individual learning, the group can achieve higher order thinking outcomes based on Bloom's Taxonomy of Learning Domain (as cited in Reid & Ali, 2020: p.178) as shown in Figure 4.
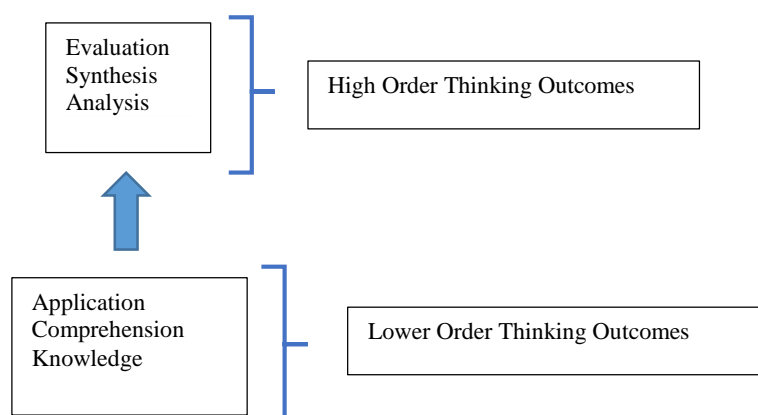
Figure 4 Bloom's Taxonomy of Learning Domain 1956

3. An Example of a General Education EFL course designed with Problem-based Learning

This course was designed with a goal to enhance students' ability in all four basic skills in English, which are listening, speaking, reading and writing as well as grammar and vocabulary.

3.1 The rationale adopted was as follows:
- Many Thai students at the undergraduate level had workable English.
- They had different backgrounds of English in terms of their learning experience. Although they were 1st year university students, they completed their high school level from different schools both in Bangkok and other provinces.
- It was found that most of them did not have the skills that enabled them to express themselves easily in all four skills, including grammar.

3.2 Objectives of the Course (A Foundation English Course and also a General Education Course)

At the end of the course, students are expected to be able to:
- develop a widened outlook of the world
- develop their understanding of nature, self, others, and society
- enhance their inquisitive mind and reasoning skills
- use English for effective communication
- develop high moral in themselves
- appreciate both Thai and international arts and cultures
- apply knowledge gained in life
- lead a proper life in society
- learn how to learn (know how they can learn best)
- develop their lifelong learning skills
- learn actively

3.3 The goals of the course designed with problem-based learning

Students are expected to develop the following skills from their small group activities when a problem given is used as a trigger:
- Communication skills
- Problem analyzing skills
- Literature review
- Hypothesizing
- Synthesizing
- Conceptualizing

[81]

3.4 The Course Description

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.

3.5 Definitions of Problem-based Learning

Barrows and Tamblyn (1980) state that a learning method is based on the principle of using a problem as a starting point for the acquisition and integration of new knowledge. The problem is encountered first without prior study of the background facts or concepts. Similarly, Camp, Kaar, Molen & Schmidt (2014) explain that PBL is an instructional approach that uses problems as stimulus. The problems used are multi-facet, cross-disciplinary, human-centred and are rarely solved by simple or linear solutions (Wang, 2021) These problems are real world's stimulation to provide the context for learning which is integrated, concept-based and cumulative. The focus is on thinking skills, small group learning, and self-directed learning (Ali, 2019).

The most outstanding feature of PBL is small group learning although the curriculum may include other activities such as field trips, exhibitions or even lectures. A course designer can design activities freely based on what content can be learned best by which activity. For PBL small groups, students learn to work in teams, search for the explanation to the phenomenon in a problem as a group and they can exercise the skills such as self-directed learning (Kek & Huijser, 2013) Prior knowledge plays a crucial role in small group discussion, and when the conclusion must be reached, critical thinking is the most important skill (Chuangchun et al, 2011, Ghani et al, 2021 and Seibert, 2021). Communication is a skill to master and ability to communicate in English will be activated if PBL is used in teaching and learning English. Besides, presentation skill which is required at the report-to-class step offers students the ability to give a well-organized oral presentation in English. This is why the author believes that PBL can be used in teaching English.

3.6 Preparation Stage consisting of the following steps:
- Beginning with syllabus design by analyzing the course description
- Drawing a topic tree with the main topics—presented to a small group of teachers
- Changing based on suggestions
- Presenting to a bigger group of teachers
- Changing based on suggestions

4. Issues to Be Aware of

The course designers will certainly face the following situations:
- Not sure about the content to cover especially the language areas (no one right answer)
- Must be brave enough to do content selection
- For English, both language objectives and content objectives are required.
- Try out the problems to see if they worked
- Recruit facilitators
- Must get the help of non-expert teachers
- Begin with timetabling (This is not easy if all other courses are adopting the traditional style of timetabling.)
- Plan teachers' regular meetings to discuss the problems or the following weeks' work
- The coordinator must get good cooperation from others.
- Communication done in various ways
    --Memorandum
    --Notes

[82]

--Calls
--Short visits
• Who will mark homework? (If not planned before)
• How to return and how to give feedback
• The Skills Lab is problematic: only two teachers ran it at the time (More students than facilitators and students wanted the lab to open at other times too.)
• How to grade must be decided in advance. Hybrid PBL calls for a careful examination of how assessment of students' performance the course should be done.
• Often, as coordinator, I tended to be over-ambitious.
• Who will mark homework? (If not planned before)
• How to return and how to give feedback
• The Skills Lab is problematic: only two teachers ran it (More students than facilitators and students wanted the lab to open at other times too.)
• How to grade must be decided in advance. Hybrid PBL calls for a careful examination of how assessment of students' performance the course should be done.
• Often, as the course coordinator, I tended to be over-ambitious.
• This was a 13-week course, so the maximum number of the problems used could be 5 to 6. That means, the course designer could add other types of activities.

5. PBL Process-The Seven-step Approach

In small groups, students have to follow the steps: 1 to 5 in one period, 6 outside class and 7 back to class to report what is found. According to the Erasmus Model, there are seven steps (Camp et al, 2014) as shown in Figure 5 below.

PBL Process-the Seven-step Approach

1. **Clarifying unfamiliar terms**
2. **Problem definition**
3. **Brainstorm**
4. **Analysing the problem**
5. **Formulating learning issues**
6. **Self-study**
7. **Reporting**

Figure 5 The Seven-step PBL, an Erasmus Model

6. An Example Problem Used in Small Groups

At the beginning of the lesson, students go into groups of eight and start to discuss the problem. First, one student takes the role of the chair of the group and another, the scribe takes note of the discussion points. Th first step is for the chair to get the group members to read the problem and make sure all the words in the problem are understood. Next, the group must discuss what the problem is in the scenario they have studied. Each member can present his or her idea freely. During the Brainstorm step, the members also discuss what they know about the problem based on their prior knowledge. They all must be given an opportunity to present their stories although the group may not like them. At Step 4, the class analyzes again from the issues discussing what the problem really is and what they intend to search for during their

[83]

literature review. At Step 5, they divide their responsibilities. Step 6 is done outside class during which self-directed learning is promoted. The group meets to prepare their report and do it when they meet again. They are expected to give their presentation on the issues and be prepared to answer the questions from the big group. As we can see, the teacher takes the role of the group facilitator, who watches the students carefully, and never providing them with answers as often happening in a traditional classroom.

The following reveals an example of a problem used to trigger student learning in small groups. This scenario is about the problems of the earth we are living on. Many natural disasters caused big damages and killed many lives. Students go through the five steps and, before they leave the class, theymake an agreement on what they want to search to explain these phenomena.

An Example Problem

Strange Happenings!

The world has had a lot of earthquakes so far. Many lives have been killed, and many houses have been destroyed. In 2004 and 2005, many natural disasters happened in Thailand. One of the worst was the Tsunami that damaged six southern provinces in the morning of 26 December 2005. Later, more earthquakes struck. Last year, Nargis, a very strong storm, killed sixty thousand Burmese victims. In May 2008, a strong earthquake struck Sichuan province of China, killing and injuring a large number of people. After 2010, it seems the world has been getting hotter and hotter. It does not rain when it should. Many areas have been very dry. Scientists say, "We are in great danger."

7. Conclusion

Based on the author's experience of having gone through the process of curriculum design, curriculum implementation and curriculum evaluation, problem-based learning has many benefits even if it is used in English language teaching and learning. Students have plenty of opportunities to use English in class to express events in life or talk about what are surrounding them or what they know very well in life.

In this way, mastery of the vocabulary is easy. They need to talk, discuss, read and write more than they usually do in a traditional classroom. In brief, the content for this English class is no longer about the English language but comes from various disciplines. Although problem-based learning is normally integrated into content-based courses, the author believes it is beneficial for an English language course.

8. References

Ali, S.S. (2019). Problem-based learning: a student-centered approach. *English Language Teaching*, *2*(5), 73-78.

Almulhem, M.A. & Almulhem, J. A. (2022). Evaluation of problem-based learning implementation in a college of medicine: a cross-sectional comparative study, *BMC Medical Education*, 22,311 (2022).

Barrows, H. & Tamblyn, R.M. (1980). *Problem-based learning-an approach to medical education*. New York: Springer Publishing Company.

Bloom, B. (1956). *Taxonomy of educational objectives*. Great Britain: Longman.

Bodner, G.M. (1986). Constructivism: a theory of knowledge. *Journal of Chemical Education*, 63, 873-877. Retrieved March 15, 2023 from http://dx.doi.org/10.1021/ed063p.873877.

Brown, H. D. (1994). *Teaching by principles*. The United States of America: Prentice Hall Regents, Prentice-Hall, Inc.

Camp, G., Kaar, A.V. H., Molen, H.V.D & Schmidt, H. (2014). *PBL step by step-- a guide to students and tutors*. Institute of Psychology, Faculty of Social Sciences, Erasmus University, Rotterdam, the Netherlands.

Chayanuvat, A. (1996). *Constructing your course materials for effective English teaching*. Bangkok: Chulalongkorn University Press.

Chevase, C. (2016). Active methods for language learning. *Social Behavioural Sciences*. 2(82). 127-135.

Chuangchum, P., Pholchan, T., Nopkesorn, T & Pannarunothai, S. (2011). Effects of an integrated team-based and problem-based learning approach for developing lifelong learning characteristics of first year medical students. *South-East Asian Journal of Medical Education*, 5 (2), 35-40.

Dale, E. (1969). *Audio visual methods in teaching* (3rd ed.), New York: Dryden Press.

Doolaard, S., Bosker, R. J. & Snijders, T.M.B. (2020). Young children working together cooperative learning-effects on groupwork of children in Grade 1 of primary education. *Learning and Instruction 67*, Great Britain: Elsevier, Ltd.

Dornyei, Z. (2001). *Motivational Strategies in the Language Classroom*. United Kingdom: Oxford University Press.

Dutta, S. (October, 2019). Why English must be treated as a skill and not as a subject. *Education Times*, Retrieved March 22, 2023 from educationtimes.com.

Ellis, R. (1985). *Understanding second language acquisition*. Hong Kong: Oxford University Press.

Ellis, R. (1993), The structural syllabus and second language acquisition. *TESOL Quarterly*. 27 (1), 81-113.

Ghani, A.S.D., Rahim, A.F.A. & Hadie, S.N.H. (2021). *Effective learning behaviour in problem-based learning: A Scoping Review Medical Science Education*, 31(3), 1199-1211.

Hargreaves, V, (2021). Dewey's educational philosophy. *The Education Hub*. Retrieved March 22, 2023 from http://educationhub.org.nz. on.

Igbal, M.H., Saddiqie, S.A. & M.A. Hazid. (2021), Rethinking theories of lesson plan for effective teaching and learning. *Social Sciences and Humanities Open 4*. Great Britain: Elsevier, Ltd.

Johnson, D.W. & Johnson, R. T. (2018). Cooperative learning: the foundation for active learning. *active learning beyond the future*. InformTech, 59-70.

Kek, M.Y.C.A. & Huijser, H. (2013). The power of problem-based learning in developing critical thinking skills: preparing students for tomorrow's digital futures in today's classrooms. Higher *Education Research & Development*, 30 (3) 329-341.

Kelly, McKain & Jukes (2009). *Teaching the digital generation*. Los Angeles, California: Corwin press.

Koad, P. (2014). Varieties of English and Thai secondary school students' standpoints. *The Symposium of International Languages & Knowledge 2014*. Penang, Malaysia: University Malaysia Perlis. Retrieved March 15, 2023 from http://despace. Unimap.edu.my/handle/123456789/34639.

Kolb, D. (1984). *Experiential learning: experience as the source of learning development*. United States of America: Englewood Cliffs N.J., Prentice Hall.

Korsakova, T. V. (2019). Higher education in VUCA-World: new metaphor of university. *European Journal of Interdisciplinary Studies*, 5 (2): 31-35.

Larsen-Freeman, D. (2000). *Techniques and principles in language teaching*. Hong Kong: Oxford University Press.

Liebech-Lien, B. (2021). Teaching teams-a support or a barrier to practicing cooperative learning. *Teaching and Teacher Education 106*, Great Britain: Elsevier, Ltd.

Lightbown, P & Spada, N. (1993). *How languages are learned*. Great Britain: Oxford University Press.

McCarlie,V.W, & Orr, D. (2010). Health science education: reviewing a framework for problem-based learning. *Journal of Dental Education*. 74 (5): 480-488.

Mcleod, S. (2023). Lev Vygotsky's Sociocultural Theory of Cognitive Development. *Simply Psychology*. Retrieved 22 March 2023 from http://simply psychology.org.vygotsky.htm/.

Ni, P. (2014). *The philosophy of Confucius. Dao Companion to Classical Confucian Philosophy*. Retrieved March 22, 2023 from Springer.com., 53-80.

Nirwana, A. & Rochman, S. (2018). Implementation of problem-based learning models in history of physics courses to promoting student learning result. paper presented at *SEMIRATA-International Conference on Science and Technology 2018. IOP Conference Series: Journal of Physics Conference:* Series 1116 (2018) 032025.

Nortje, A. (2021). *Piaget's stages: 4 stages of cognitive development & theory*. Retrieved March 22, 2023 from https:// PositivePsychology.com/Piaget-stages-theory/on.

Ormrod, J. E. (1996). *Human learning*. United States of America: Prentice Hall, Inc.

Osborne, R.J. & Wiltrock, M.C. (1982). Learning science: a generative process. *Science Education*, 12, 25-31.

Reid, N. & Ali, A. A. (2020). *Making sense of learning-a research-based approach*. Switzerland: Springer Nature.

Sarbah, B. K. (2020). *Constructivism learning approaches*. Retrieved 12 February 12, 2023 from http://www. Researchgate.net.

Silva, A.B.D., Bispo, A.C.K.D.A., Rodrigquez, D. G. and Vasques, F.I.F. (2018). Problem-based learning-a proposal for structuring PBL and its implications for learning among students in an undergraduate management degree program. *Emerald Insight*. Retrieved March 23, 2023 from www.emeraldinsight.com/2177-8736.htm.

Susan, A & Selbert, D.N.P. (2021) Problem-based learning; A strategy to foster generation z's critical thinking and perseverance. *Teaching and Learning in Nursing*, 16 (1).85-88.

Taming, M., Rashidi, N. & Koh, J.H.L. (2022). The use of cooperative learning in English as a foreign language classes: prevalence, fidelity and challenges. *Teaching and Teacher Education*, 121, Jan 2023.

Van Lier, L. (ed.) (2004). The ecology and semiotics of language learning-a sociocultural perspective. *Educational Linguistics Volume 3,* New York: Kluwer Academic Publishers.

Wasinanukorn, M. (2012) (in Thai). Active learning. *PBL WU Newsletter*. 5(1). January-March 2012,6-7.

Wenden, A. (1991). *Learner strategy for learner autonomy*. Great Britain: Prentice Hall International (UK.) Ltd.

Zamir, S., Yang, Z, Wenwu, H. and Sarwar, U. (2022). Assessing the attitudes and problem-based learning in mathematics through PLS-SEM Modeling. *PLOS Journals*. Retrieved March 22, 2023 from https://journals.plos.org/plosone/article? Id=10.1371/journal. pone. 0266363.