Project-based learning

From Wikipedia, the free encyclopedia

Project-based learning, or PBL, is the use of in-depth and rigorous classroom projects to facilitate learning and assess student competence (not to be confused with problem-based learning). Students use technology and inquiry to respond to a complex issue, problem or challenge. PBL focuses on student-centered inquiry and group learning with the teacher acting as a facilitator.

Purpose

Project-based learning (PBL): *best defined as instruction relating questions and technology relative to the students' everyday lives to classroom projects. Students form their own investigation of their own group which allows students to develop valuable research skills. The students engage in design, problem solving, decision making, and investigative activities. It allows students to work in groups or by themselves and allows them to come up with ideas and realistic solutions or presentations. Students take a problem and apply it to a real life situation with these projects.*

Project-based learning (PBL) provides complex tasks based on challenging questions or problems that involve the students' problem solving, decision making, investigative skills, and reflection that include teacher facilitation, but not direction. Project Based Learning is focused on questions that drive students to encounter the central concepts and principles of a subject hands-on.

With Project-based learning students learn from these experiences and take them into account and apply them to their lives in the real world. PBL is a different teaching technique that promotes and practices new learning habits. The students have to think in original ways to come up with the solutions to these real world problems. It helps with their creative thinking skills by showing that there are many ways to solve a problem.

Structure

Project-based learning(PBL): is an approach for classroom activity that emphasizes learning activities that are long-term, interdisciplinary and student-centered. This approach is generally less structured than traditional, teacher-led classroom activities; in a project-based class, students often must organize their own work and manage their own time. Within the project based learning framework students collaborate, working together to make sense of what is going on. Project-based instruction differs from traditional inquiry by its emphasis on students' own artifact construction to represent what is being learned. Students can spend the entire length of the project involved or come in and out as they see fit.

Elements

The core idea of project-based learning is that real-world problems capture students' interest and provoke serious thinking as the students acquire and apply new knowledge in a problem-solving context. The teacher plays the role of facilitator, working with students to frame worthwhile questions, structuring meaningful tasks, coaching both knowledge development and social skills, and carefully assessing what students have learned from the experience. Advocates assert that project-based learning helps prepare students for the thinking and collaboration skills required in the workplace.

Rigorous and in-depth Project Based Learning:

- **is organized around an open-ended Driving Question or Challenge.** These focus students' work and deepen their learning by centering on significant issues, debates, questions and/or problems.
- **creates a need to know essential content and skills.** Typical projects (and most instruction) begin by presenting students with knowledge and concepts and then, once learned, give them the opportunity to apply them. PBL begins with the vision of an end product or presentation which requires learning specific knowledge and concepts, thus creating a context and reason to learn and understand the information and concepts.
- **requires inquiry to learn and/or create something new.** Not all learning has to be based on inquiry, but some should. And this inquiry should lead students to construct something new – an idea, an interpretation, a new way of displaying what they have learned.
- **requires critical thinking, problem solving, collaboration, and various forms of communication.** Students need to do much more than remember information—they need to use higher-order thinking skills. They also have to learn to work as a team and contribute to a group effort. They must listen to others and make their own ideas clear when speaking, be able to read a variety of material, write or otherwise express themselves in various modes, and make effective presentations. These skills, competencies and habits of mind are often known as "21st Century Skills". For more info: http://www.bie.org/about/21st_century_skills
- **allows some degree of student voice and choice.** Students learn to work independently and take responsibility when they are asked to make choices. The opportunity to make choices, and to express their learning in their own voice, also helps to increase students' educational engagement.
- **incorporates feedback and revision.** Students use peer critique to improve their work to create higher quality products.
- **results in a publicly presented product or performance.** What you know is demonstrated by what you do, and what you do must be open to public scrutiny and critique.

Project-based learning creates opportunities for groups of students to investigate meaningful questions that require them to gather information and think critically. Typical projects present a problem to solve (What is the best way to reduce the pollution in the schoolyard pond?); a phenomenon to investigate (Why is best way to stay on a skateboard?).

Activities

When used with 21st century tools/skills [1], Project Based Learning (PBL) is more than just a web-quest or internet research task. Within this type of project, students are expected to use technology in meaningful ways to help them investigate, collaborate, analyze, synthesize and present their learning. Where technology is infused throughout the project, a more appropriate term for the pedagogy can be referred to as **iPBL** (copyright 2006, ITJAB), to reflect the emphasis of technological tools/skills AND academic content.

The PROMOTE Georgia Project [2] is an excellent example of iPBL. This 2002 Georgia Department of Education initiative was developed by a team of instructional technologists. When used effectively, research has shown PBL, and iPBL, helps teachers create a high-performing classroom in which teachers and students form a powerful learning community. The aim is for real-life context and technology to meet and achieve outcomes in the curriculum through an inquiry based approach. A PBL approach is designed to encourage students to become independent workers, critical thinkers, and lifelong learners. Many teachers and researches involved in PBL believe it makes school more meaningful as it provides in-depth investigations of real-world topics and significant issues worthy of each individual child's attention and investigation.

Another example of a successful PBL interdisciplinary school is located in Pomona, California. International Polytechnic High School, commonly abbreviated as I-Poly High School, originated in 1993, is a public college preparatory high school (9-12) located on the California State Polytechnic University, Pomona (Cal Poly Pomona) campus and operated by the Los Angeles County Office of Education in conjunction with the College of Education and Integrative Studies at the university. I-Poly is also a teacher training site working collaboratively with Cal Poly Pomona. (http://www.lacoe.edu/orgs/1021/index.cfm)

Another example of a different PBL is Muscatine High School, A four-year comprehensive high school located in Muscatine, Iowa. The school and has recently started the G2 (Global Generation Exponential Learning) consists of middle and high school “Schools within Schools”, which deliver the four core subject areas. The concept is based loosely on High Tech High’s model of education practiced in public charter schools in San Diego. 16 teachers and 9 administrators visited High Tech High in the spring of 2010, worked with High Tech High Staff in Muscatine, and spent days of curriculum development and planning over the summer. Approximately 380 students, representing MCSD demographics, are involved with the inquiry-based approach at the middle and high school levels. At the high school, activities may include making water purification systems, investigating service learning, or creating new bus routes. At the middle school level, activities may include researching trash statistics, documenting Muscatine history through interviews, or writing essays related to a community scavenger hunt. Classes are designed with an emphasis of assisting a group of diverse students to become college and career ready as they graduate from high school. Design principles that form the foundation of G2 include Personalization, Adult World Connection, College/Career Ready, and Teacher as Designer.[1]

Yet another example is the New Tech Network, http://newtechnetwork.org/, is a non-profit organization that helps high school students gain the knowledge and skills they need to succeed in life, college, and the careers of tomorrow. We work nationwide with schools, districts, and

communities to provide services and support that enable schools to implement innovative high schools that promote deeper learning.Beginning in the mid-90s in Napa, California. The local schools were meeting education standards, and the community thought of Napa High School as a good school. However, local business leaders remained concerned that meeting basic standards would not be enough to ensure that students were graduating with the skills needed to meet the needs of the new economy.These business and community leaders decided to make a difference. Working with the local school district, they began researching innovations in education to re-imagine what a truly great school might be like. In 1996, the Napa Valley Unified School District established Napa New Technology High School with the first class of 100 students.As Napa New Technology High School thrived, local business leaders and education advocates came together to ensure the school's long-term success and sustainability by establishing the New Tech Foundation. In 2001, New Tech was awarded a $6 million grant from the Bill and Melinda Gates Foundation. Today, their name is New Tech Network and they support 87 public high schools in 16 states. New Tech schools leverage what research tells us about how people learn to create an exceptional teaching and learning environment. Based on this research and our own experience, we create a rigorous and engaging high school experience that features project-based learning, the seamless use of technology, and a positive and empowering school culture.

High Tech High in San Diego is yet another example of successful project-based learning with a 21st Century flair (iPBL), as presented in this Jim Lehrer News Hour video.

Within the last several years, a handful proven models organized by PBL educators have received funding from the Bill and Melinda Gates Foundation to start holistic PBL schools across the United States. A few of those organizations include:

- EdVisions Schools [3]
- Envision Schools [4]
- North Bay Academy of Communication and Design [5]
- Big Picture Schools [6]
- New Tech Network [7]

Roles

PBL relies on learning groups. Student groups determine their projects, in so doing, they engage student voice by encouraging students to take full responsibility for their learning. This is what makes PBL constructivist. Students work together to accomplish specific goals.

When students use technology as a tool to communicate with others, they take on an active role vs. a passive role of transmitting the information by a teacher, a book, or broadcast. The student is constantly making choices on how to obtain, display, or manipulate information. Technology makes it possible for students to think actively about the choices they make and execute. Every student has the opportunity to get involved either individually or as a group.

Instructor role in Project Based Learning is that of a facilitator. They do not relinquish control of the classroom or student learning but rather develop an atmosphere of shared responsibility. The Instructor must structure the proposed question/issue so as to direct the student's learning toward

content-based materials. The instructor must regulate student success with intermittent, transitional goals to ensure student projects remain focused and students have a deep understanding of the concepts being investigated. It is important for teachers not to provide the students any answers because it defeats the learning and investigating process. Once the project is finished, the instructor provides the students with feedback that will help them strengthen their skills for their next project

Student role is to ask questions, build knowledge, and determine a real-world solution to the issue/question presented. Students must collaborate expanding their active listening skills and requiring them to engage in intelligent focused communication. Therefore, allowing them to think rationally on how to solve problems. PBL forces students to take ownership of their success.

Outcomes

More important than learning science, students need to learn to work in a community, thereby taking on social responsibilities. The most significant contributions of PBL have been in schools languishing in poverty stricken areas; when students take responsibility, or ownership, for their learning, their self-esteem soars. It also helps to create better work habits and attitudes toward learning. In standardized tests, languishing schools have been able to raise their testing grades a full level by implementing PBL. Although students do work in groups, they also become more independent because they are receiving little instruction from the teacher. With Project-Based Learning students also learn skills that are essential in higher education. The students learn more than just finding answers, PBL allows them to expand their minds and think beyond what they normally would. Students have to find answers to questions and combine them using critically thinking skills to come up with answers.

PBL is significant to the study of (mis-)conceptions; local concepts and childhood intuitions that are hard to replace with conventional classroom lessons. In PBL, project science *is* the community culture; the student groups themselves resolve their understandings of phenomena with their own knowledge building. Technology allows them to search in more useful ways, along with getting more rapid results.

Opponents of Project Based Learning warn against negative outcomes primarily in projects that become unfocused and tangential arguing that underdeveloped lessons can result in the wasting of precious class time. No one teaching method has been proven more effective than another. Opponents suggest that narratives and presentation of anecdotal evidence included in lecture-style instruction can convey the same knowledge in less class time. Given that disadvantaged students generally have fewer opportunities to learn academic content outside of school, wasted class time due to an unfocused lesson presents a particular problem. Instructors can be deluded into thinking that as long as a student is engaged and doing, they are learning. Ultimately it is cognitive activity that determines the success of a lesson. If the project does not remain on task and content driven the student will not be successful in learning the material. The lesson will be ineffective. Like any approach, Project Based Learning is only beneficial when applied successfully.

Problem-based learning is a similar pedagogic approach, however, problem-based approaches structure students' activities more by asking them to solve specific (open-ended) problems rather than relying on students to come up with their own problems in the course of completing a project.

Criticism

One concern is that PBL may be inappropriate in mathematics, the reason being that mathematics is primarily skill-based at the elementary level. Transforming the curriculum into an over-reaching project or series of projects does not allow for the necessary practice at particular mathematical skills. For instance, factoring quadratic equations in elementary algebra is something that requires extensive practice.

On the other hand, a teacher could integrate a PBL approach into the standard curriculum, helping the students see some broader contexts where abstract quadratic equations may apply. For example, Newton's law implies that tossed objects follow a parabolic path, and the roots of the corresponding equation correspond to the starting and ending locations of the object.

Another criticism of PBL is that measures that are stated as reasons for its success are not measurable using standard measurement tools, and rely on subjective rubrics for assessing results.

In PBL there is also a certain tendency for the creation of the final product of the project to become the driving force in classroom activities. When this happens, the project can lose its content focus and be ineffective in helping students learn certain concepts and skills. For example, academic projects that culminate in an artistic display or exhibit may place more emphasis on the artistic processes involved in creating the display than on the academic content that the project is meant to help students learn.

What's the Reality?

Although projects are the primary vehicle for instruction in project-based learning, there are no commonly shared criteria for what constitutes an acceptable project. Projects vary greatly in the depth of the questions explored, the clarity of the learning goals, the content and structure of the activity, and guidance from the teacher. The role of projects in the overall curriculum is also open to interpretation. Projects can guide the entire curriculum (more common in charter or other alternative schools) or simply comprise a few scattered hands-on activities. They might be multidisciplinary (more likely in elementary schools) or single-subject (commonly science and math). Some are whole class, others small group, and some individual.

Fully realized project-based teaching has never been widespread in mainstream public schooling. Teachers have little training or experience in the approach. Moreover, the time demands of projects, especially in today's context of standards, high-stakes tests, and pacing guides, understandably discourage many teachers from venturing into the kinds of collaborative student investigations that form the foundation of project-based learning.

Project-Based Learning - key features

There are several features that assist to direct the use of project-based instruction within a classroom. It is important to provide students with a specific focus.

What do you expect students to achieve from the project?

It is important that the project has a real world connection. This can be achieved through making several connections to real life experiences or situations that the specific focus age group may be facing. The project needs to allow students to not only make real life connections but also implement decision making skills, interacting with others, learning and applying new concepts and using their knowledge through a variety of education contexts. Working together with others. Collaborating with other students is a key element of Project based learning. As well as teachers and the broader community, however, the focus is on independent learning which help promote higher order thinking skills. It allows students to gain information from a variety of perspectives. Implementing research in a variety of environmental contexts is imperative through the application of several technologies including, computer programs, audio visual equipment and real life research to ensure that the full experience of the project is gained. The ultimate goal is to answer a posed question with the collaboration of others.

See also

- Experiential education
- Fremdsprachen und Hochschule (German academic journal)
- Inquiry-based learning
- Reggio Emilia approach
- Problem-based learning
- student voice
- Teaching for social justice
- Minnesota State University, Mankato Masters Degree in Experiential Education
- TAGOS Leadership Academy
- North Bay Academy of Communication and Design
- New Technology High School
- W-A-Y Program
- Valley New School
- Northwoods Community Secondary School
- Dos Pueblos Engineering Academy
- Da Vinci Schools
- Summers-Knoll School
- Metoda projektów (pol.)
- Projekt socjalny (pol.)

External links

- Project Based Learning for the 21st Century From The Buck Institute for Education

- Project-Based Learning and High Standards at Shutesbury Elementary School From Edutopia by The George Lucas Educational Foundation.
- Project Foundry- Project-based Learning Management Tool grew out of an educational non-profit in Milwaukee, WI.
- Learning for a Cause is a project-based high school creative writing initiative in Canada founded in 2003 by noted educator and writer Michael Ernest Sweet.
- [8] Changing the Face of Traditional Education: Project-based Learning
- Intel Teach Elements: Project-Based Approaches is a free, online professional development course that explores project-based learning.
- LearningReviews Directory of Project Based Learning Lesson Websites has websites with ideas, planning templates and grading rubrics.

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