

Rigorous
Project-
Based
Learning
An Inquiry-
Based
Educational
Approach



Photo: Deeper Learning

Equity-Centered Project-Based Learning



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When students' perspectives are valued and recognized as important contributions to classwork, students come to understand that school is about them and see they have a place in their classroom as learners and contributors.



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Equity-centered project-based learning

The purpose of pre-K-12 schools is to prepare the nation's youth for successful futures, including work and civic life. By many measures, however, the current system fails to achieve these goals for some students, particularly those from nondominant or marginalized communities. Persistent achievement gaps between students of color and their peers are one form of evidence that the U.S. education system does not serve all students equitably.

It's been well-documented that schools that serve minority and economically disadvantaged students receive inequitable allocations of financial resources. This disparity impacts learning opportunities, including access to high-quality instruction and curricular materials. It is also linked to gaps in academic achievement, a lack of feelings of belonging in the school community, and a lack of access to future pathways.

Thus, the very system designed to achieve the nation's stated education goals of preparing U.S. students for work and citizenship disproportionately limit minority and economically disadvantaged students' engagement and learning opportunities (Noguera, 2003). To disrupt this cycle of failed promise for students of color and other nondominant communities—including students from low-income families, recent immigrants, and emerging bilingual students—equitable opportunities to experience high-quality instruction must become the North Star goal of policy and practice.

So what does equitable, high-quality instruction look like for each and every student? In recent years, definitions of high-quality instruction have broadened to include attention to 21st-century skills (collaboration, communication, creativity and critical thinking), in addition to aspects of social and emotional learning. The term “deeper learning” has emerged as shorthand for higher-order thinking, reasoning, and problem solving to better educate students and prepare them for college and careers (National Resource Council, 2012). Simultaneously, studies of both instruction and the ways students learn point to the importance of educational approaches that draw on and value students'

prior knowledge and experiences and their cultural backgrounds (Christianakis, 2011; Gutstein, 2003; Nasir et al., 2020; Rodriguez et al., 2004; Tate, 1995). These studies show that when schools explicitly value the differences in how students develop knowledge and interact with the world around them and then allow those differences to inform educational practices in the classroom, student engagement and learning improve and deepen.

Instructional designers, teachers, and school and district leaders use many strategies to support deeper learning, including connected learning (Ito et al., 2020), personalized learning, and project-based learning (Baines et al., 2021), the focus of this paper. Done well, these approaches provide an opportunity to structure classroom activities and foster relationships that support deeper learning and embody commitments to educational equity.

Integral to project-based learning is the explicit valuing of students' expertise and agency as resources for learning, a tenet at the heart of equity-centered instruction.

In this paper, we begin with background on recent research on learning and instruction, focusing on two mechanisms essential to deeper learning: (1) inclusion of authentic learning contexts and (2) valuing student voice as part of instruction. In the second section, we point to ways that culturally responsive and related pedagogies leverage these same two mechanisms to expand learning opportunities for historically underserved students. In this section we describe this set of pedagogies and refer to them collectively as equity-centered instruction. These two sections make the case for the primary claim of this paper, that instructional practices that integrate these two mechanisms



hold the key to unlocking what has been a significant challenge in education: how to provide equitable access to deeper-learning opportunities for each and every student.

We then turn to the potential of PBL and describe the ways that PBL and equity centered instruction can be mutually enhancing and provide transformative learning environments supportive of student learning and educational change. We demonstrate this by pointing to examples of PBL that embody the two mechanisms of deeper learning and equity-centered instruction: authentic learning contexts and student voice. We conclude with considerations for the kinds of local and systemic shifts that are needed to support educators, school leaders, and district leaders as they strive to foster the vision of equity-centered PBL.

How people learn

Recent policy shifts and standards frameworks call for deeper learning and knowledge-in-action approaches. The term deeper learning has become shorthand for higher-order thinking, reasoning, and problem solving to more effectively educate students and prepare them for future success in college and careers (National Research Council, 2012). While the work landscape is continually changing and some future careers are still unknown (Institute for the Future & Dell Technologies, 2017), there is growing consensus about the skills and

practices youth need to participate in and contribute meaningfully to this future landscape.

Across disciplines, more-recent standards frameworks—such as the Common Core State Standards (National Governors Association, 2010)—now emphasize a knowledge-in-action approach, in which the practices (or doing) of a discipline are as important as the ideas or content knowledge that were the focus of prior frameworks. For example, in the Next Generation Science Standards (Next Generation Science Standards Lead States and Partners, 2013), argumentation and forms of modeling of phenomena are “practices” that are interwoven with core content as part of student performance expectations, which mirrors the ways scientists develop insights as part of professional practice.

The shifts in instructional standards emerged in response to research on how students learn (Bransford et al., 2000), including mounting evidence of the efficacy of instructional approaches, like PBL, that are based on a knowledge-in-action and/or deeper-learning approach (Condliffe et al., 2017; Finkelstein et al., 2010; Furtak et al., 2012; Harris et al., 2015). Much is known about the critical role of feedback, student reflection, formative assessment, collaboration, and so on (Hattie, 2012). From this research, two foundational mechanisms of learning that underlie the recent shift in instructional priorities are the focus of this paper: (1) inclusion of authentic learning contexts and (2) valuing student voice as part of instruction.



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The power of authentic learning and student voice

Authentic learning contexts and valuing student voice are the key drivers of learning environments in which the interests, perspectives, and everyday lives of every student are an integral part of learning activities. Rooted in constructivist frameworks of teaching and learning, this approach is based on the premise that students need to make sense of new information in relation to their prior experiences and current understandings to integrate and consolidate novel ideas or perspectives. Without this sense-making, new information remains “inert,” and students lack the opportunity to see how the new information adds to other ideas or how a new idea is useful in explaining phenomena or addressing a problem (i.e., a lack of transfer) (Cognition and Technology Group at Vanderbilt, 1993; Kurtz & Honke, 2020).

Students need learning opportunities that allow them to make explicit connections to their own interests and experiences, thus providing authentic learning contexts. These connections provide a rich set of conceptual and motivational hooks that can engage learners and create connections among current and new ideas. Similarly, making these connections explicit can position students’ ideas and perspectives as integral to the learning process—as integral as the curricula and lesson materials themselves thereby valuing and responding to student voice. Students’ voice and experiential knowledge become necessary materials for the classroom learning environment.

Further, when students’ cultural perspectives are included as a key resource for learning, it deepens and extends students’ (and the class community’s) connections beyond the immediate learning environment. Focusing on the social and cultural aspects of students’ prior and current experiences, as well as their own views of who they are, broadens and strengthens the ways students connect to new ideas presented in the classroom and beyond. We will return to this broader social and cultural lens in the next section. But first, we address each of the two mechanisms essential to deeper learning.

Throughout this paper, we use the phrase “each and every student,” as opposed to “all students.” This is intended to invoke the complexity of ways each student shows up to and experiences schooling, especially as related to continuing systemic inequities, biases, and devaluing of minoritized students’ experiences.

Authentic learning contexts: Making class content relevant and meaningful

When learning environments and contexts connect to students’ everyday lives, including their interests and topics that are meaningful to their communities, student engagement increases along with a meaningful connection to instructional content (Aikenhead, 2006). Relating classroom work to a topic students care about increases the knowledge and practices that students can draw on (Bricker & Bell, 2014; Upadhyay, 2006), which helps students integrate new information into existing schema and creates opportunities for learning (Linn et al., 2006). Moreover, situating instruction in a context that relates to students’ lives and communities creates room for students to contribute ideas, language, and perspectives from outside the classroom. It’s a way to explicitly value students’ cultural histories and practices.

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Valuing and responding to student voice: Centering and empowering students

When students’ perspectives are valued and recognized as important contributions to classwork, students come to understand that school is about them and see they have a place in their classroom as learners and contributors (Calabrese Barton & Tan, 2010; Ladson-Billings, 1995). This also supports interest-



driven learning across school and everyday contexts, enabling students to pursue and make connections between settings and activities that increase knowledge building (Barron, 2006). When school is explicitly not reflective of who students are, they are less likely to see the value of classroom instruction and the connections to their lives. There is a higher likelihood that they will disengage from schoolwork, and school becomes a task that needs to be completed to avoid negative consequences (Esmonde, 2009).

Leveraging deeper-learning mechanisms in instruction

Several instructional approaches support educators in implementing these two foundational learning mechanisms, including connected learning (Ito et al., 2020) and personalized learning. One approach that is particularly well aligned to these mechanisms is high-quality or rigorous PBL, which engages students in sustained, collaborative project work anchored around a topic or driving question relevant to students' lives and interests. Relevance of the project to students' lives leverages the principle that instruction should connect to authentic learning contexts, including relevant topics and scenarios. As part of PBL, students' work products are celebrated in a public context. This often involves inviting community members to review students' work and, when appropriate, consider the implication of student projects, such as a proposal for a playground redesign to increase safety. This explicit valuing of student voice is an intentional principle of high-quality PBL that allows students to act as agents of change in their communities.

Leveraging these two mechanisms along with other effective instructional principles, high-quality PBL has been effective in supporting deeper learning, which is associated with success after school. In addition, PBL can support social and emotional outcomes related to learning (Krajcik et al., 2021), including preparing students to be agents of change in their communities, with a lens toward participation in our democracy.

Creating equitable opportunities for learning

While researchers studying how people learn have produced evidence about the benefits of using authentic learning contexts and valuing student voice, scholars focused on equitable opportunities for learning elevated these two mechanisms. This body of research focused on students' multiple and intersecting identities and ways to foster students' sense of belonging and membership in classrooms and schools. In this section, we revisit these two mechanisms as explored by scholars focused on cultural dimensions of learning and instruction as critical to educational equity.

Defining educational equity

Engagement and learning rely on instruction that is responsive to students' whole selves. Instruction that does not attend to these alignments for each and every student is inherently inequitable (hooks, 1994; Gutiérrez & Rogoff, 2003). Policies and initiatives that standardize learning experiences have come in the name of efficiency and productivity, beginning as far back as the origination of tax-funded public schooling and continuing through recent emphasis on high-stakes testing (Cuban, 2012). The dominant culture in the United States has been the primary influence on the content of and processes guiding standardized learning and measurement design (Noguera, 2003). An adverse impact of this has been differential opportunities for learning and subsequent disparate learning outcomes for students of color and students from low-income households. This has led to deficit-based narratives about those students (Dumas, 2016), exacerbated by recursive wealth and education-funding relationships (Darling-Hammond, 2000).

To redress the standardizing instruction, and its limitations to support each and every student, requires attention to the plurality of the individuals involved in the learning process and an explicit attempt to organize learning around activities that are of value to students, families, teachers, educational leaders, and the broader communities to which these stakeholders belong. Paris and Alim (2014) argue for this vision to be linked to broader goals of education when they call for pedagogies that, "perpetuate and foster linguistic, literate, and cultural pluralism as part of the democratic project of



schooling and as a needed response to demographic and social change.” We refer to these collective perspectives as *equity centered* for the remainder of the paper.

Ideological roots of equity-centered instruction

Educational scholars have problematized current practices of U.S. schooling, pointing to their origins in social and cultural contexts in the 1900s that did not consider the needs and well-being of all citizens equally, and thus did not consider the needs and well-being of each and every student equally. We note that the focus of this paper, the potential of equity-centered instruction fostered by high-quality PBL, does not include a comprehensive discussion of the broader set of practices such as teacher preparation and educational leadership. We limit our discussion to equity-centered instruction in this paper, recognizing that there are interdependencies between instruction and other aspects of schooling within educational systems.

Cultural dimensions of learning

A well-documented criticism of recent instructional approaches is a lack of attention to the cultural aspects of teaching and learning. This argument attends to the idea of bias, in which the language used in instructional materials or the prior experiences students were assumed to have come from the dominant culture. But this challenge goes further, pointing to the idea that learning environments and activities should reflect the lives of each and every student to ensure instruction is relevant and impactful for all. This tenet of equity-centered instruction aligns with the learning mechanisms described in the prior section, which support deeper engagement by cultivating learning environments that are authentic and relevant to students’ experiences and by valuing student voice.

The terms culturally relevant pedagogy (Ladson-Billings, 1995) and culturally sustaining pedagogy (Paris & Alim, 2014) describe broader pedagogical framings in which equity-centered instruction considers expertise students bring to the classroom to be important resources for learning. These resources include pathways of developing knowledge, communication, collaboration, and problem-solving skills (Herrenkohl & Mertl, 2010). These framings explicitly name inequities related to the exclusion of representations of nondominant cultures, languages, histories, and communities in most classroom learning and assessment activities. In partic-

ular, they recast deficit-based narratives of achievement gaps as deriving from inequitable instructional practices (Nasir et al., 2006). The lack of teachers from nondominant communities is another signal to students of whose perspectives are valued (or serve in the role of authority) (King, 2017).

Scholars also point to the history of schooling, teacher preparation, and leadership practices, etc., and the ways cultural dominance and exclusion (e.g., not integrating with local histories) has been perpetuated, calling into question the broader aims of education writ large (hooks, 1994; Noguera, 2003). The U.S. education system interacts with communities via local school sites and their histories (Alim et al., 2020), and schools and classrooms play a critical role in reproducing or transferring the implicit cultural dimensions of schooling.

Identity, engagement, and learning

Adding to this argument that learning environments and activities should reflect the lives of each and every student is scholarship that examines the role of students’ developing identities on their engagement and learning. These bodies of work expand definitions of student engagement by asking what is engaging for which students and why it is important to consider student engagement in this way.

The question “What is engaging for whom?” mirrors the argument that students should recognize that their linguistic, historical, and cultural backgrounds are valued in classroom activities. It also connects to how students develop school-related identities and envision their future selves. For example, students may or may not see themselves as “math people” or as “people who are good with technology.” Because moment-to-moment discourse and activity in classrooms signal who and what is valued in a particular class or context, in school—or in our larger society—classroom interactions influence how students perceive whether they are valued, how they see their own worth, and whom they wish to become. The ways these interactions support or limit the choices students see as viable or valuable have been identified as another possible source of cultural inequity, as related to dimensions of students’ identities, such as race (Nasir, 2011), gender (McCreedy & Dierking, 2013), and cultural background (Bang et al., 2012).



Equity-centered PBL principles

The key principles of PBL outlined by Baines et al. (2021) describe learning environments and experiences that support deeper learning for students across income levels, ethnicity, reading ability, and English language ability. These studies show the positive impact of project-based learning across content areas, grade levels, and for students from all types of backgrounds. The researchers found PBL improved student achievement in targeted content areas as well as in other subject areas and aspects of social and emotional learning. (Deutscher et al., 2021 [↗](#); Duke et al., 2021 [↗](#); Krajcik et al., 2021 [↗](#); Saavedra et al., 2021 [↗](#)).

Having described the origins of two foundational learner- and equity-centered instruction mechanisms—authentic learning contexts and valuing student voice—we now examine their alignment to four key PBL principles to illustrate how practices of rigorous, high-quality PBL support equitable, deeper learning. Additionally, we explore how designing PBL with explicit attention to these dimensions can further the potential of PBL to provide opportunities to engage learners from all backgrounds, specifically learners from nondominant communities that have been historically underrepresented and under-resourced in educational design and policy.

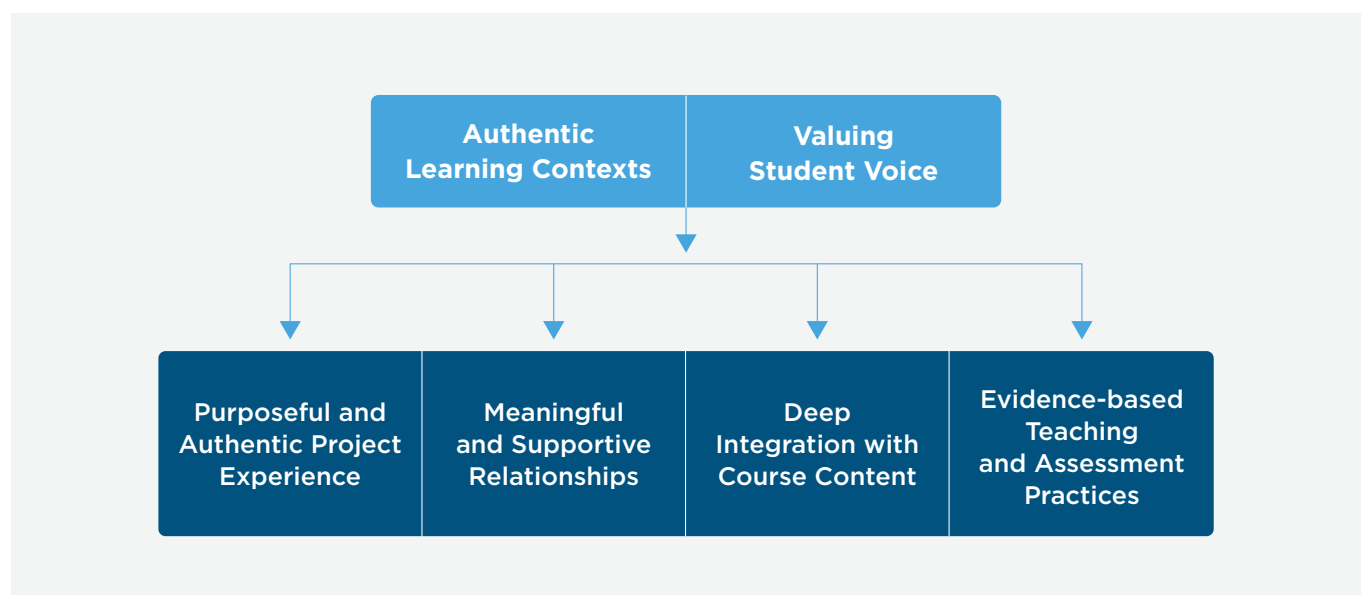
1. Purposeful and authentic project experience

Effective PBL requires purposeful and authentic experiences generated by students engaging in relevant questions. A main question should drive a unit of study, and that question should be feasible to consider, worthwhile, contextualized, meaningful, and ethical (Krajcik & Shin, 2014).

These questions should be related to students' lives, the communities in which young people reside, and real-world issues happening outside the classroom. For example, projects might address questions such as how to design a new park that supports local plant life, build affordable housing, or solve a public-health problem. Projects should be coherently sequenced and use tools, practices, and standards relied upon in real-world settings.

This key principle encompasses both learning mechanisms. In considering the purpose and authenticity of instruction, educators ensure that instruction reflects the interests and everyday lives of the varied learners involved (i.e., authentic learning contexts), including their perspectives and histories (i.e., valuing student voice). As a way to intentionally value the cultural and historical characteristics of the community in which students are learning, educators might evaluate instruc-

Key Principles of PBL





tion by asking the following: What student funds of knowledge (González et al., 2005) or community cultural wealth (Yosso, 2017) is cultivated as part of the authentic learning experience? When integrating the perspectives and voices of students and stakeholders they may be working alongside, such purposeful work promotes a sense of civic purpose and moves students toward models of civic innovation (Mirra & Garcia, 2017).

In this way, projects could focus on student-identified concerns so that classroom work is in service to one's community and aligns with the values, perspectives, and traditions that make up that community. This approach aligns with Youth-Led Participatory Action Research (YPAR), which describes a "cyclical process of learning and action" through which "young people are trained to conduct systematic research to improve their lives, their communities, and the

institutions intended to serve them" (*Why YPAR?*, 2022). Caraballo (2013) calls out YPAR origins in specific work to structure projects as "collective investigations that rely on indigenous knowledge, combined with the desire to take individual and/or collective action" in contrast to giving value to learning objectives generated by "academic and professional research-based institutions".

An example of this PBL principle in middle school civics is the vision of the [Democratic Knowledge Project](#) (DKP), housed at the Edmond J. Safra Center for Ethics at Harvard University. Within the context of supporting students to advocate for changes in their communities, the DKP curriculum engages students in thinking about their civic identities and skills as citizens through local projects that they identify, structure, and conduct.

Be A Changemaker

10 Questions to ask yourself for equitable, effective, and self-protective civic agency:

1. What matters to me and why?
2. How much should I share?
3. How do I make it about more than myself?
4. Where do we start?
5. How can we make it easy and engaging to join in?
6. How do we get wisdom from crowds?
7. How do we handle the downside of crowds?
8. Are we pursuing voice or influence or both?
9. How do we get from voice to change?
10. How can we find allies?

CIVIC ENGAGEMENT IN OUR DEMOCRACY

dkp

How do I become an authentic, informed, and skilled changemaker, and why does it matter?

Preamble Week

I will build community with my classmates and explore civics, democracy, change-making, and three civic dispositions.

Unit 1

I will take on the role of community member to create a story of self that explores my values and identity.

Unit 2

I will take on the role of educator to teach others about rights.

Elections Module

I will explore topics like political parties, the electoral college, the history of voting rights, and alternative voting systems.

Unit 3

I will take on the role of lawyer to write a legal brief about whether the American presidency has too much power.

Unit 4

I will take on the role of petitioner to create a petition about an issue that matters to me.

Unit 5

I will take on the role of political scientist to write an opinion piece about a lever of change and why it matters.

Media Literacy Module

I will explore topics like digital citizenship, bias in media, and misinformation.

Unit 6

I will practice being a changemaker and plan and complete a civics project in my community.

Story of Civic Self

I will create a personal narrative that explains how my sense of civic self has grown over the course of the year.

The Democratic Knowledge Project's 10 Essential Questions inform the structure of the 8th grade civics curriculum, *Civic Engagement in Our Democracy*.



2. Meaningful and supportive relationships

Meaningful and supportive relationships matter in education generally and definitely with project-based learning. Schools with a strong culture of collaboration and that reward risk taking, view mistakes as learning opportunities, and emphasize students' social and emotional learning skills foster rich PBL environments. Quality PBL benefits from collaborative peer-to-peer interactions and trusting student-teacher relationships.

The social foundations of classrooms and schools can magnify the benefits of authentic learning environments. Equity-centered instruction, like PBL, hinges on relationships that foster self-efficacy, allowing students to feel safe to contribute, collaborate, hear feedback and identify ways to improve, and take chances. These relationships are built by developing trust and respect with and among students and communities (Moses, 2009). This principle is at the heart of educational processes that value and are responsive to students' voices, like equity-centered PBL.

vulnerability and for the development of ongoing, shared commitments to addressing students' needs and concerns, including those created by traditional schooling practices. This focus laid the foundation for engaging in activities that students cared about and explicitly signaled to students that they were valued members of their learning community.

As a guiding principle for equity-centered PBL, meaningful and supportive interactions require reconsidering and reshaping relationships and the historic positioning of individuals in classrooms. With a supportive learning environment in place, students can feel safe taking intellectual risk, productively struggling, expressing their own ideas, and making decisions about their learning. As part of equity-centered instruction, student agency not only is linked to students' increased engagement and deeper learning but can be an intentional, explicit signal to students of their competence and value.

3. Deep integration with course content

Projects should feature deep integration with course content and be rooted in core subject areas, helping to deepen and build student knowledge of important topics. The multidimensional nature of PBL makes it a strong approach for interdisciplinary learning, so projects can simultaneously build student understanding of math concepts and scientific phenomenon and improve literacy skills, for example.

As noted, new instructional standards focus on a knowledge-in-action approach to instruction in which students apply knowledge in contexts that provide opportunities to engage in relevant knowledge-building practices (modeling, data collection and analysis, argumentation, etc.). This promotes equitable educational outcomes by calling for opportunities, for each and every student, for deeper learning and development of skills that will be crucial in college and career pathways. This approach also challenges deficit-based notions that struggling students need to master basics before engaging with inquiry- or student-centered learning approaches.

Equity-centered PBL also calls for authentic learning contexts in which students can use or apply skills and disciplinary practices (design, experimentation, etc.) to build their understanding of ideas in science, math, history, etc. An authentic learning context or problem can involve the application of concepts or skills from



Recognizing a need to engage students in deep learning, reflection, empathy, and fun, this project aimed to design and study a Project-based learning ecosystem to support ninth grade English language arts (ELA). Researchers tested the prototype projects that were developed through a design-based research process from 2015 to 2019. The study was led by Drs. Joseph Polman, Alison Boardman, and Bridget Dalton at the University of Colorado at Boulder and Antero Garcia at Stanford University.

For example, in [Compose Our World](#) —a ninth-grade English language arts curriculum—classrooms centered relationships that paired caring and advocacy (Boardman et al., 2021). This model, referred to as CAPE (Caring, Advocacy, Perspective Taking, and Empathy), sought to create classrooms as spaces for



across disciplines. Developing a proposal for a new playground design requires design (math and science) as well as communication (English language arts) and skills that support learners across topics (planning, collaboration, etc.). In a [recent study](#) of [Learning Through Performance](#), a PBL middle school science curriculum, PBL students outperformed their peers on statewide math, English language arts, and language proficiency assessments (Deutscher et al., 2021).

Organizing learning around projects that give students voice, as part of their growing understanding of rigorous content, is an essential component of supporting students' developing identities, as connected to schooling and to the disciplines they are exploring. Consider the difference between a science unit in which students learn about how playgrounds are designed and manufactured versus a unit in which students design a new playground and present their work to a local committee. In the former case, students are introduced to engineering as having relevance, as a way to solve problems, and even as a potential career. In the latter case, students are engineers. The value of seeing oneself as participating in a community cannot be underestimated, especially for students who have not benefited from narratives that place them in roles of competence and influence (Pinkard et al., 2017; Van Horne & Bell, 2017).

In considering how to integrate rigorous, standards-aligned course content into equity-centered PBL, we must also consider what principles are brought in, which histories of the discipline are foregrounded, and what kinds of knowledge may be excluded implicitly or explicitly. If a goal of equity-centered PBL is to allow students to see themselves in the work and to develop their own perspectives about a discipline (Shulman, 1986), it must be done with a critical examination of how content was identified and prioritized as part of the educational standards, in addition to recognizing perspectives that have not been included (Bang et al., 2012; Luke, 2004). The history of science, for example, is fraught with examples of exclusionary practices that have kept people of color and women from participating in developing theories and ideas, forming communicative practices in science, and applying science as a tool of public policy. These systematic exclusions must be examined to understand their role in education, especially as they reinforce cultural dominance.

To be clear, this examination of a discipline is a powerful opportunity to circle back to an authentic, purposeful engagement as part of equity-centered PBL learning. Making direct efforts to address student

contributions in class and to connect classroom-based disciplinary learning to students' expertise developed outside the classroom specifically positions students as having knowledge that is valuable in their classroom. This approach can benefit from knowing what problems are pressing in the community, acknowledging students' expertise in bringing ideas from outside school to inform classroom content to develop solutions, and recognizing students' ability to evaluate solutions posed to their community.

4. Evidence-based teaching and assessment practices

Learning from research and relying on evidence about what works is essential. There is still much to learn, but research has led to a lot of information about the practices that benefit PBL instruction. When educators are supported in using these approaches—through professional-learning opportunities, collaborative teaching environments, and quality resources—they can feel confident in their ability to bring rigorous PBL into their classrooms.

The direct connection to authentic learning contexts and student voice in the rigorous PBL principles above most closely bind PBL to deep commitments of equity. Next, we consider the evidence base for teaching and assessment practices, pointing to approaches that support equitable opportunities for learning, while also remaining mindful that even evidence-based practices require consideration of how they may reinforce historical inequities (Noguera, 2003). Evidence should reflect local concerns, be usable by local stakeholders, and reflect the quality of the learning opportunities available to students.

Evidence-based practices that support equitable opportunities for learning incorporate assessments that align to the principles of instruction, such as PBL, that value student voice and observe learning in authentic contexts. Performance- and portfolio-based approaches align to these principles and also draw on the community members or others implicated by students' work. In addition, evaluative programs that include continuous improvement methods and require codesign among researchers, designers, and practitioners serve to build capacity among teachers and administrators to align their efforts, including customizing instruction for their local context and needs. Similarly, evaluative measures of instruction and teaching



that emphasize the relevance of student work to broader communities reinforce teaching mindsets and practices that value student voice.

Shifts toward equity-centered PBL that incorporate evidence-based teaching and assessment practices will require professional learning for classroom teachers and school and district leaders. The [Project-Based Learning Penn GSE Certificate](#) program through the University of Pennsylvania’s Graduate School of Education is an excellent example of a professional-learning opportunity. Most successful PBL implementations have included ongoing support in the form of coaching or regular group sessions throughout the school year. Structured grade-level or [topic-focused professional-learning](#) communities are especially valuable.

Shifting to equity-centered PBL

To successfully implement equity-centered PBL, the principles of rigorous PBL must work in harmony with the mechanisms of deeper learning and equity-centered instruction. This requires a deep and ongoing examination of the roots of public schooling and the commitments that systems, educators, and students make. Maintaining a just, democratic educational system requires confronting and responding to colonial, racist, sexist, and other forms of discriminatory legacies embedded within schooling on an ongoing basis. The deep theoretical and moral underpinnings of equity-centered instruction reshape the ground in which



Photo: Brightworks

pedagogical practice is sown. The day-to-day enactment of equitable learning weaves together disciplinary and content knowledge with instructional design that is antiracist, liberatory, and dignity affirming.

To successfully implement equity-centered PBL, the principles of rigorous PBL must work in harmony with the mechanisms of deeper learning and equity-centered instruction.

The extent to which equity is achieved rests on the power of a system-wide approach that weaves together multiple principles. Developing teachers’ abilities to affirm students’ cultural identities and experiences, including various types of knowledge, values, and expertise (Nasir & Vakil, 2017), must occur in tandem with the on-the-ground pedagogical shifts happening in classrooms. Without explicit and ongoing examination of alignment of practice to these commitments, infrastructure and systemic dynamics can reify historically inequitable opportunities and outcomes. While equity is often the impetus for PBL, the meaningful nature of roles, projects, and collaboration in project-based learning does not exist within a vacuum isolated from the historical conditions of inequality that pervade our school systems.



SHIFTING TO PBL AT B.F. DARRELL HIGH SCHOOL

This summary illustrates how school culture and teacher mindsets go hand-in-hand with supportive structures to enable rigorous PBL.

New Tech High School at B. F. Darrell is a school of choice in the Dallas Independent School District, serving inner-city youth through a PBL approach to prepare students for a competitive global society. Originally a neighborhood high school that was consistently underperforming and struggling to meet state minimum requirements, the state decided to reconstitute the school. In 2011, it joined New Tech Network, a nationwide school network and improvement design partner dedicated to helping learners gain the knowledge and skills necessary for life, college, and the 21st-century workplace.

B. F. Darrell experienced great success in its first year but was unable to keep the momentum going because of a number of factors. When Jameile Choice started as principal at B. F. Darrell in 2015, he encountered pushback from many of the school's teachers about whether PBL was the right instructional model for their student population. Teachers worried that PBL would not be effective with urban students from low-income, minority families who were already struggling by traditional measures of performance. However, what appeared to be a

roadblock became an opportunity to help shift the mindsets of teachers and demonstrate the value of PBL for these students.

Starting with a small cohort, teachers began to dig into strengthening their PBL practice and give more agency to students to become leaders in their own learning. As this momentum spread throughout the school, more teachers began to see the successes of PBL, the strength and abilities of their students, and the opportunities PBL created for empowering students to drive their own learning. For students, interactions with professionals in the community made their classroom work more meaningful, and it helped students see the applicability of the skills they were learning in school, such as collaborating with peers and problem solving, as drivers for their success partnerships out of school. This provided teachers and school leaders with further validation of the value of PBL for their students.

B. F. Darrell remains accountable to state assessments. However, the school has also identified its own school-wide learning goals that better align with its instructional model. These include developing 21st-century skills, such as oral and written communication; collaboration with peers;

content literacy; critical thinking and problem solving; and global awareness. This approach demonstrated positive learning outcomes for students. More important, these skills are preparing B. F. Darrell students for more successful futures, whether that pathway leads them to college or directly into the workplace.



New Tech High School at B.F. Darrell in Dallas Independent School District



A shared vision for equity-centered PBL

Educators, school leaders, and district leaders adopting equity-centered PBL must be guided by a shared vision for teaching and learning, and this vision must be supported by aligned institutional practices. However, a shared vision for teaching and learning without an examination of current pedagogical practices may simply overlay new approaches onto existing infrastructures that ultimately undermine common goals. Therefore, schools or districts adopting equity-centered PBL must first take stock of their current practices, consider where their practices need to shift, and identify how they can leverage their local strengths and expertise. In addition, shifting to new practices always requires significant professional-learning opportunities.

Supportive culture and processes for implementing PBL

Making a shift to equity centered PBL as the primary approach to teaching and learning is more than a change in curriculum. As described, equity-centered PBL requires that teachers and school leaders are willing to promote authentic learning contexts and value student voice. While equity-centered PBL classrooms ideally provide safe and identity-affirming learning environments, the impacts of such environments can have a greater impact when embedded within school cultures that reflect the same commitments. This is ultimately driven by an organizational culture that values continual reflection and growth and in which there is a high degree of trust among staff and students. These shifts do not happen all at once. It takes time and sustained effort for these changes to permeate the overall culture at a school or across schools.

A school's culture is reflected in the daily activities and interactions of the staff, students, and leaders. In learning environments supportive of equity-centered PBL, the language of the school will take an asset-based view of students, positioning them positively and recognizing their strengths and expertise. School staff can set goals and shared visions for instruction that prioritize students' whole selves; structure time for teachers to collaborate to realize these goals and vision (Spillane et al., 2002); and create regular opportuni-



ties for eliciting student voice and feedback to inform school decisions and policies.

Equity-centered PBL learning environments must be supported by wider systems including structures for assessment, evaluation, and professional learning that embody shared commitments to equity and deeper learning (Penuel, 2019; Penuel et al., 2020). For example, the focus on what principals look for when they evaluate teachers and how students are assessed may need to change. Teachers will also need support in understanding how to assess student learning within an equity-centered PBL project. How can they ensure that standards are being met or that there is deep integration with disciplinary content? Having access to supportive curricula and models for grade-level and content-specific equity-centered PBL is especially important for teachers beginning this work.

While many of these considerations for supportive infrastructure reflect existing understandings of best practices for schools, anchoring these experiences, materials, and collaborations in equity-centered approaches to teaching and learning are the lynchpin of this work. If schools lack clarity regarding the role, purpose, and utility of equity-centered PBL, these infrastructural efforts may lead only to surface-level changes and a lack of buy-in from teachers, students, and other stakeholders.



SHIFTING TO PBL AT VISITACION VALLEY MIDDLE SCHOOL

This summary demonstrates how both structural changes in schooling practices and a substantive professional-learning community are enabling conditions of equity-centered PBL.

Visitacion Valley Middle School (VVMS) is an ethnically and culturally diverse middle school in the San Francisco Unified School District (SFUSD). VVMS serves many recently arrived immigrants who are English learners, and more than two-thirds of families are socioeconomically disadvantaged. When principal Joseph Truss joined VVMS in 2015, he saw an opportunity to build on existing teaching approaches (e.g., deeper learning, Universal Design for Learning, and PBL) to create a cohesive instructional vision through a more rigorous, equity-centered enactment of PBL.

At the district level, a middle school redesign initiative was underway to create deeper, more personalized learning. Early in the redesign initiative, middle schools in the district transitioned to a modified block schedule and trimester system to provide students with extended time for learning and allow participation in an expanded range of classes and programs. Teachers were provided weekly early

release time to support ongoing professional learning and collaboration. These structural changes helped create a supportive foundation for PBL to gain traction at VVMS and throughout other SFUSD middle schools.

At first, some teachers resisted the shift to PBL—a common challenge for any school taking on any new teaching strategy or initiative, especially one that is driven by school leadership. Recognizing the need to attend to teachers’ commitment to PBL and support their professional learning, SFUSD developed a PBL-focused strand of their Teacher Leader Fellowship program to engage teachers directly in this work. Two VVMS teachers participated in the first year of this voluntary fellowship program, enabling them to have more ownership of the work and explore their own inquiry questions about PBL. Since then, additional VVMS teachers have participated in the fellowship program, in addition to other professional-learning opportunities to strengthen their PBL practices.

In recent years, VVMS has seen increasing teacher support for and stronger implementation of PBL. The structural shifts at the district level (e.g., transition to a block schedule and teacher release time) and the engagement and support of teachers through the fellowship program have been noted as contributing factors to the successes to date. There is still work to be done to address other challenges, such as expectations for school performance and measures of student learning. Standardized testing is still the primary measure of achievement, but there has been movement toward portfolio-based assessments that better align with the outcomes of PBL.



Visitacion Valley Middle School in San Francisco Unified School District (Courtesy of Joe Truss)



Reflection on equity in schooling practices

To arrive at shared commitments to equity-oriented goals and shared understandings of how equity-centered PBL can support these goals, school communities must first reflect on their current practices. Given that views of teaching, learning, and the way schools function are historical and sometimes taken for granted, many school practices can be invisible. This is one reason why educators dedicated to equity-oriented goals can unknowingly reinforce inequalities (Nasir & Vakil, 2017). Therefore, schools or districts need to look critically at their histories, current school practices, and existing avenues (or roadblocks) for fostering equity-centered PBL.

It is also critical that there is a clear and shared understanding of “equity” as well as areas of inequity among staff as it pertains to their district, school, classroom, and students. In developing this shared

understanding of equity, staff can work toward identifying concrete examples of equity and inequity and clarifying their roles in contributing to and combating harmful practices within the district, school, and classroom.

Gathering student and family perspectives is critical to doing this work well. School leaders, for example, might survey students about their experiences as learners within the school. In the Critical Civic Inquiry YPAR project (Kirshner et al., 2015), eliciting student feedback in one middle school surfaced problematic school discussions around college attendance that left undocumented students feeling excluded and marginalized. School or district leaders might additionally hold focus groups to gather family perspectives of school practices and issues surrounding equity and access. Together with staff, school leaders can use these data to identify gaps between current and desired learning environments.

Conclusion

We have described the emergence of two foundational learning mechanisms, authentic learning contexts and valuing and responding to student voice, informed by research on how people learn and educational scholarship on equitable learning and schooling more broadly. We showed that these mechanisms align with core tenets of project-based learning, an evidence-based approach to instruction. And we discussed the mutually enhancing relationship between PBL principles and equity-centered instruction. We offered examples from practice and empirical findings pointing to the

impacts of PBL for students with various backgrounds and across school settings to illustrate the power of this approach and its promise.

Given this evidence and the clear alignment between PBL and tenets of equity-centered instruction, it is not surprising that during the pandemic, which has shined an even brighter light on pervasive inequities in U.S. schooling, PBL has been identified as a prime strategy for boosting engagement and learning.

While developing, implementing, and continuously improving equity-centered PBL is complex and requires resources and attention from many leaders and stakeholders, the futures of students, and our society, demand we take on this challenge.



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The impacts of equity-centered PBL classrooms, which can provide safe and identity-affirming learning environments, are amplified when embedded within school cultures that reflect the same commitments.



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