



5 Characteristics of Rigorous Project-Based Curricula

Four newly released, peer-reviewed research studies show that rigorous project-based learning (PBL) has a strong, positive impact on student outcomes. Researchers from major U.S. universities in collaboration with K-12 teachers from around the country conducted the studies. They examined the impact of high-quality PBL curricula and aligned teacher supports on achievement and other measures of student success. The researchers found rigorous PBL improved outcomes for elementary, middle, and high-school students. The four PBL courses that the researchers studied cover different subjects and grades and vary in their approaches. However, they share common features, which are described below.

Projects are central

Rigorous PBL puts projects at the center of teaching and learning. Students work on projects throughout the year in a cohesive way. Each project builds on the learning that came before it and is closely tied to academic standards and learning goals. Projects aren't a side activity. They give purpose to the knowledge and skill building that occurs throughout the course.

So, for example, in the Knowledge in Action curriculum (KIA), which embeds PBL into Advanced Placement (AP) courses, students work on projects organized around driving questions

aligned to the AP curricular framework for each class. In one project in the [KIA AP Environmental Science course](#), students exploring environmental sustainability answer the question, "How can my family reduce our ecological footprint?" They calculate their ecological footprint and investigate the impact of their families' consumption habits.

Projects are authentic

The PBL programs examined in the four research studies empower students to seek answers to questions and solutions to problems they care about and that impact their community and the world. In [Multiple Literacies in Project-Based Learning](#), a third-grade science course, the project connects to the need for fresh food in the students' communities and has the students plan a garden. They study plants, their life cycles, and weather and use that information to design and present a plan for their school garden.

In rigorous PBL, students use the practices and methods of particular disciplines and fields and share their work with authentic audiences. In one project in the [Project PLACE curriculum](#), a social studies and literacy course, students learn about civics by engaging in a project focused on improving a local park, reading about the role of government and civic leaders, and then presenting their ideas to local government officials.



Engagement drives agency

Students are motivated when they are empowered to play an active role in their learning and apply what they know toward solving authentic problems. Key approaches to PBL that can further boost engagement include providing students with choice and creativity in how they learn, using meaningful driving questions, and asking students to immerse themselves in learning experiences. In the [KIA AP U.S. Government and Politics course](#), for example, students take on roles as Supreme Court justices and as delegates to the Constitutional Convention. In taking on these roles, students engage deeply and reflect on the role of governing bodies and the courts in society, sparking curiosity and a desire to learn more.

Students receive ongoing feedback

In project-based approaches, students reflect on and get feedback on their work throughout the course. Learning is visible, giving students and teachers opportunities to assess for understanding and track their progress. In [Learning Through Performance](#) (LTP), a sixth-grade science PBL course, students design a device that controls thermal energy transfer, such as a solar oven to bake cookies. As groups draw models of their devices, their teacher and peers give feedback and groups use that to improve their models and deepen their conceptual understanding.

Collaboration is key

Rigorous project-based learning also gives students multiple opportunities to collaborate with peers in meaningful ways and be part of a community of learners in which students and teachers build upon each other's ideas. Collaborating effectively is an important skill that can and should be explicitly taught and embedded in project-based courses. In Learning Through Performance, for example, teachers work with students on skill-building tasks at the start of the year, so they can effectively engage in productive groupwork going forward.

Looking ahead

Learning from research and relying on what works is essential. There is no one, single approach to education that works best all the time, but the four newly released studies show rigorous, well-designed PBL is an effective way to improve teaching and learning. Classroom teachers helped develop the PBL curricula at the center of these studies. Teachers who implemented the curricula with their students were supported with strong, aligned professional learning opportunities. Those developing new PBL resources should take this into account as they look to create new curricula. For more on PBL, and a closer look at the studies mentioned, please visit <https://lucasedresearch.org/research/research-briefs>.