Defined

WHITE PAPER

Career-Connected PBL

Project-based learning grounded in authentic career scenarios is an effective approach for both general and career education

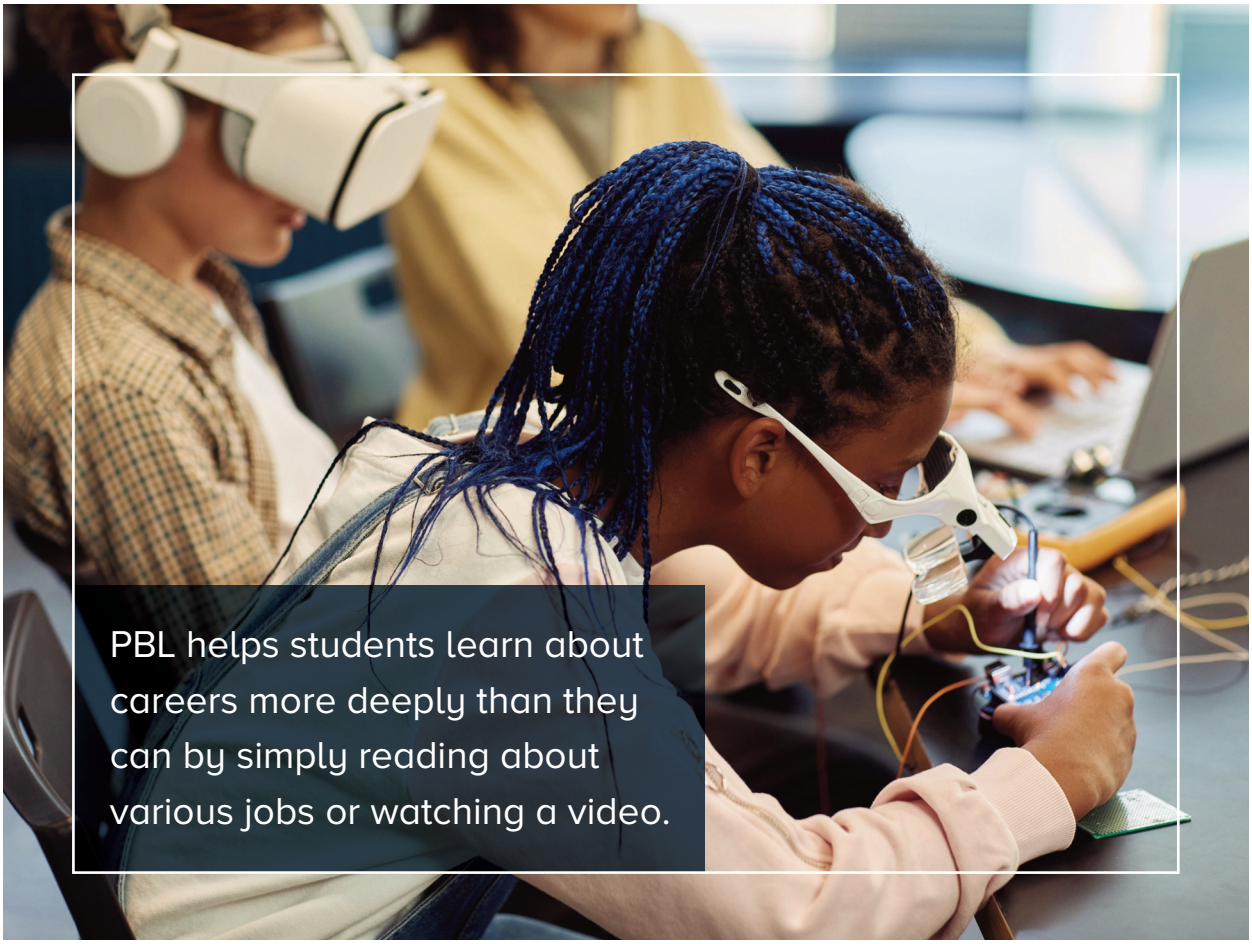
eSCHOOL NEWS

Project-based learning (PBL) is an instructional strategy in which students learn by actively engaging in large-scale projects that have real-world relevance. Numerous studies have shown that PBL can lead to deeper learning, higher levels of engagement, and better student outcomes when implemented skillfully.[1]

In fact, PBL is a particularly effective strategy for teaching students about future careers. This includes instruction within career and technical education (CTE) programs, as well as general education in core subjects such as math and science.

Whether educators are encouraging students to think about their future by exposing them to various career options, teaching students career skills that will prepare them for success after high school, or simply showing students how core content applies within the real world, PBL helps students learn about careers more deeply than they can by simply reading about various jobs or watching a video.

By assuming specific job roles for themselves and completing hands-on tasks that professionals in that field might do as part of their day-to-day responsibilities, students get a much richer sense of what it's like to work in that field and the skills required for success.



Helping Students Think About Their Future

Sharon James, Executive Director of Secondary Education for the Broken Arrow Public Schools in Oklahoma, compares the process of exploring careers in school to riding a train.

"Students don't necessarily choose a single pathway for the rest of their lives," James notes. "They're frequently hopping on and off various pathways as they learn about what each one involves."

Engaging in authentic, career-related projects allows students to see for themselves whether they like a particular career or not. "Someone might be interested in a nursing career and then feel light-headed when they have to draw blood for the first time," James says. Having that hands-on experience helps students choose an appropriate career pathway that truly resonates with them.

Career education plays a prominent role within Broken Arrow, a suburban school district southeast of Tulsa serving more than 20,000 students. Through a partnership with Tulsa Technology Center, juniors and seniors can attend career-related classes at the center's campus. In addition, Broken Arrow offers its own CTE courses for students in grades 9-12 in pathways such as family and consumer science, pre-engineering, manufacturing, and agriculture.

Each pathway includes four courses and culminates with a capstone project. If students complete every course and the capstone project, they can earn industry licensing and certification. More than a quarter of the district's high school students take at least one CTE course before graduating, James says—and about 300 students completed a CTE pathway during the 2021-22 school year.

Like other Oklahoma districts, Broken Arrow encourages students to develop an Individual Career Academic Plan (ICAP) through a multiyear process that guides students as they explore career and postsecondary opportunities. In Broken Arrow, this process starts in the sixth grade and is revisited each year until students graduate.

Broken Arrow uses Defined Careers™, a K-12 career experience product from Defined, to jumpstart this career exploration process. Students begin by taking a multidimensional assessment of their interests, study preferences, and values. Based on their responses, the system matches them with a personalized list of possible career choices.

Students then have an opportunity to explore the careers on their list through online content and hands-on projects covering more than 500 careers

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across 79 career pathways. A project for the Commercial and Industrial Designer course within the Visual Arts pathway, for example, has students pretend they work as designers for Dick's Sporting Goods and challenges them to create a sketch and a prototype of a new tent that would appeals to kids.

"Research has shown us that students should have a general idea of what they want to do for a career by the end of eighth grade," James observes. "We need to start immersing students in career exploration at an early age and allow them to explore careers more often. Defined Careers helps us do that without putting the bulk of the hard work on our teachers or counselors."

She adds: "I love that the projects are connected to actual scenarios that students would encounter in those jobs. If students are creating and doing, that's a higher level of learning. They'll understand and remember much better, and it's so much more engaging for students."

At the end of each school year, students reflect on their career-based experiences. If they've found a career path they love, they can choose to explore it more deeply with full CTE courses if these courses are available within their area of interest—and if not, they can at least enroll in classes that will prepare them to study that field in college. If they haven't found a suitable career path yet, they can investigate additional pathways using Defined Careers the following year.

Having students think about careers in middle school puts them on an early path toward success.

"I want them selecting classes they want to take, not ones they're made to take, so their education has relevance and purpose," James says. "This benefits not just our students, but our teachers as well: They're getting kids in their classes who want to be there to learn."

Connecting Content and Careers

Helping students choose a career pathway they're excited about is one application of career-focused PBL. Another application is helping students understand how the content they're learning relates to real-world success.

In the Grand Prairie Independent School District in Texas, the science, technology, engineering, and math (STEM) and CTE departments have teamed up to integrate career-based experiences within STEM classes at all levels of instruction.

When Kasie Roden became director of STEM education for the district in 2019, she immediately approached the CTE department and suggested they work together. Connecting STEM content with careers is a best practice for engaging students, Roden explains, adding: "We're helping kids understand: Why am I learning this?"

Aniska Douglas, Executive Director of CTE, didn't need much convincing to partner with the STEM department. "Organically, STEM is a part of CTE and vice versa," she says. "There is much more to be explored when we join together."

A science lesson on reflection and refraction might include a field trip to a Lockheed Martin facility, for example, where students learn applications of these concepts within the aerospace industry—culminating in a project in which students are tasked with designing and building reflective lenses for the company.

"Our definition of STEM education includes a focus on hands-on teaching and learning," Roden explains. "We believe that students learn content much more deeply by actually experiencing it for themselves."

To help STEM teachers integrate high-quality projects that are based on authentic career scenarios, Grand Prairie uses Defined Learning. This supplemental PBL resource from Defined is an online library containing more than 600 customizable, standards-aligned performance tasks, as well as resources for guiding student research, editable rubrics for assessing students' work, and an online portfolio for students to showcase their work.

By taking a project-based approach to learning STEM content in the context of actual career scenarios, "our students are more engaged in their learning," Roden says. "And they're getting better learning experiences that lead to a more comprehensive understanding of the content."

Like Broken Arrow, Grand Prairie also uses the Defined Careers solution to help students narrow their career interests beginning in the sixth grade. Grand Prairie students who are interested in CTE instruction can choose from more than 30 career-based programs that lead to industry certifications.

Roden and Douglas work closely together to ensure there is synergy between the district's STEM and CTE departments.

"We plan team meetings together at the beginning of the year, and we meet regularly to align our ideas and discuss how we can best support each other," Roden says. "We both have the same goal in mind—to build high-quality learning experiences for our students. When you're working toward the same goal, it results in a strong and effective partnership."

Six Key Elements of High-Quality PBL

Research confirms that PBL can be a highly motivating and effective learning strategy when it's done well. But what does that mean? To encourage successful implementation, PBL expert John Larmer has identified these six key elements of what he calls "High-Quality PBL."

- **Intellectual challenge and accomplishment:** Students learn deeply, think critically, and strive for excellence. Teachers can achieve this outcome by introducing projects using an inquiry-based approach to learning; choosing products that require critical thinking, then explicitly teaching this skill; using rubrics and models to define and demonstrate high-quality work; and including cycles of critique and revision.

- **Authenticity:** Students work on projects that are meaningful and relevant to their culture, their lives, and their future. Teachers can achieve this outcome by connecting tasks to students' personal interests and concerns; involving outside experts; and finding local contexts and connections for projects.

- **A public product:** Students' work is publicly displayed, discussed, and critiqued. Teachers can achieve this outcome by finding real-world stakeholders for whom projects are created, and/or bringing in outside experts or other audiences for students to present their projects to.

- **Collaboration:** Students collaborate with their peers in person or online while receiving guidance from adult mentors and experts. Teachers can achieve this outcome by requiring students to work in teams and explicitly teaching collaboration as a skill.

- **Project management:** Students use an organized process that allows them to proceed effectively from project initiation to completion. Teachers can achieve this outcome by having students use project management tools and explicitly teaching project management as a skill.

- **Reflection:** Students reflect on the learning, the effectiveness of their project, the quality of their work, obstacles that arise, and strategies for overcoming them. Teachers can achieve this outcome by encouraging students to reflect at key milestones using a structured reflection process complete with prompts.

The Case for PBL

A modern education "should focus on students' capacity to transfer their learning by applying it to new situations," says author, consultant, and veteran educator Jay McTighe.

This transference requires more than just rote learning, McTighe says: "Rote learning only allows you to repeat back what you've been told. To transfer knowledge, you have to have a deeper understanding of both concepts and processes—and you need to be able to see when and where those apply."

PBL has been proven to be successful in developing this understanding. Projects that are based on authentic career scenarios help students see the relevance of what they're learning in core subject areas. They also help students experience what various careers are like for themselves.

For these reasons, career-connected PBL is a highly effective strategy within general education and CTE alike—and Defined offers solutions that cater to both.

To learn more, visit https://definedlearning.com/what-we-offer/defined-careers.

About Defined

Defined empowers educators to engage their students in high-quality project-Based Learning (PBL) that builds future-ready skills. Through our Defined Learning and Defined Careers solutions, we provide teachers with the essential project design elements they need to implement high-quality PBL; standards-aligned projects, real-world videos, hands-on experiences, and more. With Defined Academy, we offer skill-building professional learning courses to help teachers get started and go further with PBL. Defined helps teachers bring the real world to the classroom and empowers students to build critical future-ready skills.

To learn more, visit www.definedlearning.com.

[1] For an overview of nearly three decades' worth of research on the effectiveness of PBL, see Larmer, J., Mergendoller, J., and Boss, S. (2015). *Setting the Standard for Project Based Learning : A Proven Approach to Rigorous Classroom Instruction.* Alexandria, VA: ASCD. http://www.ascd.org/Publications/Books/Overview/Setting-the-Standard-for-Project-Based-Learning.aspx