

Getting Started with Project-Based Learning

In this first installment in our new curriculum column, Diane McGrath explains project-based learning and forecasts future articles.

Project-based learning (PBL) is not a new idea. Perhaps you have done it yourself, either knowingly or unknowingly. Currently, PBL is spreading in popularity because many educators are beginning to realize how powerful it is for deeper learning. And what is new is the variety of ways technology can support and extend the possibilities for inquiry, data collection, collaboration, analysis, construction, and communication.

In this first column, I get you started thinking about PBL and give you some basic resources. I focus at first on what can be accomplished with a well-designed project and describe very generally the steps teachers and students go through as they do PBL. Future columns will discuss these topics more fully. (See *The Ongoing Project* on p. 43.)

What Is PBL?

Although no single widely accepted definition exists, PBL typically focuses

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Subject: Technology-infused PBL

Audience: Teachers, teacher educators

Grade Level: K–12

Standards: *NETS•S* 1–6; *NETS•T* II, III (www.iste.org/standards)

teaching and learning around projects that are driven by an authentic question or problem that is central to the discipline/curriculum, involves the building of a community of learners, and culminates in the presentation of a student-constructed work (e.g., a book, Web site, or multimedia presentation) to an outside audience. People who have studied PBL have described it as being:

- constructivist
- collaborative
- driven by student inquiry
- aimed at deep understanding of content
- multidisciplinary
- real (or at least realistic) in topic and context
- assessed frequently by the learning community for revision
- sustained over a long period of time

Why Should I Use PBL in My Classroom?

What can I accomplish if I try project-based learning in my subject area? Although I plan to look more deeply at the research in a future column, we can look now at some general observations that have been made:

- Students doing PBL perform as well on standardized tests, and often better than, students in traditional classrooms (Thomas, 2000). If you are worried this will hurt your kids, your

classroom, or your school, set that fear aside.

- Students doing PBL learn research skills, understand the subject matter at a deeper level than do their traditional counterparts, and are more deeply engaged in their work (Chen & McGrath, 2001; Penuel, Korbak, Yarnall, & Pacpaco, 2001).
- Teachers and parents of students learning by doing projects are pleased about children's enthusiasm and hard work when they are doing PBL (Curtis, 2002).

If teachers, students, and parents are enthusiastic and the students learn more deeply, then we have some good reasons to investigate how such classrooms look and function.

What Does This Kind of PBL Look Like?

PBL can be a good learning environment for learners of any age. In fact, I use it with my graduate students. There are a wide variety of ways that projects can be designed and carried out, but a successful project often follows the guidelines presented here.

Choosing a Topic. Before the project begins, the teacher chooses a subject for the project—a real problem, question, issue, or area of study—not just an exercise. Because it is a real topic, it is bound to cross subject boundaries and will naturally be interdisciplinary.

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Discussing and Refining the Topic.

Next, as a whole class, the teacher and students talk over the project and brainstorm the goals for it, discussing what they already know about the subject (or think they know) and what they would like to find out.

Preparing and Planning the Project.

Students are told at the beginning that they will collaborate to produce a group product and that they will show their product to a real audience (e.g., parents, other students in their school or in other states or countries, or community members) to teach the audience what they have come to learn and understand about their topic.

Because we are focusing on technology in PBL here, we will also want to set it up at the beginning that either the tools used to understand, or the tools used to construct the product, are technological and meet the ISTE (2000) National Educational Technology Standards for Students (NETS•S).

If students have never before seen such a project, this would be a good time to show them excellent student projects of different sorts, being careful not to limit their imagination to “one right way of doing it.” (*Editor’s note:* See Resources on p. 44 for sources of sample projects.)

Next, students are divided into collaborative work groups. If this is a first project of this sort, it will be important to know that it takes the students a while to catch on that they can really work together and to figure out how they should proceed. They will need to work through this new process in

stages before they take ownership of the process or the product.

Researching the Topic. The class begins its research in whatever ways you deem appropriate. Some projects begin with a field trip, some with interviews, some with reading or browsing, and some with modeling. Students will have frequent discussions about what they are supposed to be doing, what they want to do next, and what they understand that they didn’t understand before.

If you are using a new technology in this project, you will have to plan time for the students to learn how to use it. However, you may take advantage of students’ enthusiasm and talents by having them teach the technology to each other and to you.

Leading Your Students. As time goes on (I have found that this process takes about three weeks, McGrath et al., 1995/1997), students will change from passive to active and begin to run the project almost by themselves. At this point you can begin to work more intensely with individuals and groups to scaffold their inquiries, connect them with resources (e.g., people, books, CDs, Web sites), and guide and encourage them toward their learning goals.

Here is where it becomes a lot of fun for us as teachers. Remember why we wanted to get into teaching? It was probably because we enjoyed learning, enjoyed creating a learning environment for youngsters, wanted to see kids “get it,” and wanted to be the ones to help kids understand the world and learn how to be successful in it.

The Ongoing Project

In this new column, I and other writers will explore the ways you might design PBL activities using technology for K–12 students. Each column will provide some reading, resources, and Web links for you to explore the subject more deeply. (*Editor’s note:* Annotated links will appear on the author’s PBL Web site. See Resources at the end of the article for this and other URLs.) And we will raise and try to answer questions that you might have about PBL using technology, such as these:

- What is project-based learning (PBL), and why would I want to do it?
- How can I get started? Where will I find the time? Won’t I lose some control over my classroom? Won’t it look like chaos to my principal?
- Are there ongoing projects I can join or use as a model? If I invent a project from scratch, what things do I need to consider? What kinds of projects can I do using technology?
- What possibilities are there for PBL using handhelds? How can I learn more about the portable technologies for PBL?
- How do I get my students to collaborate? What if I have limited equipment?
- How will I know what they have learned? Won’t their test scores go down when I take time out of what I have to cover to do PBL? How can I assess student learning in such projects?
- What is the role of an audience for the project? Why is audience so important?
- What do teachers and students have to say about their experiences using PBL and technology?
- What do research and theory have to say about it? What resources are there for my continuing professional development in PBL?

Currently, PBL is spreading in popularity because many educators are beginning to realize how powerful it is for deeper learning.

Once you have gotten over the jitters about this kind of teaching (that usually happens about the time students begin to “buy into” the new way of learning), you can begin to enjoy yourself. No longer do you have to be the sole authority who knows it all—the subject, the learning steps they must go through, the technologies—now you can learn with your students and from them. It is a very liberating experience.

Instead of performing in front of a class or spending your energy keeping students quiet while they are supposed to be doing tasks that don't interest them, you now get to work with them, going on expeditions, exploring new ideas, and trying to figure out how the world works. You will, of course, have much more of a knowledge base than they do, particularly about how to learn and do research, but you can be part of this community of people involved and engaged in learning.

Evaluating and Critiquing the Projects.

As projects draw near completion, teachers typically have their students spend some time evaluating each other's work. Students learn a lot from this exercise, and they will be able to help you decide what counts as an excellent project and what makes a project just so-so.

Presenting the Works Created. Finally, students demonstrate their project to an audience of parents, another school group, or a civic organization, and they are able to answer questions about the content, process, and technologies used.

What about PBL in the Real World?

As I was writing this article, I read the May 16 issue of *USA Today* in which the 2002 All-USA High School Academic Teams were announced (Briggs, 2002). The thing that leaps off the page

when you see these remarkable students and descriptions of their work is the extent to which their excellence is based on their experiences using PBL. Here's a sampling of the 60 students named to the top three teams:

Aisha surveyed more than 1,000 teens and wrote *More Than a Label*, a self-help book for teens exploring social labels in high school.

Paul organized a cleanup of Erie Canal Lock 62, then researched the history of the lock, presenting the research at World Canals 2000 Conference and writing a brochure.

Michael has written and produced four musicals, two of which raised \$4,000 for Down syndrome groups.

Kavita has patents for her smart-lid safety sensor and her food packaging paper treated with fenugreek, an Indian herb extract that inhibits bacterial and fungal growth.

How Will It Work with My Students?

Don't panic! I don't mean to suggest that these are the sorts of projects you should expect to be doing in your class—at least not right away. Nor do I mean to say that only the brightest benefit from PBL.

On the contrary, students at every level of expertise, from all different backgrounds, and with differing learning preferences or “intelligences” can

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benefit from PBL. In fact, it is often reported that in terms of gains in understanding, students who need the most help also benefit the most from this type of collaborative, hands-on, authentic project.

If you are interested in finding new ways to challenge your students and get them really involved in their learning, try PBL. Think about a small project you might like to try, a pilot project that doesn't force you and your students to tackle too much all at once. In the next column, I'll talk about choosing a project topic and getting started.

Resources

Buck Institute for Education: www.bie.edu—

This site has many examples and resources.

Diane McGrath's PBL Web site: <http://coe.ksu.edu/PBL/>—This site expands on the

resources mentioned in the PBL columns, with annotations and further links.

George Lucas Educational Foundation: www.glef.org—This site has many examples and resources.

Project-Based Learning with Multimedia CD-ROM: www.wested.org/cs/wew/view/rs/608—This product is based on an award-winning Challenge 2000 grant project. After you are finished hearing three teachers' stories, seeing them work with their students, and learning about the seven important features of PBL emphasized in this project, you can use the CD to convince administrators, parents, and school boards of the potential of PBL for improved student learning.

What Kids Can Do: www.wkcd.org—This organization looks for stories of excellent student projects and accomplishments. These inspiring stories change from time to time, but they show the tremendous impact that authentic projects can have on the lives of the students.

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I feel a little odd using talking-to methods to help others learn more about PBL.



So I would like to hear from you about projects that you are trying, have done, or might consider doing. In this way, we might interact a little more, making this series of articles and the accompanying Web site a learning project for all of us.

Contact me at dmcgrath@ksu.edu or visit my PBL Web site (<http://coe.ksu.edu/PBL/>). See Resources on p. 44 for more on PBL.

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