Energising the EFL classroom: Problem-Based Learning (PBL)

Patrick Ng Chin Leong
Ritsumeikan Asia Pacific University

Reference data

PBL as an approach is diametrically different from the conventional classroom-based and teacher-centred approach to teaching. The approach is primarily student centred (Wilkerson, 1996) and the student assumes the major responsibility for his or her learning. Rather than the teacher dispensing the syllabic content, the students decide and discover for themselves what they will learn. Problems are given as the starting point of their inquiry. PBL is a powerful tool that can be used to encourage university students to negotiate task-based projects in English. I have attempted to include PBL when designing course assignments and have found it to be beneficial in encouraging students to use more spoken English as well as develop their critical thinking and problem-solving skills. In this article I will explain how the PBL approach can be incorporated in a course assignment to enable EFL students to acquire English in a real communicative context.

　PBLは、現在多くの高等教育機関が使われている着実な教育手段である。PBLを通し、生徒の問題解決能力・思考能力を育成することができると信じるより、同学習法を項目として宿題・課題計画に入れることにする。現実的な課題を考え、生徒が英語で交渉する決意を促進するPBL事業を、私は計画しようとする。

P BL is a philosophical approach that emphasizes the effective use of problems through an approach of active and multidisciplinary learning. PBL focuses on real world challenges, higher order thinking skills, interdisciplinary learning, independent learning, information mining skills, team work, and communication skills. Rather than the teacher dispensing the syllabic content, the students decide and discover for themselves what they will learn. Problems are first given as the starting point of their inquiry. PBL is different from task-based learning as it requires students to solve real and open-ended problems where there are no fixed solutions. The problem is the trigger and motivator for learning.

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Table 1. Differences in education approaches

	Traditional classroom learning	Problem-based learning
Focus	Curriculum coverage Learning for classroom Academic rigor	Holistic development Learning for life Lifelong learning
Curriculum	Calendar defined Content segmentation and accumulation	Outcome defined Content integration

(Source : Wee, 2004)

PBL as a pedagogical tool in the EFL classroom

PBL is a powerful tool that can be used to encourage EFL university students to negotiate task-based projects in English. Through PBL assignments, students learn how to learn, evaluate sources of information, and solve language issues pertaining to problems in the real working place. At the end of the day students will be responsible for their own learning. They can learn from individual study, from their peers, and from any resources they can identify.

PBL in the classroom
The subjects

The subjects involved in this study were 200 2nd-year EFL engineering students from the School of Materials Engineering in Nanyang Technological University. As part of their course requisites, 2nd-year students in the School of Materials Engineering are required to take a few course modules in communication skills. SM112 is one of the course modules in communication skills. It is a course specially designed to improve students' skills in technical writing.

The main objective of the course is to teach students to apply skills and knowledge to write academic reports such as lab reports, industrial attachment reports, and the final year project report. Students are also taught the organisational and functional roles of major elements in a typical technical report. Each class has an average of 25 students. The course is conducted for a period of 13 weeks. Students attend 1 hour of lecture weekly, and 2 hours of tutorial fortnightly. Some lectures are conducted online, instead of face-to-face.

Group Project (Assignments)

As stated by Moesby (2002), PBL can be based on projects, which form the platform for the students' learning. For the course, students were assigned a project where they worked in a group of four or five. At the end of the course, students had to submit a final project report to their teacher. For the project, students were asked to write a report on any topic that is relevant to their course of study in Materials Engineering. Based on their topic, students also formulated

a problem in a topic they had identified. The also have to state the research question and the objective. To obtain data for the project, students then decided how to collect the data, either through survey or interview. They then submitted a final report on their findings and they also gave an oral presentation of the project to the class.

Why PBL was adopted

PBL was adopted because it was felt students were easily bored by a straight delivery of content. They were not able to critically evaluate technical knowledge in technical writing.

Description of the learning process using PBL

PBL is conducted through the following steps:

1. Students first meet to brainstorm among themselves a problem in the real world, which is technical in nature, and is related to their areas of studies in Materials Engineering. They have to define the problem to tailor it to a specific audience. Students, with the help of a teacher, in groups of four or five, examine the problem and clarify what it is they know and don't know. They also formulate possible hypotheses.

2. After students spend sufficient time brainstorming and discussing the problem they intend to solve, they identify learning issues they intend to investigate. They then submit a memo report on their proposed project, to seek approval from their teacher to proceed with their project. In the memo report, students must explain to their teacher which important problem or need their project intends to address, and describe the problem/need which their final project will help solve or satisfy. The groups then employ research strategies to collect relevant information.

3. Students discuss their findings and peer-teach what they have learnt.

4. The group then develops an outcome for the problem and presents their findings to other groups in their group project presentation, where their peers and the teacher evaluate their project.

5. Students reflect on the way they have learnt in their groups through an online survey.

A sample of students' definition of the real problem they intend to solve follows (minor editions were made to retain the authenticity of the materials):

> Ever since the invention of shaped charges during World War II, armour protection technology had always been a step behind anti-armour weaponry. The effort to upkeep with cutting technology in armour protection has led to several researches with new materials countering threats from new and improved anti-armour weaponry. The significant characteristic of armour would be the protection and mobility it provides for army personnel… Our project tries to find out the suitability of several materials for the purpose of protection without sacrificing the mobility of the vehicle and its ability to transport cargo and personnel. That is to say that we are looking at mechanical properties of some materials, trying to find a balance between strong and yet light materials that can be used for this application. Our study aims to identify the best and most suitable armour and recommend its use for armoured vehicles in the Singapore Armed Forces.

Students were asked to write minutes for every meeting and submit them as appendices in their project report. Before handing in their project report, they were also required to present their findings in an oral presentation.

Comments by students on PBL

In addition, a semi-structured interview was also conducted among students to investigate in what ways the project helped students to experience the real working life.

Student 1: "It has helped me in improving my ability to communicate with others, and helped me in knowing what teamwork is all about. I can discuss my ideas freely and in the process, I learnt how others perceive the problems. It's really good for me to do the project with others than for me to do it alone."

Student 2: "By doing this project, I have learnt the way to communicate with others effectively. Besides, I gained some knowledge about meeting skills and how to share my ideas to others effectively. Sometimes it's difficult to communicate with other students in class as we hardly have a chance to interact with others. However, through this group assignment, I have made some good friends."

Student 3: "I learnt work delegation, communication with every member and team work. From the project, we learnt how to source for information, filtering, summarizing and how to put the data in a formal format. Although this project is demanding, it was a great learning process for me."

Student 4: "We encounter various conflicts between our group members, mainly disagreement in opinions, as well as the differences in the division of workload (some members tend to do more than others). In this project, we had learnt to accommodate to each other, resolve our differences in opinions as well as leadership skill."

Student 5: "Doing this project gives me an idea of what it's like to deal with other people in project work later in the workplace, which involves using interpersonal skills such as conflict resolution and teamwork etc."

In general, students felt that they had learnt to modify their own working style or viewpoints to accommodate others. This is a positive sign of personal growth and maturity as a result of a PBL learning experience.

Conclusion

Through the comments by students, it can be concluded that PBL enables students to take charge of their learning experiences as they collaborate with each other in providing solutions to real-world problems. In addition, PBL also broadens the knowledge base of the students while engaging with the projects. The project helps students to focus on acquiring important skills, concepts, and ideas. The project also allows students to explore and verify the ramifications of these ideas, and to mimic the kinds of problems they will encounter in the real world—problems which demand careful thinking. From the their responses, there is no doubt that students generally have positive experiences with PBL

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as it encourages collaborative learning among students. Through feedback from peers, students learn to express their ideas and share responsibility in managing problem situations. PBL will serve EFL tertiary students well as they learn from the world's knowledge and accumulate expertise by their own study and research just as real practitioners do.

So far, there has not been any research on the effectiveness of using PBL in an international university in Japan. PBL will benefit students studying in an international university in Japan. I believe the main goal of most international universities in Japan is to promote international service and cooperation through all aspects of education and research endeavours. The group-based learning process of PBL suggests strong collaborative features, and therefore allows students to reap the benefits of collaborative learning. PBL could encourage domestic Japanese students to communicate in English more frequently with foreign students from diverse linguistic backgrounds. In most universities, most of the knowledge is learnt through lecture. However, this may not be relevant for students to perform well in the globalised workplace as there is a need for students to be able to interact and work well with their colleagues.

Patrick Ng received his Doctorate in Education from Leicester University, UK. His research interests include EFL teaching methodology and language planning management. He is currently teaching English and Business Communication at Ritsumeikan Asia Pacific University. <chin@apu.ac.jp>

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