

INTRODUCTION TO PROJECT BASED LEARNING

The introduction is designed to orient you to the field of Project Based Learning. Included in this section are a brief history of PBL and a description of its benefits. By the end of this section, you will be able to describe PBL and identify key elements of successful projects.

A BRIEF HISTORY OF PBL

For over 100 years, educators such as John Dewey have reported on the benefits of experiential, hands-on, student-directed learning. Most teachers, knowing the value of engaging, challenging projects for students, have planned field trips, laboratory investigations, and interdisciplinary activities that enrich and extend the curriculum. “Doing projects” is a long-standing tradition in American education.

The roots of PBL lie in this tradition. But the emergence of a method of teaching and learning called Project Based Learning is the result of two important developments over the last 25 years. First, there has been a revolution in learning theory. 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. We now know that learning is partly a social activity; it takes place within the context of culture, community, and past experiences. This is apparent in research on problem-based learning in the medical field, an important forerunner of PBL.

Research shows that learners not only respond by feeding back information, but they also actively use what they know to explore, negotiate, interpret, and create. They *construct* solutions, thus shifting the emphasis toward the process of learning. In addition, cognitive research has revealed much more about the nature of problem solving. Education has benefited from this research, as teachers have learned how to effectively scaffold content and activities to amplify and extend the skills and capabilities of students.

Second, the world has changed. Nearly all teachers understand how the industrial culture has shaped the organization and methods of schools in the 19th and 20th centuries, and they recognize that schools must now adapt to a new century. It is clear that children need both knowledge *and* skills to succeed. This need is driven not only by workforce demands for high-performance employees who can plan,

collaborate, and communicate, but also by the need to help all young people learn civic responsibility and master their new roles as global citizens.

In a sense, the need for education to adapt to a changing world is the primary reason that PBL is increasingly popular. PBL is an attempt to create new instructional practices that reflect the environment in which children now live and learn. And, as the world continues to change, so does our definition of PBL. The most important recent shift in education has been the increased emphasis on standards, clear outcomes, and accountability. Thus, one purpose of this edition of the BIE Project Based Learning Handbook is to incorporate the latest thinking on standards and assessment—to outline a planning process for *standards-focused* projects. But this process will continue to evolve. Remember that PBL is a field that you, as a practitioner, will help create by your actions and leadership in the classroom.

DEFINING STANDARDS-FOCUSED PBL

There is no one accepted definition of PBL. However, BIE defines standards-focused PBL 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 definition encompasses a spectrum ranging from brief projects of one to two weeks based on a single subject in one classroom to yearlong, interdisciplinary projects that involve community participation and adults outside the school.

More important than the definition itself are the attributes of effective projects. You will find that the BIE planning model is based on a number of criteria that distinguish carefully planned projects from other extended activities in the classroom. Outstanding projects:

- Recognize students' inherent *drive to learn*, their capability to do important work, and their need to be taken seriously by putting them at the center of the learning process.
- Engage students in the central concepts and principles of a discipline. The project work is *central* rather than peripheral to the curriculum.
- Highlight provocative issues or questions that lead students to *in-depth exploration of authentic and important topics*.

- Require the use of essential *tools and skills*, including technology, for learning, self-management, and project management.
- Specify *products* that solve problems, explain dilemmas, or present information generated through investigation, research, or reasoning.
- Include *multiple products* that permit frequent feedback and consistent opportunities for students to learn from experience.
- Use *performance-based assessments* that communicate high expectations, present rigorous challenges, and require a range of skills and knowledge.
- Encourage *collaboration* in some form, either through small groups, student-led presentations, or whole-class evaluations of project results.

The BIE model for PBL also addresses a singular need in the field of PBL: to create *standards-focused* projects that fit well with the era of accountability and performance. Often, projects have been used as fun or change-of-pace events completed after students have been pushed through homework assignments, lectures, and tests. In standards-based PBL, students are pulled through the curriculum by a Driving Question or authentic problem that creates a need to know the material. The Driving Question is tied to content standards in the curriculum, and assessment is explicitly designed to evaluate the students' knowledge of the content.

Similarly, Project Based Learning is sometimes equated with inquiry-based or experiential learning. Though PBL shares some overlapping characteristics with these two terms, standards-focused PBL is designed to acknowledge the importance of standards and evaluation of student learning. In an era of accountability, with testing and performance uppermost in the minds of parents and educators, it is imperative that all instructional methods incorporate high standards, rigorous challenges, and valid assessment methods.

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THE BENEFITS OF PBL

As a field, PBL is still in the developmental stage. For example, there is not sufficient research or empirical data to state that PBL is a proven alternative to other forms of instruction. Based on evidence

gathered over the past ten years, PBL appears to be an equivalent or slightly better model for producing gains in academic achievement, although results vary with the quality of the project and the level of student engagement. Also, PBL is not appropriate as a method for teaching certain basic skills such as reading or computation; however, it does provide an environment for the application of those skills.

More important, evidence shows that PBL enhances the quality of learning and leads to higher-level cognitive development through students' engagement with complex, novel problems. It is also clear that PBL teaches students complex processes and procedures such as

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planning and communicating. Accomplishing these goals, however, requires time for both teachers and students to master the behaviors and strategies necessary for successful PBL.

In addition to research, convincing reports have come from teachers that PBL is a rigorous, relevant, and engaging instructional model that supports authentic inquiry and autonomous learning for students. Along with encouraging academic proficiency and meeting the traditional goals of education, PBL has important benefits for today's students. Teachers report that PBL:

- Overcomes the dichotomy between knowledge and thinking, helping students to both “know” and “do.”
- Supports students in learning and practicing skills in problem solving, communication, and self-management.
- Encourages the development of habits of mind associated with lifelong learning, civic responsibility, and personal or career success.
- Integrates curriculum areas, thematic instruction, and community issues.
- Assesses performance on content and skills using criteria similar to those in the work world, thus encouraging accountability, goal setting, and improved performance.
- Creates positive communication and collaborative relationships among diverse groups of students.
- Meets the needs of learners with varying skill levels and learning styles.
- Engages and motivates bored or indifferent students.

As with any teaching method, PBL can be used effectively or ineffectively. At its best, PBL can help you as a teacher create a high-

performing classroom in which you and your students form a powerful learning community focused on achievement, self-mastery, and contribution to the community. It allows you to focus on central ideas and salient issues in your curriculum, create engaging and challenging activities in the classroom, and support self-directed learning among your students.

PBL IN YOUR CLASSROOM

Planning for a project must take into account what is possible in your classroom. The scope of a project will be affected by the bell schedule, the time of year, standardized testing, and the other myriad factors that impact your work. Perhaps the first question that usually arises is: do I have time to do this project? To answer that question, it is helpful *not* to think of PBL as taking time away from the regular curriculum. Instead, consider a standards-focused project as a central method of teaching and learning that replaces conventional instruction for a portion of your course. Standards-focused projects teach students the same essential information you might teach them through lecture and discussion. PBL teachers also find that they do considerably less “busy work” activities in the classroom. And, though projects take time to plan, teachers have more time to work with students once a project is under way.

COVERAGE VERSUS “UNCOVERAGE”

It is true that projects do not lend themselves to covering a laundry list of topics, as too often happens in the classroom. But in the case of good education, less is more. If you are pressed for time and need to include many topics in your instruction during a year, you may want to think about the concept of “uncoverage.” This means making a deliberate decision about topics that you want to teach in depth versus topics that can be simply “covered.” What parts of your curriculum can be easily and successfully handled through lectures or textbook assignments? What parts require more depth? Identify those topics that reflect the most important ideas and concepts in your curriculum—and incorporate those topics into projects. Those are the topics with which you want students to grapple. The remaining topics you can deal with through direct instruction.

ARE YOUR STUDENTS CAPABLE?

Two questions regarding students immediately arise when you are thinking about a project. How much will they be involved? And, are they capable of a project, both behaviorally and academically? Student autonomy is one of the hallmarks of PBL. Still, most teachers introduce student autonomy in stages, depending upon students' age and experience. Before planning your project, think about how much you want your students to be involved in its design and how much autonomy they will have in carrying out project activities. You may want to select the project topic, particularly for the first project in your classroom. With students who are eager and prepared, you may wish to have them select the project topic and define the learning outcomes. Your role becomes one of coach and facilitator, helping students shape the project so that it meets content standards and allows for a variety of assessments.

Are your students ready and capable? That question can be answered based only on your experience and knowledge. The Handbook will offer you ideas on how to scaffold lessons for students in a way that prepares them for the academic knowledge, as well as for the skills, that may be required for them to succeed in the project. Often, teachers do not introduce projects until the midfall or later, giving them time to assess students and prepare them for project work. If students have not had experience with projects, it's worth remembering that they will need training in such skills as collaboration, research, project management, and oral presentations. Plus, you may have to manage them closely until they have mastered self-management skills.

YOUR STYLE AND SKILLS

Once teachers feel comfortable with PBL, they usually find teaching with projects to be more fulfilling and enjoyable. PBL is a way of working with students as they discover more about themselves and the world, and that brings job satisfaction. However, in addition to strong instructional and organizational skills, PBL requires that teachers facilitate and manage the *process* of learning. Rather than rely on the model of the child as an empty vessel to be filled, PBL teachers must create tasks and conditions under which student thinking can be

revealed—a cocreative process that involves inquiry, dialogue, and skill building as the project proceeds.

Though most teachers recognize that active learning is vital, not all of us react in the same way to an open-ended process. Projects are sometimes described as chaotic or messy (though in a well-structured project, it only appears to be disorderly—it's really just the ambiguous problem-solving process that is under way). Prior to a project is a good time to reflect on your teaching style and skills. How will you operate in a PBL environment? Are you comfortable with children moving around a classroom or with the ambiguity that characterizes a more open-ended learning process?

It may help to ask yourself this question: do you prefer to be a leader or a manager? Leaders facilitate problem solving in a group and help the group find their own solutions. Managers control the process and look for prescribed outcomes. In reality, good teachers go back and forth between the two roles. But if you are hesitant to release control over your students, you may want to avoid projects or start small until you feel comfortable and skilled in project leadership.

As a leader, your job is to help each student produce a superior product by facilitating learning. As students gather data and progress in their problem solving, they will encounter obstacles and opportunities. At the heart of successful PBL is your ability to support and direct students (or conversely, your ability to let them struggle with a problem or information as they search out answers and solutions). This requires interpersonal and communication skills, as well as the ability to define the agenda for the class and push a project through to a successful conclusion. It also includes being sensitive to the fact that students finish work at different rates, with different abilities, aptitudes, and learning styles.

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PBL AND YOUR SCHOOL

PBL works extremely well in schools that have extended blocks of time instead of 50-minute periods. Similarly, when schools are formed around small learning communities such as academies or

houses, PBL is a natural tool for teaching and learning. But if your school does not have these reforms in place, it is still possible to create excellent projects for students.

You will also find that good projects in classrooms encourage changes in the culture and structure of schools. Schools are under increasing pressure to raise standards, improve climate, and personalize education. PBL can contribute significantly to this process by encouraging teacher collaboration, motivating students to achieve, using the tools and language of project management and organizational change, and helping to incorporate school-wide learning outcomes into the curriculum. In particular, PBL fits well with efforts to create a high-performance school culture that values both rigor and relevance. In addition, projects are a great way to involve parents and community members in the educational process, a result that often leads to more support for the school and a better understanding of the needs of students.

A question often asked by teachers in low-performing schools is: can Project Based Learning work in my school? It can. For students with basic skills issues, it may be necessary to include more direct instruction during a project, design shorter projects, or tie projects closely to fewer and more specific standards. But PBL offers all students the opportunity to investigate authentic topics of interest to them, thus engaging them in the learning process in ways that traditional instruction does not.