



Balancing Real-World Problems with Real-World Results

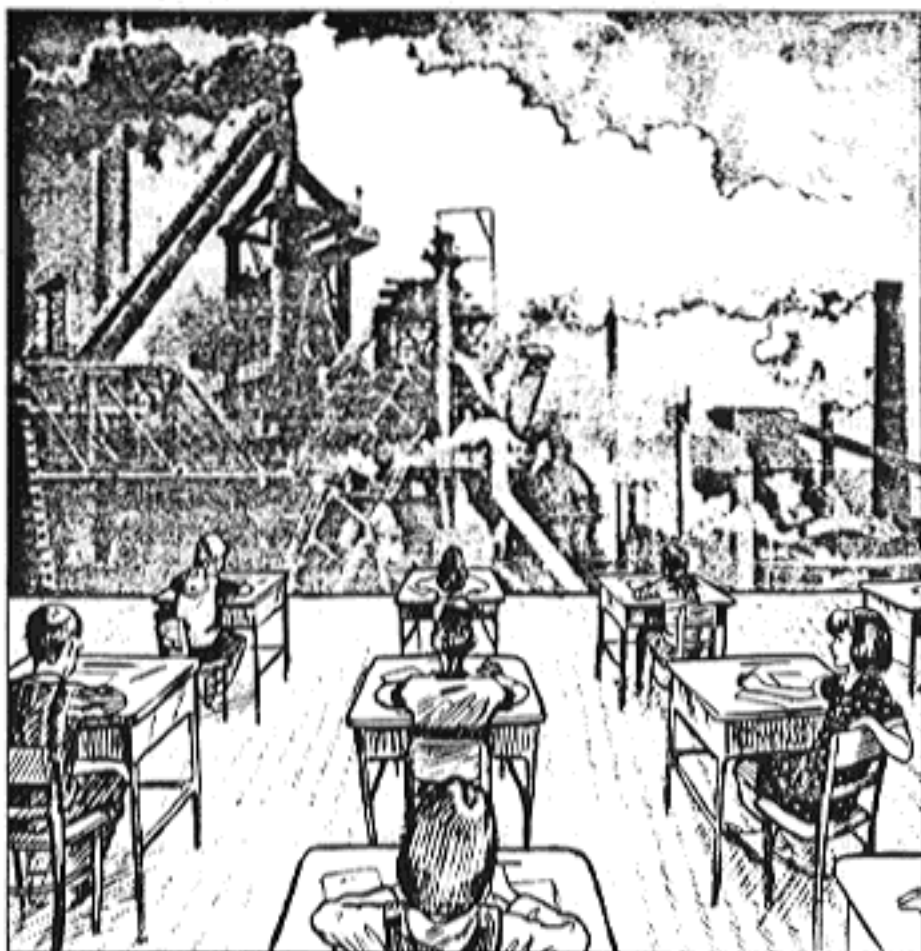
BY RICK GORDON

Enthusiasm for real-world learning needs to be balanced with the realities of real-world classrooms, Mr. Gordon notes. Through thoughtfully designed authentic learning experiences, students can develop the understandings, skills, and beliefs needed for success in school and beyond.

Mankind likes to think in terms of extreme opposites. It is given to formulating its beliefs in terms of *Either-Ors*, between which it recognizes no intermediate possibilities.¹

AUTHENTIC learning, real-world problems, constructivist classrooms, performance assessment. Engaging students in "authentic" performance situations seems to be the latest wave to wash over the schools. On the surface, this is a most appealing contrast to the decontextualized, rote learning typified by "traditional" education. As Jacqueline Brooks and Martin Brooks exclaim in describing the benefits of constructivist classrooms, "They free students from the dreariness of fact-driven curriculum and allow them to focus on large

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ideas; they place in students' hands the exhilarating power to follow trails of interests, to make connections, to reformulate ideas, and to reach unique conclusions."² Without doubt, the possibilities are great and the language lofty when addressing this latest wave.

As one who comes to this movement with long experience engaging students in real-world problems, I feel that it is important to warn against the all-too-familiar tendency in education to be enamored

with new ideas while losing sight of the grounded perspective needed to make things work in real classrooms with real students.

The program I work with, Education by Design/Critical Skills (EBD/CS), pioneered "Learning by Real Problems" in the early 1980s. Directed to come up with educational practices that would allow children to develop the knowledge and skills needed for success in school and beyond, EBD/CS originally focused exclusively on real-life problems. In six-week summer

institutes, teachers were engaged in real-world problems so that they could directly experience the power of this mode of learning. The response to this approach was consistent — participants found it to be among the most compelling learning experiences of their lives; they felt engaged, challenged, energized, and overwhelmed. It was this last factor that proved most problematic.

How Realistic Is Real?

Real-world problems, by their nature, are messy — involving uncertainty, complexity, and nuanced judgment.¹ These characteristics tend to clash with the norms that are prevalent in most schools. Real-world problems often don't mesh well with mandated curricula, textbooks, standardized tests, state standards, and the seven-period day. Teachers who actually tried using real-world problems with their students tended to be those renegades who thrive on change and risk-taking.

A more typical response of institute participants was that, while they found the summer experience invigorating, they were daunted by the prospect of attempting to implement this approach in their classrooms. Where would they find resources? How would they assess student work? What would parents and administrators say? Finally, there was the omnipresent concern about "covering" the curriculum and ensuring students' exposure to the content at the heart of a teacher's subject area. For many teachers, real-life problems, despite their promise, seemed incompatible with classroom realities.

Stepping Back to Step Forward

As a program, we have stepped back from this solitary focus on real-world problems to consider what are the essential elements of "authentic" learning. What is it about real-life problems that make them powerful and engaging, and how can this be re-created in an environment, such as the classroom itself, that often has relatively loose ties to the "real world"? Here is what we have found.

1. Authentic learning demands that students actively solve problems. Life involves an ongoing series of problems to solve, decisions to make, concepts to understand, and products to produce. Whether it's a relatively simple matter of deciding what to eat for breakfast or a more complex one

such as figuring out how to reduce pollution in one's community, in life we make decisions and do things that have concrete results. Very few of us do worksheets.

2. In authentic learning situations, people work together. There are not the artificial boundaries of what some call the "graveyard model of teaching" (everyone in rows and dead). Students move about, talk to one another, and are active both physically and mentally. They find resources to help solve problems — whether they be fellow students, books, or the Internet. The focus is not just on what you have stored inside your head but on what you can actually do to solve a problem using the resources around you.

3. Authentic learning situations simultaneously involve one's knowledge, skills, and attitudes. In real-life situations, you use your organizational skills to manage resources to make decisions about how to solve problems using the knowledge you possess to produce a result that meets your internalized sense of quality. Knowledge, skills, and attitudes are developed in the context of actual work.

4. Authentic learning is driven by "essential knowledge" that is meaningful to students. Not every element of student work must be "real," but meaning for students entails seeing connections to the real world on some level. This relevance is best ensured by tying student work to the "big" questions, what Ernest Boyer called the "human commonalities."² These questions get to the heart of our culture, history, and future as they relate to the human life cycle; our command of symbols; our understanding of the social web; our connection to science, technology, and the natural world; and the interdependence of community and the individual. Likewise, attention to real-life skills, such as decision making and problem solving, can link students' work to real-life experience.

5. In authentic learning environments, activities are connected. Knowledge, skills, and attitudes learned and employed in one context carry over to another. The curriculum looks less like a compilation of discrete building blocks and more like a continuous ascending spiral in which each experience builds on previous ones as students increase their understanding and improve their skills.

6. In authentic learning situations, students publicly exhibit their learning, and there are often real-life standards of quality. Authentic problems don't generate scores

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on a test. There is usually some authentic benchmark instead to which students are accountable. For example, if students make a proposal to the town council, the council responds and perhaps approves it. If students are making a product — such as a poster, play, or mural — there are models of excellence against which the product can be judged. Exhibiting one's work publicly places it up against these real-world standards of quality.

The purpose of listing these features of authentic learning experiences is to make clear that they are achievable in regular classroom settings. While it may be true that the most authentic context is the real world beyond the school-yard fence, there are reasonable approximations that can be created in the classroom to offer students the same level of engagement, meaning, and learning on a consistent basis.

Making Learning Authentic

The framework that guides the creation of authentic learning in all settings is the experiential learning cycle (ELC). This model offers an approach to make "smaller" learning activities more authentic and to make "messier" real-life problems more focused.

At the heart of the ELC are what we call challenges or problems to solve, which are driven by desired outcomes — what we want students to know, do, and be like (knowledge, skills, and attitudes). To help

Three Sample Activities

1. Academic Challenge: Middle School Social Studies

Introduction. The end of the 19th century was a time of great change in U.S. history. Many of the problems we faced then, we continue to face today. Some of the most significant movements of this era dealt with labor unions, farmers, women's rights, and social reform.

Product. Your challenge is to develop, as a class, a mural representing the major themes of this period and providing specific information that exemplifies these themes.

Process. Creating this mural requires skillful organization. To begin this project, form groups to investigate one of the topic areas cited in the introduction. After reading material appropriate to your topic, you should develop a list of five specific events that represent the *significant* problems or issues related to your topic.

You will then take this list and join with representatives of other groups to identify at least three common themes evident in all of these different topic areas. From these efforts, you will develop consensus as a class on common themes to be represented in the class mural.

When you have the common themes, you will return to your original topic group to create your piece of the mural. We will work together to establish quality standards for the mural. After sharing each group's work with the class, you will create a complete class mural, organizing this work into a cohesive whole. Upon completing the mural, you will be tested on your understanding of the various interests evident in the Reform Era and your ability to explain how these conflicting interests were resolved. As a final task, you will be expected to write several paragraphs in your journals on the Essential Question: How does society balance various, and at times opposing, interests?

2. Scenario Challenge: Middle School Science

Dear Students,

There is a proposed bond issue for renovations to the water treatment plant, and town officials feel the citizens of Hampton need to be better informed about the current water treatment facility, proposed changes, and the expected benefits and costs. Unfortunately, many people in Hampton are unfamiliar with the important work that our wastewater treatment department does. Town officials would like to hire a marketing firm to help educate voters in Hampton about this water treatment plant. Since you have been studying water pollution and its effects on our environment, I thought you would be well qualified to act as designers for this information campaign to educate Hampton's citizens.

Specifically, this information campaign should include:

1. A thorough explanation of how our wastewater treatment plant works.
2. Test results indicating the quality of water discharged from the plant.
3. An explanation of the conditions that are necessitating changes at our plant.
4. An explanation of how the plant could be improved to upgrade the quality of water discharged.
5. A cost comparison showing current costs and projected costs to upgrade the facility and how much these costs will affect the taxpayer.
6. A conclusion stating whether the benefits of improving the facility are worth the additional cost.

This information should be presented in a way that interests the voting public, is easily understandable, is eye-catching, and can reach a wide range of the community.

I think you are eminently qualified for this challenge. Good luck!

Your teacher,
Mr. Wheeler

3. Real-Life Problem: Interdisciplinary

As the elderly population in the United States increases and ages, there is a growing need for services to help make the lives of the elderly easier and more rewarding. Unfortunately, there are inadequate funds for aid to the elderly in our community. The challenge to this class is to plan, prepare, and implement a way for students your age to assist the elderly in this community. How we get from here to the delivery of this assistance is the problem for us to solve. What do the elderly in this community need, and what might you do to enhance their lives? This is a big challenge for you to undertake. I'll help in whatever ways you see as appropriate, but remember, this is your project. Good luck!

make challenges accessible to teachers and students, we categorize them on three levels of generally increasing authenticity, complexity, uncertainty, and student self-direction.

1. *Academic challenges.* These activities provide an entry point into authentic, problem-based learning. An academic challenge is student work structured as a problem arising directly from an area of study (see sidebar, part 1). It is used primarily to promote greater understanding of selected subject matter. The academic challenge is crafted by transforming existing curricular material into a problem format. Academic challenges tend to look fairly familiar to teachers and students accustomed to traditional educational environments. They serve as a useful access point for developing a capacity for actively constructing learning, working collaboratively, targeting specific outcomes, focusing on standards of quality, and grappling with essential questions.

2. *Scenario challenges.* These challenges cast students in real-life roles and ask them to perform these roles in the context of a reality-based or fictional scenario (see sidebar, part 2). The scenario challenge simulates many of the elements of the real world as a way of working with existing curricular material. Students begin to see themselves in real-life roles as they develop the knowledge and skills needed for success in school and beyond.

3. *Real-life problems.* These are actual problems in need of real solutions by real people or organizations (see sidebar, part 3). They involve students directly and deeply in the exploration of an area of study. And the solutions have the potential for actual implementation at the classroom, school, community, regional, national, or global level. Through real-life problems, students move outside the classroom, take action on issues, and have a tangible impact in their communities. These assignments can be powerful learning experiences, but pulling off more than one or two of them a year seems to be beyond the resources (energy, time, and money) of most teachers and schools.

Moreover, for students to succeed with real-life problems, it helps if they have experience working in collaborative problem-solving teams. The skills and attitudes of collaborative problem solving are best developed through coordinated work on problems of increasing complexity and uncertainty (such as academic and scenario

challenges).

The ELC includes both student and teacher dimensions. The student phases of the cycle are engagement, exhibition, and reflection. First, students are *engaged* in a problem that has been crafted by the teacher to target specific knowledge, skills, and attitudes. This challenge, as do many real-life problems, usually requires some concrete product as evidence of student learning. During the engagement phase, students and teachers spend time articulating standards, based on real-world models, for the quality of the product. In the course of engagement, and in the *exhibition* of this product, students demonstrate their learning. After completion and exhibition of their products, the students are not "done" with their learning. Students participate in the *reflection* phase, in which they examine their work and reflect on what they have learned (reinforcing and constructing knowledge and considering their personal and interpersonal behaviors). Students may then join the teacher in assessment of their work based on their pre-established standards of quality.

The teacher-led phases of the cycle are design, coaching, and feedback. Once the students have begun work on the problem that has been carefully *designed* by the teacher to target specific knowledge, skills, and attitudes, the teacher assumes the role of *coach*. As coach, he or she helps students to develop their skills and knowledge, shape their strategies, and find appropriate resources. Like a coach, however, the teacher remains on the sidelines at times, allowing students to own their successes and failures. Here, the students are truly the workers, and the quality of their work reflects their efforts. In the *feedback* phase, teachers create structures within which students can reflect on and assess their products, processes, and level of understanding.

Finally, this learning experience is connected to subsequent experiences as students move into the housekeeping phase, in which they consider what they learned and what they need in order to proceed. They articulate what they might do better next time and address skills and knowledge they need to develop further as they move on to other challenges. Notably, they also give consideration to the status and needs of their learning community. They address issues that arose during their work and develop strategies for future work to improve the learning of their community.

In short, the classroom is structured so that students are given a meaningful context for interdependent work throughout the learning cycle. Purposes and processes are made explicit, and students understand what they are doing, why they are doing it, and how it relates to work in school and outside. Experiences are organized to build on one another, so that, as we do in the real world, students can learn from their successes and failures and carry these lessons with them to their future work. Most important, the work of the classroom consistently demands that students authentically exhibit their knowledge, skills, and attitudes throughout the learning cycle instead of only during a scheduled performance.

Bridging School And the Real World

Authentic learning is a laudable goal that should be promoted and pursued vigorously. Students not only *should* see their work in school related to the real world but *must* see it that way, if they are to be able to apply their learning in real-life contexts. As we pursue this goal, however, our experience warns us to remain grounded in the realities of teachers' and students' school lives. Working with real-life problems is a sophisticated process that demands refined skills and a tolerance for ambiguity and complexity. While only some teachers and students have an innate capacity for such undertakings, almost all teachers and students can develop such capacity. Designing challenges to develop the understandings, skills, and beliefs necessary to be successful with real-life problems involves a commitment to authentic learning experiences of increasing sophistication. The experiential learning cycle and the combination of academic, scenario, and real-life challenges provides a blueprint to connect the vision of real-world learning to the realization of authentic student results.

1. John Dewey, *Experience and Education* (New York: Collier, 1938), p. 17.

2. Jacqueline Grennon Brooks and Martin Brooks, *The Case for Constructivist Classrooms* (Alexandria, Va.: Association for Supervision and Curriculum Development, 1993), p. 22.

3. Lauren Resnick, cited in Grant Wiggins, *Assessing Student Performance* (San Francisco: Jossey-Bass, 1993), p. 215.

4. Ernest Boyer, keynote address to the annual meeting of the Association for Supervision and Curriculum Development, Washington, D.C., 1993. ■