Designing Worthwhile PBL Projects for High School Students, Part 2

by Eeva Reeder

Project–based learning has the potential to become one of the most useful and defensible instructional strategies of this age.

This is part two of a two–part article. Read part one.

When conceived and implemented as described, project–based learning has the power to foster persistence and mindful inquiry and bring about a more sophisticated understanding of concepts. It tends to develop mature skills and attitudes and more thoughtful work. With well–designed and well–delivered PBL, all ability levels can be appropriately challenged. Students will pay better attention in class, attend more regularly, perform at least as well on standardized tests (sometimes much better), and fail classes with far less frequency. Students will be happier because school makes more sense.

PBL has the potential to become one of the most useful and defensible instructional strategies of this age. Students who tune out in classes still focused on an information dump that needs to be memorized or on attainment of fluency with mechanical skills for which technology now exists are more and more drawn to online courses and other digital ways to get this knowledge more efficiently, often at their own pace, and often with a reduced quantity of mindless busywork. I believe most students would prefer to spend their time in school learning to apply some useful end the information and algorithms of the curriculum model that preceded the information–technology revolution.

Add to this trend that, more and more, schools are finding it difficult to refuse credit to students who have learned, for example, French or statistics in an alternative way and can produce evidence of competence. At some point, college and especially high school educators have to ask themselves why students should be required to sit in their courses when the same information (and course credit) is available elsewhere for less hassle, with more immediate or more personal feedback, and with less drag and interference from unmotivated peers.

PBL, on the other hand, offers students what they cannot find or arrange as readily elsewhere — opportunities to collaborate with peers and subject–matter experts on interesting projects, on making a difference in one's community, on learning valuable and transferable skills. PBL starts from the standpoint that information technology cannot and should not be ignored and gives digital natives a compelling reason to keep coming to school: to discover new knowledge. New knowledge is created by applying known information to unsolved problems, and, eventually, through new knowledge may even come wisdom.

When you get the hang of PBL, expect some unusual student behaviors. For example, they might solicit your feedback on drafts when they aren't required to. Their primary complaint might be, "We need a longer class period." Their first question when you introduce a new unit will likely be along the lines of "What problem do we get to solve this time?" instead of the exasperating queries "Why do I have to learn this?" or "When will I ever use it?"

Students will probably begin thanking you for all kinds of things: for respecting their intelligence and their desire to be self–directed, for example, and for giving them a chance to "try on" different careers and feel the difference in fit between being a transit planner and an oral historian and imagine themselves doing each type of work day after day.

Surprisingly, they thank you for letting them fail. My students frequently expressed gratitude for the chance to learn valuable lessons from their mistakes about project management, communication, procrastination, and so on when the stakes were relatively low, as compared with having to learn these lessons on the job as adults.
Once you've experienced the satisfaction of an entire classroom engaged in thinking hard without your prodding, it is difficult to
return to the old ways. Once you've witnessed average and low performers producing work you had no idea they had in them, it
is nearly impossible to go back. Once all your students can show you they've really grasped what you wanted them to learn by
what they've created, improved, or caused to happen, there simply is no going back.

**PBL–Appropriate Subjects**

In spite of all those benefits, it is important to understand that not all courses are equally well suited to a project–based
approach. Those least conducive are ones focused on skill acquisition, rules, and procedures. Reading, writing, world languages,
software applications, and physical education typically emphasize attainment of process fluency and factual recall. As a rule, so
do many visual arts and algebra–derived math classes.

In courses such as these, the best learning strategies frequently involve some form of direct instruction or demonstration
followed by learner practice or drill with immediate performance feedback, and less of the creative, open–ended problem
solving at the heart of PBL. This evaluation is not intended to diminish these subjects, because the knowledge gained therein is
necessary to the comprehension and application of complex concepts in other courses. My purpose in pointing out these
differences is simply to draw a useful line of distinction and acknowledge that teachers of skill–driven and fact–driven courses
probably will find it more challenging to come up with the type of problem scenarios described earlier.

Having said that, some good examples of authentic performance tasks in fact–dominated and skill–dominated courses are

- English–composition students writing and submitting proposals to potential sponsors to fund supplies and a field trip for
  their social studies class project.
- English students developing a booklet of American idioms and slang for the school's English–language–learner
  population.
- students of office–software applications developing a brochure and a multimedia slide show to be used by the school
  administration to market the school's magnet program.
- world–language students traveling to another country for a one–week or two–week home stay.
- world–language students engaging in a ten–minute one–on–one conversation with a native speaker as a final exam.
- art students designing playbills, school T–shirts, school logos, and a hallway mural in collaboration with a local artist.

A note about algebra: The transit project described in part one of this article was done in a first–year course. Although it was a
rich data–analysis task and was appropriate as an investigation of a central concept of algebra and precalculus in general, it was
not a specific application of one of the handful of basic data models studied in first–year algebra. Because of their very
elementary nature, only limited complex applications exist for them.

Teachers of concept–rich content should have an easier time coming up with project ideas and developing interesting, authentic
performance tasks than their colleagues in courses such as those described above. On the concept end of the curriculum
spectrum are all the sciences, physical and social, as well as literature, health, geometry, and statistics, among others. Behind
each of these disciplines is an ever–present question: "How do we know what we claim to know?" which drives the need to
teach one or more methods of inquiry.

Of course, this question is also behind algebra and art, but it often gets buried under the how–to emphasis. The more concept
heavy a course is, the better it is suited to PBL, because the development of concepts requires inquiry and investigation (versus
lecturing) — learners must necessarily take a new notion apart, compare and contrast it to related ones they already have, and
reassemble it for themselves. The problem solving at the heart of PBL invites this kind of mental activity.

Probably no course falls purely into either the fact/skill camp or the concept camp, but most tend to weigh more heavily one way
or the other. In reality, where an individual course falls on this continuum is greatly influenced by the teacher's depth of
knowledge and experience teaching the subject, as well as by his or her beliefs about what is most important to learn and what
students are capable of. Even the most concept–drenched, shades–of–gray subject can be kept at the surface level of recall and
rote skill. Math and history courses frequently are — unnecessarily.

**What It Takes**
Not only are various subjects differently suited to PBL, but teachers and administrators are as well. Not all are equally or adequately prepared to pull it off in terms of content knowledge, assessment skills, and necessary dispositions.

What does it take to build a schoolwide project–driven or performance–driven instructional program? It takes gutsy leadership and a staff with inventive energy. It takes a dogged commitment of building resources, both budget and time, and a staff willing to invest several years into focused curriculum and professional development. It takes a clarity of vision that sustains one's courage to stick with it when feeling the heat from parents, central administration, and others to prepare students for Advanced Placement and other standardized exams, for "the realities of college," which typically means more rote learning and memorization of innumerable facts.

One cannot dabble with PBL to good effect. In fact, poorly conceived and implemented projects haphazardly plunked into a traditional curriculum can leave students in a bad place, with precious time wasted and very little learning gains even of the superficial sort.

Like any demanding but worthwhile achievement, development of an individual teacher's ability to employ PBL effectively or creation of a schoolwide PBL instructional program takes time and stamina. It requires overcoming resistance and finding ways around obstacles. It needs thoughtful plans of action and evaluation, and a great deal of wisdom about pacing the change.

From the teacher's perspective, shifting to PBL or an applied–learning approach requires accomplishing several steps, including:

- learning to design projects that simultaneously deepen students' understanding of key course concepts, develop or refine key process skills, and produce valid evidence of competence; coaches who are themselves experienced practitioners of PBL can help the staff avoid reinventing the wheel and wasting valuable time and energy.
- taking responsibility for curriculum design, which is a creative and circular process; this means designing units backward from performance tasks, demands deep content knowledge, and often takes a year or more per course. (Many teachers welcome the help of content specialists with this aspect.)
- deciding how to convey or cover less information in a course in order to investigate the biggest ideas more deeply; this means making some hard decisions about what has to go.
- learning to identify deficiencies in necessary prior skills and knowledge and differentiate learning according to need; this means providing supportive scaffolding with projects where necessary while always avoiding doing students' thinking for them, no matter how students have been labeled.
- developing strategies for teaching or improving students' competence with abilities such as problem solving, information evaluation, teamwork, technology use, and oral or visual presentation.
- learning to manage a student–directed learning environment in which various students or groups of students are doing different things.
- finding and creating methods and means for evaluating students' products and performances in important but manageable ways.

**The Payoff**

No doubt you will encounter resistance to employing the project approach at the high school level, especially in upper–level academic courses. One of the toughest hurdles to clear is the fear that project work will not prepare students well for college. I assume these fears are held by those who have not witnessed the power of a well–designed and well–executed classroom–performance task to open wide the doors on new insights, ground young adults on a foundation of sound thinking habits, and engender the confidence that comes from successfully rising to a challenge.

PBL can be at least as intellectually rigorous as --- even more demanding than --- typical Advanced Placement courses. When learners have to apply abstract theories within the concrete, messy world, their grasp of underlying premises and principles is severely tested. The inevitable encounter with their misconceptions causes a struggle to truly own a concept in order to utilize it. This is the point at which learning happens --- not before.

Embedding workplace and community learning into core academic courses not only makes the learning measurably more meaningful but also demystifies the adult world and helps students make better decisions about what classes to take next and what training to pursue after high school. Creating authentic products that have to meet high external standards teaches young students to think deeply, to argue soundly, to work collaboratively, to implement and evaluate innovative strategies, and to make a real contribution to the community.
people more convincingly than a teacher's words or grades ever can about why written conventions matter, why presentation is critical, why we need disciplined methods of inquiry, why "facts" need to be scrutinized.

When a thoughtful project–based instructional program is established schoolwide, many other agreeable things happen: Teachers from various disciplines discover they are working to develop the same competencies and habits of mind, and students begin hearing the same messages from all their teachers.

This result often leads to the development of common rubrics for these competencies, which further underscores a universal performance expectation for students. (These rubrics can also make an excellent organizer for a senior portfolio.) Teachers begin to see a reason to reorder their units to better support each other's projects and seek ways to integrate their content and collaborate on projects.

Students become more animated at home about what they're learning in school. Parents and community members, acting as subject–matter experts and/or consumers of student products and performances, become natural partners in the education of a community’s youth. Through their collective project experiences leading up to their senior year, students become well prepared to carry out an independent senior project, and the quality of their projects begins to resemble what one would hope to see from those about to join the adult population. The quality of student work speaks more eloquently about the good things going on at the local high school than anything else can.

Best of all, the entire school takes on a palpable hum of productive effort; learning feels less forced and more about the joy of doing something useful. When we make things, when we create, we feel alive. No wonder students want to learn this way — and thank you for giving them the chance.

*This is part two of a two–part article. Read part one.*

**Eeva Reeder** (reedere@comcast.net) is a program consultant for small schools, an instructional coach, a workshop provider, and a speaker specializing in project–based learning and secondary math education.

**References**

What I share about project–based learning has its roots in the following works:


**The following Web sites appeared in this article:**