

How PBL Teachers Set the Stage for Sticky Learning

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6-7 minutes

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Challenging concepts and unfamiliar vocabulary come with the territory in a course like high school chemistry. If students' only goal is to pass tests that emphasize memorization, they may quickly forget about stoichiometry or atomic structure. But if they can make an emotional connection to the content, they're more likely to dig in and apply what they learn.

That's the experience of veteran teacher Ray Ahmed, who teaches at Leaders High School in Brooklyn, NY. He designs chemistry projects that connect to students' lives and interests, such as the safety of their drinking water. A unit that focused on chemical compounds, for example, began with students studying the water crisis in Flint, Michigan. They recognized parallels to health risks facing their own families and neighborhoods. "Environmental racism is something that plagues the community that our kids are from," the teacher explained. The water quality project gave his students an opportunity to tackle injustice with science.

By the end of the project, students had designed their own experiments about corrosive inhibitors that prevent lead from leaching into drinking water, used statistical methods to analyze data on water quality, consulted with expert statisticians, and submitted their conclusions to a professional journal. They hadn't studied chemistry only in the abstract; they became chemists who could apply their knowledge to a real-world context.

Ahmed is one of many inspiring teachers we interviewed for *Project Based Teaching: How to Create Rigorous and Engaging Learning Experiences*, to be published by ASCD this fall. He is also featured in a new video series about project-based learning (PBL), produced by the Buck Institute for Education. (See the water quality project video, below.)

Hearts First

Across grade levels and content areas, experienced PBL teachers consistently emphasize the importance of engagement as one critical factor in making learning memorable.

Oklahoma math teacher Telannia Norfar, for example, said her strategy when introducing projects is to "capture the kids' hearts so that their minds will follow." For example, to engage her high school students in a PBL unit on exponential equations, she connected

them with real clients who wanted help with financial planning.

PBL teachers employ a range of tools and strategies to foster engagement. Like Ahmed, they may design projects that address students' interests and concerns, as well as real-world problems. A teacher's own passion for a project can also generate interest, engaging students in a topic they didn't know they cared about. Successful PBL teachers attend to engagement throughout a project by encouraging students to set and track specific goals, ask questions, make choices, and work toward excellence as defined by a rubric or exemplars. Teachers can use the Buck Institute for Education's [Project Based Teaching Rubric](#) to assess their own skills as facilitators of student-centered learning.

Learning by Doing

Application of knowledge is baked into PBL. As part of the learning experience, students apply their understanding to propose a solution, create an original product, or perhaps teach others. Sharing their results with an authentic audience is another driver of student engagement.

The insights we gathered from dozens of PBL classrooms also reflect what researchers report about learning experiences that emphasize application of content. Several studies have shown that students who learn through PBL remember the information longer than those taught using more traditional methods (Larmer, Mergendoller, & Boss, 2015).

Students themselves acknowledge the "sticky learning" that comes with PBL. Here's how a student from City Arts and Tech, a San Francisco high school that emphasizes PBL, described her learning experience in a [recent attn: video interview](#): "Even after this project is done, I know it will stick with me because it was not memorizing. It was learning something and just going so much more in-depth."

Research supports this student's assessment of learning that sticks. In a [recent study](#) of schools that emphasize deeper learning, researchers at the American Institute of Research (AIR) found a correlation between deeper learning practices and positive student outcomes. For example, schools using deeper learning methods had higher rates of on-time graduation and students who exhibited deeper learning competencies—skills and habits like collaboration, communication, complex problem solving, and academic mindsets. In these schools, students master core content knowledge and build skills to communicate their ideas, think creatively, work collaboratively, and manage their own learning. Not surprisingly, PBL is a common instructional practice in most of the schools where students are experiencing deeper learning.

PBL gives students a real reason to learn new content and skills. Students are not just going through the motions of temporarily reciting facts or procedures to be forgotten as soon as the textbook turns to the next unit. With effective PBL, students must use their knowledge—and each other—to solve problems that matter. When learning is meaningful, it is memorable by design.

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