CADRE

The Colorado Performance-based Assessment Pilot: Background and Context

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Introduction

This paper serves as the first of three papers addressing the topic of using performance-based assessments in Colorado to meet graduation requirements or to demonstrate postsecondary and workforce readiness (PWR). This first paper provides background context and information about the Colorado Department of Education's (CDE) *Collaboratively Developed, Standards-based Performance Assessment* pilot and the theory of change envisioned for schools that decide to take up this work of using performance-based assessments (PBAs). This paper concludes by introducing the multi-site case study work conducted by researchers at the Center for Assessment, Design, Research and Evaluation (CADRE) at the University of Colorado's School of Education. This case study focused on the experiences of two schools using PBAs for PWR purposes. The objective of this multi-site case study work was to learn from schools that have been engaged in using PBAs for several years to establish relevant learning experiences for students that align with the Colorado Academic Standards and foster essential or 21st century skills. Following the background information provided in the first paper, the second paper in this series describes the case study context and sites in more detail, and focuses on the environment supporting the implementation of this work at each school. The third and final paper of this series moves into the classroom experiences taking place for four teachers (two at each school) implementing this PBA work. The information and results in this series of papers will be of interest to schools and districts in Colorado seeking to move in this direction of using PBAs for assessing PWR and graduation readiness. Since the case study work is connected to CDE's pilot, we first present brief background information about CDE's pilot work before explaining the theory of change driving the vision for using PBAs for PWR evaluations.

Background: The Colorado Performance-based Assessment Pilot

In the 2018-19 school year, the Colorado Department of Education (CDE), with partners from five schools across four districts, embarked on a two-year pilot to experiment with the use of performance-based assessments (PBAs) to help determine a student's readiness for graduation. As indicated by Colorado's Graduation Guidelines Menu of Options, PBAs are featured as a possibility for schools and districts to use in their evaluations of whether students are meeting graduation competencies as defined by the state and Colorado Academic Standards (CAS). This pilot project was undertaken by CDE to: 1) define the specific array of essential skills (i.e. "21st century skills") that would be fostered through the learning and assessment experiences provided by these PBAs; 2) develop a community of practice across educators to support learning around the development and uses of high-quality PBAs; and, 3) promote an equity-centered focus on teaching and learning by designing tasks and activities that connect with the diverse backgrounds and interests of all students while maintaining the rigorous expectations of the CAS.

An important outcome from the two-year pilot was to establish common understandings and definitions for key essential skills that would support the CAS and be assessed using the PBAs. Several tools including a common rubric were developed by pilot participants to evaluate the integration of essential skills with tasks. This rubric serves as a resource for helping teachers design tasks that embed the subset of prioritized skills selected by teachers. Additionally, another key preliminary outcome reported by all pilot schools is that using these PBAs yielded benefits for both teachers and students. According to CDE staff, schools reported

that the PBA work activated student interest and engagement by providing them with authentic (i.e., real-world and applied) opportunities to demonstrate their mastery of both content and skills. However, these outcomes are based on anecdotal evidence shared by the initial pilot schools.

Two years later, in the 2020-21 school year, the work of the pilot shifted. During that year, CDE sponsored virtual professional learning communities to expand the knowledge base on using PBAs to help establish PWR determinations for graduation. CDE staff recruited teachers throughout the state to focus on building their capacity to understand the features of high-quality PBA tasks and to practice norming their expectations on evaluating student work with other teachers. These collaborative spaces were facilitated by an external organization, 2Revolutions, and a desired outcome of this work was to learn whether participating teachers could take up the learnings and begin the process of designing and using PBAs in their classrooms. More information about the CDE Performance-based Assessment Pilot can be obtained by visiting the CDE's Collaboratively-developed, Standards-based Performance Assessment website.

Why the Focus on Performance-Based Assessments?

For over three decades, many educational researchers have pushed for a shift towards using PBAs as a powerful curriculum-embedded assessment for improving learning outcomes, and for identifying what students know and can do on complex tasks (Heritage, 2018; Linn et al.,1991; Stiggins, 2006). Educational researchers point to the promise of these assessments to cultivate important "21st century skills" including reasoning, problem-solving, metacognitive, and self-regulation skills, while immersing them deeply in content through authentic learning tasks (Darling-Hammond, 2017; Shepard, 2019). When designed well to support a socio-cultural learning model, PBAs can foster more equitable learning environments for students, as students draw on their identities, experiences, and interests to own and help guide the direction of their learning and their expressions of what they know and can do, while contributing to the learning of others (Shepard et al., 2017).

The long-term vision for this work in Colorado is that eventually, school districts will pivot away from relying mainly on results from large-scale standardized tests to determine graduation readiness, and use a variety of rich data points such as PBAs to inform a more holistic PWR evaluation for students. This does not mean that standardized approaches will no longer be used to evaluate PWR. For example, educators from districts across the state can build and use common PBA tasks and employ standardized procedures and expectations for scoring these tasks. However, the distinction between these tasks and the large-scale standardized tests is that these tasks can be designed to promote student agency by connecting to student identity, expression and interests. In contrast, the large-scale tests tend to be limited in format (i.e., multiple-choice) and are administered under highly constrained testing conditions.

Additionally, the use of PBAs to inform judgments about PWR constitutes an important component of the state's equity-centered work for teaching and learning. That is, if designed and implemented well, PBAs facilitate deeper levels of student engagement by resonating with the diverse identities and backgrounds of students. Furthermore, they promote agency by allowing students to participate in scenarios and tasks that encourage them to engineer solutions, solve problems and collaborate with others (Pinkard et al., 2017; Van Horne & Bell, 2017).

Theory of Change for PBA Work

Within the context of this PBA initiative sponsored by CDE, a focal area of interest is to learn whether the integration of PBAs into classroom activities yields evidence of deeper learning experiences for students, as well as evidence of teachers applying formative assessment practices to strengthen and motivate student-centered learning at schools. To theorize how the supports and conditions at schools using PBAs would lead to desired outcomes, we used a conjecture map (Sandoval, 2014) to help describe the theory of change behind this initiative. Sandoval (2014) conceptualized conjecture maps as "a means of specifying theoretically salient features of a learning environment design and mapping how they are predicted to work together to produce desired outcomes" (p. 3). At the most general level, the conjecture map begins with a clear articulation of the long-term vision or objective for the project or what Sandoval calls the "high level conjecture about how to support learning in some context." The high-level conjecture or vision is supported by two areas that Sandoval calls "Embodiment" and "Mediating Processes." Embodiment encompasses the key features of the implemented program or the learning environment. Mediating processes consist of the observable interactions and the artifacts that surface from the work. The hypothesized linkages between the features captured under embodiment and mediating processes consist of the design conjectures specific to the design of the learning environment. The theoretical conjectures reflect the linkages between the mediating processes and the envisioned outcomes of interest. For our conjecture maps, we use the terms "supports and structures" to replace the term "embodiment," and we use the terms "observable practices and products" to replace the term "mediating practices."

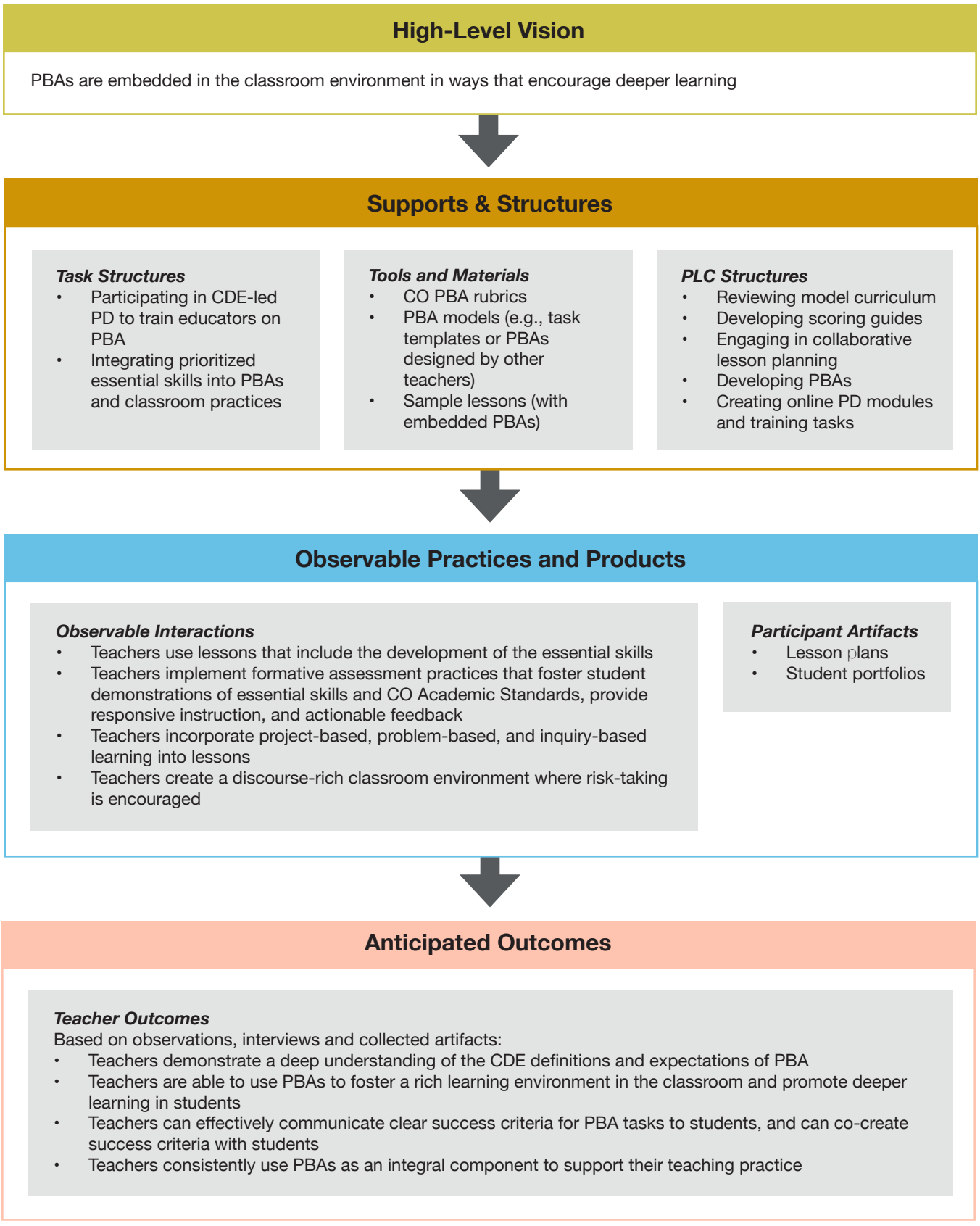
The connections or relationships on the map represent testable hypotheses that can be revised and adapted as stakeholder inputs and project learnings further inform the work over time. Separate conjecture maps for teachers and for students were developed since each group will requires different supports, and that the observable behaviors resulting from those supports will differ across groups. In each map we walk through the connections that illustrate the overarching vision for teachers and for students, examples of tools and supportive conditions provided, and examples of what we hope to observe from both groups to meet the aspirational outcomes for using PBAs as part of PWR evaluations.

Teacher Conjecture Map

In this section, we walk through the conjecture map to articulate the underlying connections between the boxes depicted in Figure 1. These connections reflect the conjectures based on what we (the authors) believe will occur due to implementing supports for enacting this PBA work at schools and based on the existing literature on PBAs. As illustrated in Figure 1, the overarching "High Level Vision" ("PBAs are embedded in the classroom environment in ways that encourage deeper learning") sets the stage for the rest of the conjecture map. The assumption is made here that PBAs will serve as an essential part of classroom assessment practices taken up by teachers to help fulfill the vision of providing deeper learning opportunities for students (Guha et al., 2018; Kingston, 2018; Tung, 2010).

Following the larger vision, we move to the next box down from the vision ("Supports and Structures") that specifies examples of the policies, resources and activities provided by schools, the district and/or the state to support the PBA work taking place at each site. As indicated in this box, we expect teachers to

Figure 1. Teacher conjecture map



participate in professional learning communities to develop high-quality PBAs. Based on their participation in these professional learning communities, we anticipate that teachers will learn how to integrate prioritized essential skills into the design of PBAs so that these skills become activated as part of the disciplinary activities addressed in the lessons and tasks. To do this, we anticipate that teachers will refer to sample or model lesson plans, units, and tasks to help inform the design of their own curricular materials. We also anticipate that in the training received either locally or through the state, teachers will collaborate to strengthen both instructional and assessment skills to inform their teaching and to evaluate learning in the classrooms.

Moving to the next box down, "Observable Practices and Products"; if we hypothesize that policies, supports, and activities are being implemented as envisioned for this project, we anticipate that these supports will result in observable classroom practices and artifacts that are essential to achieving the anticipated or desired outcomes (e.g., see the last box in the conjecture map). Based on this assumption, classroom activities designed and implemented by teachers would help students to develop essential skills, such as collaboration and time management, while also supporting students to develop mastery of disciplinary content. We would also observe teachers engaging in a wide range of strong formative assessment strategies as the primary device for building students' essential skills and disciplinary understandings. As a result of instituting these practices in the service of co-creating a strong learning community with students, we would then expect to observe learning environments where discussions are student-centered, and risk-taking in learning is welcomed.

In the final box, "Anticipated Outcomes", we posit that after receiving the supports and structures described above, (see Evans, 2019; Guha et al., 2018), teachers' sustained use of this approach will lead to a number of outcomes including: pedagogical behaviors that promote deeper learning; ongoing interest in incorporating PBAs in their classrooms; and the ability to clearly articulate success criteria for students as it relates to the key learning objectives captured by the PBAs.

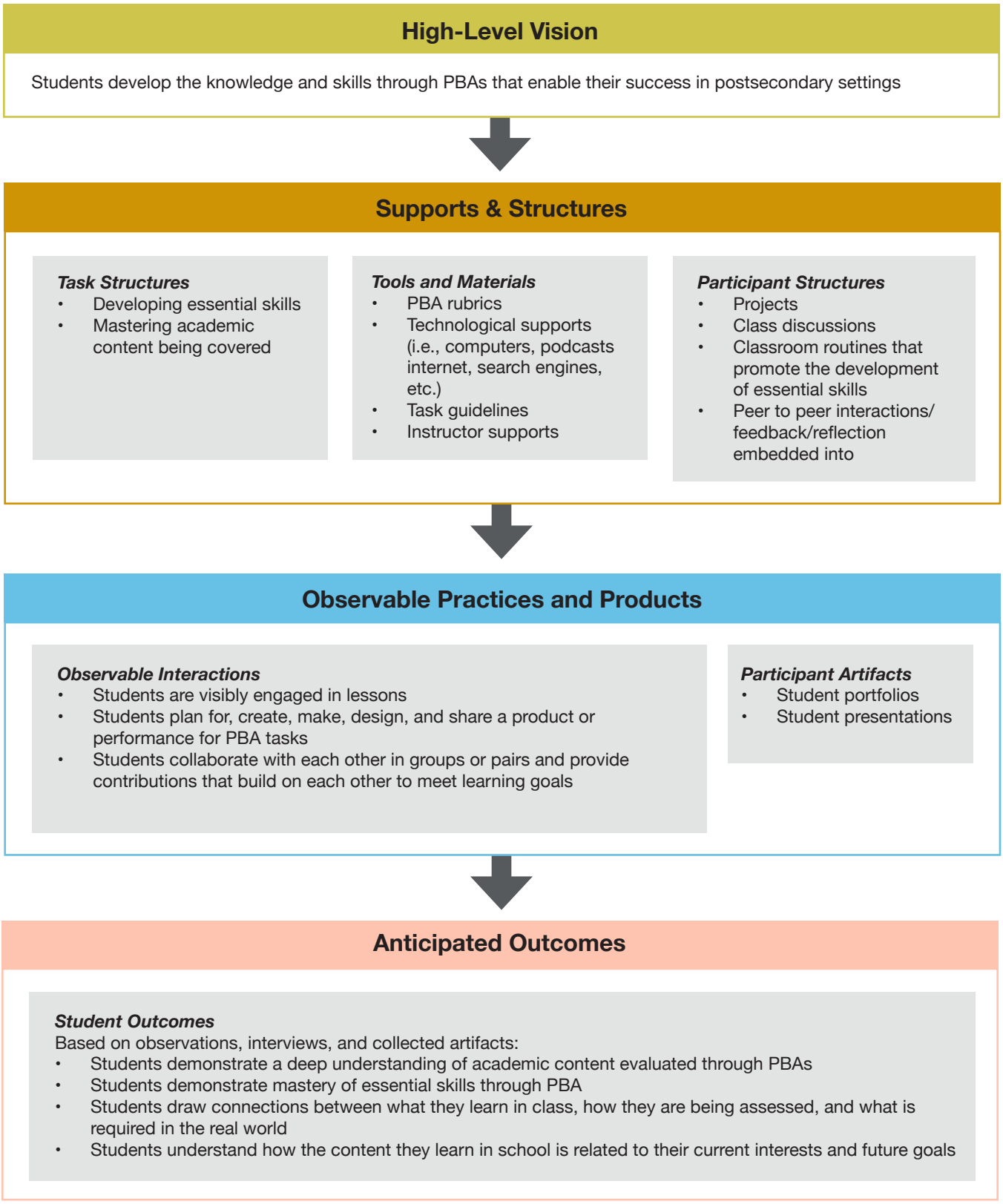
Student Conjecture Map

In the student conjecture map located in Figure 2, the High-Level Vision is that "Students develop the knowledge and skills through PBAs, that enable their success in postsecondary settings. We posit that well-designed PBAs can help foster the development of knowledge and skills needed to succeed in postsecondary and workplace settings by engaging students in meaningful and authentic learning and assessment experiences (Saye et al., 2018; Guha, 2018; Tung, 2010).

To support this vision, in the first set of conjectures ("Supports/Structures") students will receive explicit instruction and guided facilitation from teachers to engage in PBA activities and projects geared to develop essential skills that enable students to master the targeted academic content. These classroom activities aimed at cultivating essential skills along with mastering disciplinary content will prepare students for post-secondary opportunities, including a professional career. Such preparation includes students analyzing and communicating information to a wide variety of audiences, acquiring the skills to manage and complete tasks in collaborative teams, and using feedback to improve work products (Saye et al, 2018; Guha et al., 2018).

Once students access these relevant learning and assessment experiences in the classrooms, the next set of conjectures ("Observable Practices and Procedures")

Figure 2. Student conjecture map



focuses on the examples of observable practices we expect to surface from this work. We anticipate that based on the project-based nature of these PBAs, students will actively engage in lessons through their demonstrated interest and participation. We also anticipate that students will collaborate with each other in groups or pairs and offer their unique contributions while learning from other students. We hypothesize that based on these collaborations encouraged through the PBA work, we will observe a classroom environment where students respect one another as evidenced by the norms they uphold in their interactions with peers and teachers.

Lastly, in the final bottom box ("Anticipated Outcomes"), we expect that the observed behaviors and practices will eventually lead to outcomes such as students acquiring a deep understanding of the targeted academic content, students engaging in essential skills to achieve project and assessment objectives, and students drawing connections between their work and real-world applications.

Examining the Conjectures through a Multi-site Case Study

CDE partnered with the CADRE at the University of Colorado Boulder School of Education to: 1) document the experiences of teachers undertaking the complex work of using PBAs for making PWR determinations; and 2) learn whether these experiences align with the theory of change as outlined by the conjectures illustrated in Figures 1 and 2. The multi-site case study work took place at two high schools with contrasting demographics and with four veteran teachers implementing PBAs. The first school, Mulberry High*, is in an urban metro school district. The second school, Cottonwood High, is in a rural and remote area of the state. Both high schools use PBAs as part of their high school capstone efforts. The capstone consists of multifaceted projects with embedded tasks that cut across disciplinary areas. These capstone projects are designed to establish whether students are meeting PWR expectations on disciplinary content and essential skills as stated by the CAS. The information gleaned about students based on their performance on the PBAs and other student deliverables are intended to help inform teachers as to whether or not students are making adequate progress to meet graduation expectations and competencies in core content areas and as outlined by the CAS. We provide more context and details about the two sites in the second paper.

Research Questions

We developed two research questions to help guide the multi-site case study focused on the experiences of four teachers at Mulberry and Cottonwood. Due to the onset of the COVID-19 pandemic, we added two sub-questions that attended to how the health crisis intersected with each focal area. Understanding this intersection was particularly important to consider since these PBAs depend on skillfully planned classroom interactions and activities that may be difficult to execute with the pandemic in the backdrop. The research questions are:

Research Question (RQ) 1: To what extent does the ecosystem connecting all stakeholders to this PBA effort support and reinforce one another to enable the successful implementation of this work?

> 1a: To what extent did the changes brought about by COVID-19 present challenges and opportunities for the implementation of PBAs?

Research Question (RQ) 2: To what extent has the launch of the PBA effort led to more ambitious teaching

**To protect the identity of case study sites, we assigned a pseudonym to each school.*

practices and higher levels of student engagement?

2a. To what extent did the changes brought about by COVID-19 present challenges and opportunities for ambitious teaching practices and maintaining high levels of student engagement?

The ecosystem referenced in the first question refers to several levels in the educational system: the state, the district, the school and the broader community of parents and other community-based stakeholder groups. We consider this ecosystem question in terms of coherence which is needed to help stakeholders situated at each level to make connections to and provide meaningful supports for specific ideas, reforms, and initiatives (National Research Council, 2006). Coherence in a system can be understood from a vertical and horizontal standpoint. According to Shepard, et al. (2018), vertical coherence refers to the idea that all levels in the system share the same expectations and standards for assessments. Whereas horizontal coherence refers to the "conceptual integration of assessments with a shared learning model" (p. 48) within each level.

To further clarify these terms for the state and district levels, tighter vertical coherence would mean that both levels not only share the same expectations for developing these assessments but that these levels would have policies in place to support and not conflict with this work (Shepard et al., 2020). At the school level, vertical coherence would mean that school leaders provide supportive resources and structures to align with the project vision (Penuel et al., 2020) that also connects with a vision shared by the district and state. Specifically, school leaders would dedicate professional learning time with activities that support the PBA project vision and provide teachers with resources to carry out the work. Additionally, at the school level, horizontal coherence would mean that activities enacted within and across classrooms are aligned to the vision of this work so that teachers within a school are working together toward achieving the project vision (Spillane, 2002). Finally, at the community level, vertical coherence would mean that parents and the broader community support the direction taken by the school, and that the school develops ways for these stakeholders to participate or be involved in this work (Davies, 1994; Epstein, 1995).

To clarify the term "ambitious teaching practices" in the second research question, ambitious teaching entails having teachers connect classroom activities and tasks to the big ideas of a discipline and essential skills (i.e. 21st century skills) and this would lead to students acquiring the skills and knowledge to engage in authentic problems and to achieve academic learning goals (Ball & Forzani, 2009; Lampert & Granzini, 2009). As indicated in Figure 1, within the context of the PBAs, we anticipate that teachers engaged in this work will integrate the development of essential skills in their units to provide meaningful learning experiences for students that are relevant and deemed necessary for deepening content mastery (Condliffe et al., 2017). The hypothesis for this work aligns with expectations for ambitious teaching, where these learning experiences and tasks lead to: 1) more equitable and engaged learning environments for students building on prior knowledge, 2) connecting with students' lived experiences, and 3) greater student agency (Lampert & Granzini, 2009).

Two papers accompany this first paper introducing the ongoing PBA initiative sponsored by CDE. In the second paper, we describe the PBA context for each case study site and share results from addressing the first research question. The third paper focuses on results associated with the second research question and considers the implications of the overall study's findings in light of the ongoing health pandemic, and in light of ongoing assessment literacy initiatives taking place in schools and districts across the state and country.

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About CADRE

The Center for Assessment, Design, Research and Evaluation (CADRE) is housed in the School of Education at the University of Colorado Boulder. The mission of CADRE is to produce generalizable knowledge that improves the ability to assess student learning and to evaluate programs and methods that may have an effect on this learning. Projects undertaken by CADRE staff represent a collaboration with the ongoing activities in the School of Education, the University, and the broader national and international community of scholars and stakeholders involved in educational assessment and evaluation.

Please direct any questions about this project to: elena.diazb@colorado.edu.

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