



RESEARCH BRIEF

# Rigorous Project-Based Learning is a Powerful Lever for Improving Equity

**The disruption to the U.S. education system caused by the pandemic and the urgent and ongoing national conversation around systemic racism in America have shined a spotlight on inequity in our schools.**

Persistent disparities in opportunities to learn between students from different socioeconomic, racial, and ethnic backgrounds serve as stark reminders that our schools, which reflect what is happening in society, are not meeting the needs of all youth equally well. Furthermore, inequitable approaches to funding and resource allocation in education have led to opportunity gaps related to career and college pathways, curricular offerings, and access to rigorous and engaging student-centered approaches like project-based learning (PBL).



New research shows that when schools do provide the chance for underserved students to engage in high-quality PBL, significant learning occurs. Four studies released this year by Lucas Education Research (LER) and academics from universities around the country provide strong evidence that rigorous PBL improves student outcomes across racial and socio-economic backgrounds and reading and language-proficiency levels. Highlights of the [research](#) (LER, 2021) include:

- High school students engaged in project-based learning in Advance Placement US Government and Politics and Environmental Science courses outperformed students in traditional classrooms on AP exams. The effect held for students from lower-income and higher-income households. Notably, a higher proportion of students in the study were from low-income households than is typical for AP test takers.
- Students participating in a PBL middle-school science program in high-poverty, diverse schools, outperformed peers receiving traditional science instruction on science, math and English assessments. English learners in the PBL course, outperformed peers on a language proficiency test.
- Third-grade students participating in a PBL science course did better on a science



assessment than students in non-PBL classes. The assessment was aligned with Next Generation Science Standards and included items from state assessments. The positive impact of the PBL course on achievement held across racial and ethnic groups and socio-economic levels and regardless of reading ability level, meaning struggling readers in the PBL class outperformed struggling readers in the traditional class.

- Second-grade students in low-income, low-performing schools made five to six more months of learning gains in social studies with PBL instruction and two to three more months of gains in informational reading for the year as compared to peers.

The studies dispel the misguided belief that disadvantaged students aren't ready for student-led forms of instruction like PBL and must first master basic content through more traditional methods, like direct instruction. PBL is a student-centered, inquiry-based form of instruction in which students explore real-world problems that matter to them through individual and group projects. With high-quality project-based learning, direct instruction led by the teacher can be used to support student-directed learning when appropriate. Projects involve complex tasks, often organized around a challenging central question, resulting in reflection, revision, collaboration, and



the creation of a final public product shared with an authentic audience. Designing PBL with explicit attention to these characteristics can further the potential of PBL to engage and support learners from all types of backgrounds.

LER has released a detailed paper, “Equity-Centered Project-Based Learning,” exploring how well-designed and well-implemented project-based learning can provide opportunities for deeper learning for all students, addressing inequity in schools. This brief seeks to summarize that paper and related research.

## Access to rigorous PBL

There is significant evidence that active, student-centered forms of instruction, such as PBL, are better at producing deeper learning in students. However, some students are less likely to have access to those learning experiences. In the report, “[The Opportunity Myth](#),” TNTP demonstrated that students from low-income backgrounds, students of color, and English language learners were less likely than others to experience approaches that were deeply engaging, asked enough of them, and developed student ownership of their learning (TNTP, 2018).

John King, the former U.S. Secretary of education and current CEO of The Education Trust, describes the problem this way:

*“Sometimes folks look at low-income students, students of color, English learners, students with disabilities and say to themselves, ‘Because they are behind in some way academically, I’m going to make a very drill-focused, sort of minimalist curriculum.’ And that is exactly backward. The way that we’re going to accelerate the students who most need support is through rigorous, engaging learning experiences like project-based learning when it’s done well.”*

As a result of this lack of access to rigorous project-based learning and other high-quality forms of student-centered instruction, underserved students miss out on the opportunity to deeply engage with, collaborate and reflect on, and revise their understanding of related academic content knowledge and social and emotional learning (SEL).



## Authentic experiences

One of the principles of rigorous PBL that drives equitable learning experiences is the emphasis on authentic learning contexts, meaning learning experiences should be authentic to students' identities, interests, and communities. In high-quality PBL classrooms, the perspectives and lives of students are integral to the activities taking place. Projects relate to the communities in which young people reside and the broader world around them. For example, projects might explore how to design a neighborhood park to support local plant life, build more affordable housing, or solve a pressing public-health problem.

---

## The studies dispel the misguided belief that disadvantaged students aren't ready for student-led forms of instruction like PBL.

---

By integrating academic content with authentic student interests, PBL deepens student motivation and engagement. The middle-school science study, led by Stanford University researchers, found that students who used a PBL curriculum had higher levels of engagement than their peers in traditional science classrooms. The PBL students reported that their classroom assignments were more interesting, challenging, worthwhile, and enjoyable as compared with reports from the comparison group.

To ensure project-based learning is authentic to students and equity-focused, it should include culturally relevant practices—incorporating the assets students bring to the school community and ensuring learning experiences are relevant to them. University of Wisconsin researcher Emily Miller explained that curricula should be culturally sustaining and affirming and connect projects to students' lives, for example through thoughtful, equity-centered prompts and other instructional methods. Any curriculum used should also be flexible enough for teachers to pull in additional resources to help students connect to the work at hand. Miller studied the third-grade science curriculum, in which students were asked to design a

garden to grow food in their own community. She noted that students in the Detroit area watched a video featuring Ron Finley, who transformed an urban community not unlike theirs through community gardening. And, during a project in which students designed toys, the children learned about Lonnie Johnson, a Black engineer who invented the Super Soaker and created many iterations of the toy before landing on the ultimate design. Ensuring projects and resources are relevant to students enhances the rigor of PBL, deepens engagement, supports identity development, and increases the likelihood of learning gains.

## Belonging in a school community

PBL and equity-centered instruction require establishing meaningful relationships in which all students feel safe to contribute, collaborate, hear feedback and take intellectual risks. For PBL to succeed, and drive equity in positive ways, it is essential for students to feel a sense of belonging and feel that their contributions are making a difference.

Seattle high school history teacher Jerry Neufeld-Kaiser, who has used the AP U.S. Government and Politics PBL curriculum, said that ensuring all voices are heard is central to PBL, just as it is in equity-focused instruction generally. He elaborated,

*"This project approach gives you a chance to engage the students who might otherwise sit and hide and keep a low profile and not do well. Projects make their performance clearer to see, and their success shows more clearly."*

Developers of the sixth-grade PBL science curriculum explicitly focused on building a sense of community among students and supporting equitable participation practices within the design of the curriculum. At the start of the year, teachers work to model interaction and language practices that allow all students to participate equitably in group work and collaborate productively.

Family engagement is also critical to both high-quality PBL and all equity-centered instruction. Community knowledge strengthens PBL instruction and equitable academic experiences.



In high-quality PBL, family and communities are considered important contexts for learning and youth development.

## Asset-based teaching

Teachers must work to embrace asset-based teaching and interrupt deficit thinking based on negative stereotypes and assumptions that limit what is possible for some students. For example, researchers engaged teachers using the third-grade PBL science curriculum in open and honest conversations about educational equity. The group of academics and practitioners examined widely used models of instruction rooted in deficit views that involved testing and assigning levels to groups of students and discussed alternative approaches. Having these conversations disrupted the use of the deficit-based approaches and supported the use of more-equitable, asset-based practices.

Lead researcher Joseph Krajcik, of Michigan State University, who led the design of the PBL program, known as Multiple Literacies in Project-Based Learning, said curriculum designers, like teachers, must engage in asset-based thinking and planning.

*“Our focus is on supporting all learners in developing deep knowledge and tools for understanding their world. As such, ML-PBL’s focus on equity was purposefully designed as a major component of our intervention. We examined a series of conditions that support science learning for children, including those who are non-English speakers, those who have special needs, struggling readers, and those in classrooms with limited access to science materials and resources.”*

## Aspects of social and emotional learning

It is fairly well understood that PBL encourages the development of certain social and emotional learning skills, such as the ability to work with others, problem solve, make good decisions, and communicate effectively. The recent studies released by LER support the position that rigorous PBL improves teaching and learning in this area. For example, the middle school science study found that teachers using the curriculum improved at facilitating student group work. Researchers with the nonprofit American Institutes for Research previously released a [study](#) suggesting collaborative experiences as among the factors that can





contribute to positive changes in the academic trajectories of Black students (Surr et al., 2018).

In addition, the third-grade science study found that PBL students more frequently reported the value of reflection and collaboration in science classrooms than a comparison group.

Integral to PBL is the value it places on student ownership over learning and the development of student expertise and agency as a resource for learning, something that is also important in equity-centered instruction generally. In a [case study](#) examining the third-grade PBL science program, researcher Miranda Fitzgerald of the University of North Carolina-Charlotte, found that students engaging in PBL had the opportunity to assume ownership over their work by connecting their learning to their community, acting as problem solvers, making choices, and developing a sense of belonging within the discipline of science (Fitzgerald, 2020).

## Looking ahead

As we work to make schools more equity centered, an area of focus must be toward developing and implementing more culturally responsive, sustaining, and affirming curricular resources. This must include support for educators and administrators leading any review and adaptation of existing resources, with those characteristics in mind, and the adoption of new programs.

It is important to note that all of the PBL programs highlighted in the LER studies include strong professional learning opportunities for teachers. Educators benefit when they have sustained, high-quality professional learning to support them in implementing project-based learning and equity-centered instruction. For PBL to improve equity, educators need to engage in professional learning experiences that are built on trust, led by expert facilitators, adaptable for local contexts, and emphasize teacher practices that improve outcomes for students of different backgrounds. Teachers need support in learning how to teach with PBL methods, and principals need support in learning how to develop and empower teachers to lead high-quality PBL classrooms.

A team of researchers convened by LER identified several conditions that support rigorous project-based learning and its growth. They found



strong professional learning opportunities are critical to PBL uptake, as are conditions that empower teachers to make teaching and learning decisions that affect positive change. LER continues to invest in research into equity-centered instruction, including supporting and facilitating learning across research projects and contexts. This includes sponsoring a multi-institution collaborative research effort that got under way in 2021.

U.S. schools are at a crossroads, experiencing great disruption and a renewed focus on inequities that have festered for far too long. Urgent change is needed, and the evidence is clear that well-designed approaches to project-based learning can help build a more just, fair, and effective education system—one that delivers on the promise of providing all children with the strong foundation they need to achieve success and live out their dreams.

## REFERENCES

Cheng, B., H., Clark, T. L., Allen, C. D., Garcia, A. G. & Scipio, D. (2021). Equity-Centered Project-Based Learning [White paper].

Fitzgerald, M. (2020). Overlapping opportunities for social-emotional and literacy learning in elementary-grade project-based instruction. *American Journal of Education*, 126(4), 573-601.

Lucas Education Research (2021). Retrieved from: <https://www.lucasedresearch.org/research/research-briefs/>

Surr, W., Zeiser, K. L., Briggs, O., & Kendziora, K. T. (2018). Learning with others: A study exploring the relationship between collaboration, personalization, and equity. American Institutes of Research.

TNTP (2018) Retrieved from: <https://tntp.org/publications/view/student-experiences/the-opportunity-myth>