Chapter 4
Project-Based Learning

Yalçın Dilekli
Aksaray University, Turkey

ABSTRACT

Project-based learning (PBL) is a teaching approach designed for active learning processes. In PBL, students produce solutions to real-life problems. While they are trying to find solutions for a defined problem, they collect, classify, and comprehend data. As PBL is a student-centred approach; it is motivational because it appeals to the students' personal differences and supports students' socialization, thinking, and self-regulation skills. PBL focuses on individual differences in a learning process whereas the evaluation of the PBL focuses on multiple points of view. Some of the basic evaluation techniques are performance-based assessment, portfolio, journal, authentic assessment (rubric). There are 13 different project-based learning approaches including community studies, designing technological gadgets, environmental projects, expeditionary projects, field study, foxfire approach, micro-society studies, museum approach, problem-based approach, project approach in early childhood education, senior project approach, service learning, and work-based learning approaches.

WHAT IS PBL?

Project Based Learning (PBL) is an instructional approach that organizes learning around projects and learning activities based on real tasks that present challenges for students to solve. PBL creates a constructivist learning atmosphere in which students construct the knowledge. In classic teaching approach, students are passive and they are expected to memorize information. From this respect PBL is a symbol of transformation from memorization of the knowledge to learning. Thus, PBL can be called a student-driven, teacher-facilitated approach in teaching and learning processes (Tan & Chapman, 2016).

In fact, PBL is not a new concept. In 20th century, Dewey introduced the idea of using real life problems during the education (Evenson & Hmelo, 2000). This idea has taken its place in formal education in 1970s in medical education as problem-based learning (Maudsley, 1999). Later, this approach became popular in engineering faculties and high schools (Boud & Feletti, 2003). Its main focus was to connect the content and its applications, in other words, it can be referred to as 'learning by doing'. Later

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problem based learned started to be used as PBL in compulsory education steps. Not only PBL but also problem based learning deals with real life problems and both of them start with a problematic situation or question. Although these two approaches seem to be the same at a first glance, they are different from each other in terms of various aspects (MEM, 2016; Blumenfeld, Soloway, Marx, Krajcik, Guzdial & Palincsar, 1991; Fleming, 2000; Dooley, 1997).

Mutual Points: Both PBL and Problem based learning start with a question, provide authentic applications of the knowledge and skills, focus on students' independence during the learning process.

Different Points: Firstly, PBL approach generally requires combining knowledge and skills from different subjects. So it can be said that PBL is multi-subject based. However, problem based learning commonly focuses on a single subject content. Secondly, PBL may continue for weeks or months, yet, problem-based learning tends to be shorter. Thirdly, PBL follows some steps which may differ from project to project, but problem-based learning has definite steps. Furthermore, PBL includes creation of products or performance, however, problem-based approach may be resulted in tangible solutions. PBL may use scenarios but often involves real world problems whereas problem-based focuses on case studies or ill structured problems. Thanks to PBL, students try to find solutions to real world problems which should encompass the content of the curriculum. According to Larmer & Mergendoller (2010), projects should have two features. Firstly, it should be meaningful for students. Secondly, a meaningful project must help learners to reach an educational goal. Moreover, project work should allow students to work outside of the school building.

Table 1. Different and mutual points of PBL and problem based learning

	Project-based learning	**Problem-based learning**
Different Points	✓ Generally focuses on multi-disciplines in a project work	✓ Generally focuses on one discipline.
	✓ Single project study takes one to four weeks.	✓ Generally shorter than PBL.
	✓ Product and performance criteria are generally definite and defined at the beginning. Every different project may be yielded different products such as posters, short films, essays etc.	✓ Products are generally tangible ones and in form of presentation or essay.
	✓ Steps may be different from project to project.	✓ The steps are definite.
	✓ Real life problems are used.	✓ Structured or fictional problems are used.
Mutual Points	✓ Start with an open-ended question. ✓ Focus on performance by using authentic application of the content and skills. ✓ Student centred activities are the base of the teaching process. ✓ Focuses on 21st century skills (e.g., critical thinking, creativity, problem solving, Using ICT, lifelong learning, etc.). ✓ Need longer time than teacher-centred teaching methods.	

Source: Larmer, C. (2015), Project-Based Learning vs. Problem-Based Learning vs. X-BL, Buck Institute.

WHY PBL?

As PBL covers the subjects out of school building, it provides students some necessary 21st century skills such as planning, critical thinking, reasoning, creativity and decision-making, strong communication skills, cross-cultural understanding, personal and social responsibility, ability to work with others, using technology appropriately where it is needed (SCANS, 1991). According to Blumenfeld *et. al.* (1991), there are several reasons to choose PBL in educational settings:

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