

Project-based learning

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Project-based learning is a teaching approach that engages students in sustained, collaborative real-world investigations. Projects are organized around a driving question, and students participate in a variety of tasks that seek to meaningfully address this question.

History of project-based learning

According to the Buck Institute for Education (BIE), project-based learning has its roots in experiential education and the philosophy of John Dewey. The method of project-based learning emerged due to developments in learning theory in the past 25 years. The BIE suggests, “Research in neuroscience and psychology has extended cognitive and behavioral models of learning — which support traditional direct instruction — to show that knowledge, thinking, doing, and the contexts for learning are inextricably tied.”¹ Because learning is a social activity, teaching methods can scaffold on students’ prior experiences and include a focus on community and culture. Furthermore, because we live in an increasingly more technological and global society, teachers realize that they must prepare students not only to think about new information, but they also must engage them in tasks that prepare them for this global citizenship. Based on the developments in cognitive research and the changing modern educational environment in the latter part of the 20th Century, project-based learning has gained popularity.

Project-based learning defined

BIE defines project-based learning as “a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks.” This process can last for varying time periods and can extend over multiple content areas.

John Thomas (2000) explains that project-based learning require “complex tasks, based on challenging questions or problems, that involve students in design, problem-solving, decision making, or investigative activities; give students the opportunity to work relatively autonomously over extended periods of time; and culminate in realistic products or presentations.”²

According to Ronald Marx et. al. (1994), project-based instruction often has a “‘driving question’ encompassing worthwhile content that is anchored in a real-world problem; investigations and artifacts that allow students to learn concepts, apply information, and represent knowledge in a variety of ways; collaboration among students, teachers, and others in the community so that participants can learn from one another; and use of cognitive tools that help learners represent ideas by using technology...”³

Methods of using project-based learning

The project-based learning approach is often used in small school settings, like charter and magnet schools, because they are affected to a lesser degree by the high-stakes state-mandated testing movement. Although project-based learning can be done in combination with the national standardized testing model, it is often difficult for teachers to effectively interweave these two seemingly different types of instruction.

In order to create effective project-based learning units, professional development organizers suggest using the following guidelines:

- Begin with the end in mind and plan for this end result.
- Craft the driving question; select and refine a central question.
- Plan the assessment and define outcomes and assessment criteria.
- Map the project: Decide how to structure the project.
- Manage the process: Find tools and strategies for successful projects.⁴

Project-based learning can involve, but is not limited to:

- Asking and refining questions
- Debating ideas
- Making predictions
- Designing plans and/or experiments
- Collecting and analyzing data
- Drawing conclusions
- Communicating ideas and findings to others
- Asking new questions
- Creating artifacts⁵

Teacher role in project-based learning

Project-based learning is only possible in classrooms where teachers support students by giving sufficient guidance and feedback. The teacher must thoroughly explain all tasks that are to be completed, provide detailed directions for how to develop the project, and circulate within the classroom in order to answer questions and encourage student motivation. In order to create successful units focused on project-based learning, teachers must plan well and be flexible. In this approach to instruction, teachers often find themselves in the role of learner and peer with the students. Teachers can assess project-based learning with a combination of objective tests, checklists, and rubrics; however, these often only measure task completion. The inclusion of a reflective writing component provides for self-evaluation of student learning.

Student role in project-based learning

Students generally work in small, collaborative groups in the project-based learning model. They find sources, conduct research, and hold each other responsible for learning and the completion of tasks. Essentially, students must be “self-managers” in this approach to instruction.⁶

Results of project-based learning research is mixed. Some studies suggest that it is an engaging instructional approach, but numerous studies have also claimed that students are not motivated by this type of learning, and that it places a great amount of stress on teachers.

Notes

1. "Project-based learning."
http://www.bie.org/index.php/site/PBL/pbl_handbook_introduction/#history. *Buck Institute for Education*. Date Accessed: 12 November 2008. [\[return\]](#)
2. Thomas, J. (2000). *A Review of the Research on Project-Based Learning*. The Autodesk Foundation. [\[return\]](#)
3. Marx, R. W., Blumenfeld, P. C., Krajcik, J. S., Blunk, M., Crawford, B., Kelley, B., & Meyer, K. M. (1994). Enacting project-based science: Experiences of four middle grade teachers. *Elementary School Journal*. 94(5): p. 518. [\[return\]](#)
4. Ravitz, J., Mergendoller, J., Markham, T., Thorsen, C., Rice, K., Snelson, C., & Reberry, S. (2004). *Online professional development for project based learning: Pathways to systematic improvement*. Association for Educational Communications and Technology Annual Meeting. Chicago, IL. [\[return\]](#)
5. Blumenfeld, P. C., Soloway, E., Marx, R. W., Krajcik, J. S., Guzdial, M., & Palincsar, A. (1991). Motivating project-based learning: Sustaining the doing, supporting the learning. *Educational Psychologist*, 26 (3 & 4), 369-398. [\[return\]](#)
6. Mergendoller, J. & Thomas, J. (2000). Managing project based learning: Principles from the field. Date accessed: 13 November 2008.
http://www.bie.org/index.php/site/RE/pbl_research/29. [\[return\]](#)