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Pedagogies of Possibility: The Integration of Asset-Based Equity Pedagogies and Project-Based Learning

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ABSTRACT

While project-based learning (PjBL) and asset-based equity pedagogies (ABEPs) have traditionally been studied separately, there is reason to believe that the combination of the two strategies can produce even more impactful possibilities. This study examines the relationships between students' perception of both PjBL and ABEPs as it relates to non-academic outcomes such as problem-solving abilities, their likelihood to persist, and civic consciousness and engagement. Bivariate regression was used to determine the degree to which exposure to PjBL and ABEPs explains the variance in student outcomes. Student focus-group data confirm and expand our quantitative findings.

Keywords: *project-based learning, equity pedagogy, problem solving, civic engagement, culturally relevant pedagogy*

The purpose of education is widely debated. Citizenship scholars have long argued that the purpose of education is the cultivation of good citizens. On the other hand, some believe the purpose of education is economic mobility and others reproduction of the current society. However, what if education was more than a means to an end? What if education is about cultivating curiosity and imagination, and preparing students to imagine, design, and live in worlds that do not yet exist? Such an enterprise would require a dramatic shift in current understandings of educational outcomes, as well as current approaches to teaching and learning.

This approach to education requires the cultivation of critical consciousness – the curious lens

that prompts questioning the world as it is and recognizing the need for change. It also demands agency—a belief in one's ability to take action and create that change James Baldwin (1963), in his infamous, *Talk to Teachers*, said,

The paradox of education is precisely this—that as one begins to become conscious one begins to examine the society in which he is being educated. The purpose of education, finally, is to create in a person the ability to look at the world for himself, to make his own decisions, to say to himself this is black or this is white, to decide for himself whether there is a God in heaven or not. To ask questions of the universe, and then learn to live with those questions, is the way he achieves his own identity. But no society is really anxious to have that kind of person around. (pp. 123–124)

What Baldwin described is the essence of critical consciousness or criticality. It is not only critiquing reality as it is presented but recognizing one's ability to intervene. Paulo Freire (2014) endorsed “problem-posing education,” which stands in direct opposition to banking education (p.79). Freire (2014) explains, “whereas banking education anesthetizes and inhibits creative power, problem-posing education involves a constant unveiling of reality. The former attempts to maintain the submersion of consciousness; the latter strives for the emergence of consciousness and critical intervention in reality” (p. 81). We, the authors, recognize that nation states (while they are unwilling to admit) desire state-sponsored education to maintain the status quo by avoiding the cultivation of critical consciousness. In the current age, Giroux (2020) discusses a new, intentional crisis of illiteracy; he argues,

The new form of illiteracy does not simply constitute an absence of learning, ideas, or knowledge. Nor can it be solely attributed to what has been called the ‘smartphone society.’ On the contrary, it is the willful practice and goal [emphasis added] used to actively depoliticize people and make them complicit with the forces that impose misery and suffering on their own lives. (p. 201)

This manuscript elevates pedagogical possibility, recognizing that “pedagogy is always political because it is connected to the acquisition of agency” (Giroux, 2020, p. 206). What could come from integrating pedagogies designed to cultivate critical consciousness with pedagogies designed to cultivate 21st century skills? Drawing on the work of Chezare Warren (2021a), we attempt to imagine and model what asset-based equity pedagogies (ABEPs) and project-based learning (PjBL) pedagogies can unleash in young people. Specifically, this exploratory study illuminates the relationships between student perceptions of exposure to PjBL and ABEPs and their problem-solving abilities, their consciousness and concern for society, and their capacity for civic engagement.

Multiple Approaches to Instruction

Equity pedagogies and PjBL are often viewed as having different intentions. In particular, equity pedagogies respond to the ethnic and community-based epistemological assets that students use to make sense of academics and the world, with hopes of teaching marginalized students to navigate and transform the world around them. PjBL strategies, in contrast, have championed access to greater depth of engagement with content. As such, the research on the two instructional approaches is often found in different spaces—existing in different academic conferences (National Association for Multicultural Education vs. P[j]BL World/Deeper Learning Conference) and different interest groups within larger organizations (e.g., American Educational Research Association's SIGs Multicultural/Multiethnic Education: Theory, Research and Practice and Problem-Based and Project

Based Learning). While educators and scholars can see the potential for overlap, particularly in both approaches' emphasis on real world applicability, the integration of the two methods documented in scholarly literature is quite scant. This study explores the intersection of PjBL and equity pedagogies – a broad term we use to describe a variety of approaches that are asset-based and culturally responsive – and their impacts on the students who experience them.

Equity Pedagogy

For decades, in order to be successful academically, people of color and linguistic minorities were taught to give up their cultural identities and adopt a white, middle-class, and male-dominated culture. School culture was – and is – predominantly white, English-speaking, and middle-class. McGhee Banks and Banks (1995) define equity pedagogy as “teaching strategies and classroom environments that help students from diverse racial, ethnic, and cultural groups attain knowledge, skills, and attitudes needed to function effectively within, and help create and perpetuate, a just, humane, and democratic society” (p. 152). ABEPs, such as culturally relevant pedagogy (Ladson-Billings, 1995; Ladson-Billings, 2014), culturally responsive teaching (Gay, 2010), and culturally sustaining pedagogy (Paris, 2012) have been argued to help minimize cultural dissonance in the classroom and help students from non-mainstream cultures achieve greater success in school. Defining features of equity pedagogies include an emphasis on care and supportive learning environments; authentic assignments relevant to the real world; opportunities for cooperative learning; scaffolding; high expectations; and content connected to previous knowledge and understanding. In addition to those practices, equity pedagogies place an explicit value on the home culture in the classroom – a push to have students critically examine the world in which they live and use their knowledge to change that world for the better. Moreover, equity pedagogies are not exclusively beneficial to marginalized students but also to students from dominant backgrounds as these methods broaden cultural awareness and responsiveness (Nieto, 2000). Despite these hallmarks, Foster et al. (2020) explain that while teachers and scholars are familiar with culturally responsive teaching, less is understood by practitioners about how to employ effectively such strategies in the classroom.

Often, in practice, ABEPs are reduced to greater representation in the curriculum or tokenized in terms of foods, fashion, and festivals, especially during holidays (Skelton et al., 2002). In contrast, deep culture (Hammond, 2014) and funds of knowledge (Moll et al., 2006) are not usually centered in instruction. ABEPs are often co-opted and lose their critical edge. In fact, Ladson-Billings (2014) explains that when it comes to culturally relevant pedagogy, “few [teachers] take up the sociopolitical dimensions of the work ... I could see teachers who had good intentions. ... However, they rarely pushed students to consider critical perspectives on policies and practices that may have direct impact on their lives and communities” (pp. 77–78). This phenomenon – omitting the cultivation of critical consciousness – has led to a constant rebranding and reclamation of its critical intentions.

Muhammad (2020) outlines five pursuits in her asset-based equity framework, culturally and historically responsive teaching: skills, intellect, identity, joy, and criticality. She defines criticality as “the ability and practice of naming, researching, understanding, interrogating, and ultimately disrupting oppression (hurt, pain, or harm) in the world” (Muhammad, 2023, p.12). The emphasis on developing criticality and sociopolitical consciousness is one of the distinct differences between ABEPs and PjBL. While equity pedagogies explicitly name criticality, PjBL can be devoid of it completely unless the teacher centers the opportunity for criticality in the design of the project.

About PjBL

Real world problems, collaboration, and scaffolding are also hallmarks of PjBL. This

instructional approach uses prolonged investigations of real-world problems to drive student mastery of curricular content. Thomas (2000) outlines five primary criteria for PjBL: projects that are central to the curriculum (instead of on the periphery); driving questions that guide inquiry; prolonged investigations; student autonomy (with instructor facilitation and scaffolding); and real-world relevance. Rooted in constructivist and constructionist theories of learning, proponents of PjBL posit that pupils learn by doing and creating artifacts that can be shared with real audiences. Unlike the equity pedagogies discussed above, PjBL is more prevalent in affluent schools or gifted programs. As Metha (2014) explains,

Both inequality across schools and tracking within schools has suggested that students in more affluent schools and top tracks are given the kind of problem-solving education that befits the future managerial class, whereas students in lower tracks and higher-poverty schools are given the kind of rule-following tasks that mirror much of factory and other working-class work. To the degree that race mirrors class, these inequalities in access to deeper learning are shortchanging black and Latino students. (para. 2)

While PjBL has much promise for transforming teacher-centered, didactic approaches to education, its existence in classrooms is often limited to affluent communities. Though not the norm, some reform models use PjBL to serve students who are traditionally left out of such educational opportunities. Yet, Caires-Hurley et al. (2020) pointed out that “P[j]BL is naturally mainstream-centric,” and therefore “may not be transformative or meaningful for all learners” (p. 119). In fact, Condliffe et al.’s (2017) review summarized there are no findings to suggest that PjBL alone can support diverse learners.

Deeper learning scholars have suggested for PjBL to work well for all students, it must be combined with the elements of ABEPs. In the 2019 report from the Deeper Learning Network Series entitled, *Deeper learning networks: Taking student centered learning and equity to scale*, Hernández et al. (2019) explain what is necessary to make deeper learning mainstream. Citing neurological research, they explicate,

Optimal brain development and learning are catalyzed by affirming, responsive relationships that support attachment, psychological safety, and openness to experience. Positive relationships with adults and peers encourage students to engage their curiosities and take learning risks while mitigating the effects of adversity that many students face. (Hernández et al., 2019, p. 3)

In essence, to take deeper learning generally and PjBL specifically to scale, “a caring, culturally responsive learning community is essential, one where all students are well-known and valued” (Hernández et al., 2019, p. 3). For PjBL to be for all children—not just the gifted, white, and wealthy—equity pedagogy must be employed with it. Saavedra et al.’s (2022) randomized controlled trial measured the impact of PjBL on Advanced Placement (AP) U.S. Government and Politics and AP Environmental Science courses, compared to traditional AP instruction. Their study found that students whose teachers had access to the PjBL curriculum outperformed non-PjBL students by an estimated 10 percentage points. Duke et al. (2021) found positive impacts of PjBL on second grade students’ social studies performance.

A Perfect Union: Pedagogies of Possibility

Few examples in the literature exclusively examine the intersection of ABEPs and PjBL. Of the examples that exist, they speak in detail about the positive outcomes of the intersection of the two

methodologies. Bullock (2015) provides an in-depth case study of a high school history teacher within a PjBL school network and her use of both culturally relevant pedagogy and PjBL. After prolonged observations during the course of a U.S. History project, interviews with the teacher, and the analysis of artifacts, Bullock found evidence of real-world relevance, scaffolding, collaboration (and accountability and structure around the collaboration), positive student and teacher interactions, as well as benefits and challenges with the use of technology.

Overall, Bullock (2015) found the two approaches together, “led to higher quiz scores, assignment completion, collaboration, and engagement amongst her students” (p. 379). Even within a history class examining the antecedents of the civil war, there was little mention of intentional cultivation of criticality or sociopolitical consciousness. Bullock mentions the teacher “highlighted the importance of individuals like Harriet Beecher Stowe, Harriet Tubman, and Mary Tepe,” and that she “did not ignore the experiences of white males as she sought to include multiple perspectives about that past” (p. 373). Here we see an emphasis on content and environment absent the element of critical consciousness.

One of the other empirical examples examining the intersection of PjBL and ABEPs takes place in elementary science classrooms. Combining PjBL, culturally relevant pedagogy, and social and emotional learning, Krajcik et al. (2021) test the efficacy of a curricular design they developed, entitled Multiple Literacies in Project Based Learning (ML-PBL). In a large urban district that was 82% Black and 13% Latinx, they deployed ML-PBL in nine treatment schools and had 10 control schools. In their curricular design, each unit had a driving question, a phenomenon to be investigated, an artifact students would create, and “explicit goals to support equity that specify and underscore understandings of science and equity” (Krajcik et al., 2021, p.8). Ultimately, they found students enrolled in schools employing ML-PBL over the course of an academic year scored “significantly and substantially higher” than children in the control schools on the summative science exam. Even though pre-intervention, children in the control schools had higher reading levels when the work began (p. 14).

Warren (2021b) warns that too often in education we focus narrowly on what children can do with traditional metrics of achievement. In both of the preceding examples of empirical scholarship on the integration of ABEP and PjBL, there are traditional metrics around achievement as the outcome. Warren (2021b) argues that possibility is “detached from terms such as ‘success’ and ‘achievement’... [which] emphasize *what* Black children do, rather than *who* they are as dreamers, doers, inventors, and creatives” (p. 96). Pedagogies of possibility must prepare young people for the future they will co-create by acknowledging and celebrating the geniuses they already are. Possibility is futuristic *and* present-tense – recognizing young people as change agents right now. Pedagogies of possibility must be pedagogies of voice, “creat[ing] learning experiences that foster connection, cognitive growth, and student agency” (Safir, 2023, p. 51) as well as political pedagogies “nurturing students to think critically about their understanding of classroom knowledge and its relationship to the issue of social responsibility” (Giroux, 2020, p. 223). If ABEPs draw upon students' communal epistemologies and prepare them to navigate and transform the world and PjBL cultivates deep inquiry and problem-solving skills—one would reason their integration would produce unimaginable possibilities. The purpose of this study is to examine student perceptions of who they are (or are becoming) when exposed to pedagogies of possibility.

Method

Our research team has worked together for over seven years. In that time, we have practiced critical questioning and reflexivity with one another. Below are the positionality statements of each author.

Author Positionality Statements

Brandi Hinnant-Crawford

I am a southern, cisgender, straight, Black woman who was born into and remains a part of the fragile middle class. I grew up and around poor, Black schools. As the eldest daughter of a veteran warm-demander elementary teacher and single mom, I was raised in her classroom. I always tell people my mother introduced me to ABEPs before I had the language to describe it. I watched her love and teach children in schools who were labeled as “failing” or “bad.” Like the descriptions given by Irvine and Delpit, my mother believed equipping her students with literacy and numeracy skills, as well as the skills to navigate a world not designed for them, was a non-negotiable. I attended school where she taught; her students were my friends and peers, and we always knew the difference between the teachers who saw our possibilities and those who thought we were limited by our realities. When I became a high school English teacher (in the same feeder pattern where my mother taught first and third grade), I tried to make projects a critical part of my pedagogy. Students were not used to this approach, and scaffolds were needed, but we constantly used literature to be a precursor to creating and criticality. For instance, as they students became casting directors for a movie version of *Their Eyes Were Watching God*, we talked about colorism and how it played out within the community today. However, as a teacher, I had not been formally trained in using projects to drive learning; I was only trying to prevent boredom.

Since that time, I have learned more about both approaches to teaching, and I have employed both methodologies in the collegiate classroom, out-of-school settings, and homeschooling. In my limited experience, I have found when these approaches are employed together, the possibilities cannot be understated. The basis of my axiological interest in pedagogies of possibility has been formed in my personal experiences: running a summer camp for low-income, Black 10th–12th grade students engaged in YPAR to investigate their issues in their own community; homeschooling my Black twins during the COVID-19 pandemic, using both ABEPs and PjBL; and using PjBL in the collegiate classroom. For me, this approach is hopeful scholarship that is not mired in illusions of objectivity. I hope for liberation, and I seek to identify and describe the way public schools can be a part of it.

Emily Virtue

I am a white, cisgender, heterosexual female who grew up in a middle-class neighborhood despite my parents’ lower socioeconomic status. I attended U.S. public schools that were racially diverse, yet I often saw the White students treated better than our Black peers. I primarily research PjBL and ABEPs in middle and high school settings, where I have seen teachers move from White-centered norms to educational possibility for all students. Such observations and rapport-building with students has informed my own approach to teaching in higher education. As a researcher, I often enter classrooms knowing that White teachers engaging with a diverse classroom may center Whiteness. When we see teachers using ABEPs, I am hopeful for students. I work with my research team to confirm our observations and accurately portray what ABEPs look like in practice.

Liz Bergeron

I am a middle-aged cisgender white woman who is married with children. I grew up in a wealthy area on the East Coast, where my family went through periods of financial stability and insecurity due to family mental health issues and addiction. Despite these challenges, I had a generally happy childhood and had access to many resources. I went to a mostly white high school and didn't

realize my own privilege until I started teaching. Seeing the inequity designed into the education system pushed me to work towards dismantling racism and inequality in schools. I believe in public education and want to change a system that was designed to advance only a few.

This study sought to use our varied methodological strengths to illustrate the possibilities of educational justice in American classrooms. Author 1 and Author 3 have particular strengths in quantitative analysis, which serves as a foundation from which we build our findings. The qualitative data support and deepen our understanding of student perspective, confirming the impact ABEPs in conjunction with PjBL can make in the lives of the students.

Research Design

We used a concurrent triangulation mixed methods design to answer our research questions. In the quantitative portion, we used a correlational research design guided by the following questions:

1. To what extent, if any, does exposure to PjBL and ABEPs explain the variance in student problem-solving and citizenship?
2. How do secondary students define themselves, their skills, and their intentions when exposed to PjBL and ABEPs?

In the qualitative portion of the study, we conducted focus groups with students enrolled in PjBL reform schools as well as traditional (non-reform) high schools. Data from the focus groups were used to provide depth and clarity to the research questions above.

Sample

The data analyzed in this paper were a part of a larger evaluation study examining a reform model that encourages PjBL across the curriculum. Schools in the reform network, as well as non-network schools (within the same district), were included in this sample. This examination was not an experimental study. Because ABEPs and PjBL can happen in any classroom, we relied on students' perceptions of their exposure to the pedagogies of possibility as the covariate we explored in relationship to the outcomes we investigated. Approximately 230 high school juniors in districts with PjBL reform schools were surveyed from Michigan (61%), North Carolina (4%), and Texas (35%). The majority of the students identified as White (68%), followed by Asian (11%), Hispanic/Latinx (7%), African American (7%), Biracial (3%), and Native American (1%). Several students declined to give racial information. Of the respondents who spoke another language at home, 11% spoke a language equally with English, and 3% spoke another language exclusively. Twenty-six percent of respondents received free or reduced-price lunches.

Quantitative Data: Measuring Exposure to Instructional Approaches

Two new instruments were used to capture students' perceptions of the use of PjBL and equity pedagogy in their classrooms. Using the literature on the defining features of these instructional tools, items were created and aligned to the common features (see Table 1). The PjBL scale contained 20 items, and students rated the frequency in which they participated in a particular activity from *Never to Always* (1-5). The Asset Based Equity Pedagogy Scale (ABEPSc) contained 22 items, and students rated their agreement about the behaviors employed by their teachers, from *Never to Always* (1-5; Hinnant-Crawford et al., 2023). The ABEPSc items are organized into three constructs: *good teaching*,

warm and demanding environment, and *criticality*. Good teaching is defined using Ladson-Billings's (1995) framing in her influential article, "But That's Just Good Teaching! The case for culturally relevant pedagogy." Her article includes information on asset-based instructional practice that values and leverages students' home cultures while differentiating and providing scaffolding for all learners. Irvine (1998) describes the warm and demanding construct as follows:

[Teachers] provide a tough-minded, no-nonsense, structured, and disciplined classroom environment for kids whom society has psychologically and physically abandoned. Strongly identifying with their students and determined to give them a future, these teachers believe that culturally diverse children not only can learn but must learn. (p. 56)

Criticality includes items that measure the extent students are prepared to examine the world and identify changes to make the world better and is informed by Muhammad's (2020) historically and culturally responsive framework.

As a part of the broader evaluation study, prior to administration, the items were sent to curricular scholars with expertise in PjBL and/or expertise in ABEP for comment on the face validity of the items in each scale. Reliability analysis was conducted for each of the researcher constructed scales and illustrated sufficient internal consistency, PjBL scale $\alpha = .896$ and ABEPSc scale $\alpha = .957$. The mean score for PjBL was 3.4, $SD = .65$, and the mean for ABEPSc was 3.59, $SD = .78$.

ABEPSc Defining Feature	Related Scale Item
Good Teaching	<ul style="list-style-type: none"> • My teachers assign work that is relevant to my life. • My teachers help me connect what I am learning to what I already know.
Warm and Demanding Environment	<ul style="list-style-type: none"> • My teachers care about me. • My teachers expect greatness from me.
Criticality	<ul style="list-style-type: none"> • My teachers encourage me to imagine a better world. • My teachers encourage me to think about how to use what I am learning to create a better world.
PjBL Defining Feature	Related Scale Item
Central Questions/Problems	<ul style="list-style-type: none"> • Real life problems or questions drive my learning.
Autonomy	<ul style="list-style-type: none"> • I have a choice in the problems I investigate. • I choose the best way to investigate/solve real life problems.

Table 1. Sample Items from PjBL and ABEP Instruments

Outcomes were measured with previously established scales, all of which had reasonable reliability in this sample. Problem solving was measured with the Social Problem-Solving Index (SPSI-R) which has been validated in samples of age 13 and older (D'Zurilla & Nezu, 1990). Composite subscores were calculated in four domains: problem definition and formulation (PDF; $\alpha = .815$); generating alternative solutions (GAS; $\alpha = .822$); decision making (DM; $\alpha = .833$); and solution implementation and verification (SIV; $\alpha = .829$). The Active and Engaged Citizenship Scale was also used to measure civic duty (sense of responsibility; $\alpha = .895$) and civic skills ($\alpha = .879$; Zaff et al., 2010).

Active and engaged citizenship was operationalized by Zaff et al. (2010), describing “someone who has a sense of civic duty, feeling of social connection to their community, confidence in their abilities to effect change, as well as someone who engages in civic behaviors.” (p. 737). See Table 2 for descriptive statistics of all measures.

Scale	N	Mean	Standard Deviation
ABEPSc	224	3.59	.79
Good Teaching	224	3.36	.89
Warm & Demanding Environment	224	3.93	.84
Criticality	224	3.61	.92
PjBL	234	3.4	.66
SPSI-R-PDF	229	3.48	.83
SPSI-R-GAS	229	3.31	.84
SPSI-R-DM	229	3.39	.88
SPSI-R-SIV	229	3.26	.85
AEC-Duty	225	4.34	.79
AEC-Skills	223	3.52	.95

Table 2. Descriptive Statistics for All Scales

Data Analysis

After evaluating independent and dependent variables for violation of assumptions, a bivariate regression was used to determine the degree to which exposure to equity pedagogy and PjBL could explain variance in student outcomes. The regression model for each outcome was significant (see Tables 3 and 4).

Our analysis shows PjBL and ABEP are related to active and engaged citizenship, but they covary with different domains. The sense of responsibility to make community change is significantly predicted by ABEP but not PjBL. On the other hand, the civic skills to make a difference are related to exposure to PjBL. However, skills without the responsibility (or sense of urgency) would probably result in little action.

	Model 1: Civic Duty	Model 2: Civic Skills
Consonant	2.716**	2.045**
PjBL	.171	.391**
ABEP	.251**	.046
Student of Color	.194	-.177
Free or Reduced Lunch	.311**	.108
<i>F</i>	11.287**	5.603**
<i>R</i> ²	.17	.095

* indicates significance at $p < 0.05$ **indicates significance at $p < 0.01$

Table 3. Regression Dependent Variable Active and Engaged Citizenship

PjBL is designed to engage students in problem-solving; therefore, it is not surprising that PjBL was a significant predictor of each of the subscales in the SPSI-R. However, equity pedagogy was a significant predictor of problem definition and formulation.

	Model 1: Problem Definition and Formulation	Model 2: Generating Alternative Solutions	Model 3: Decision Making	Model 4: Solution Implementation and Verification
Consonant	1.61**	1.181**	1.504**	.925**
PjBL	.501**	.490**	.416**	.518**
ABEP	.167**	.120	.120	.145
Student of Color	.115	.100	.206	.209
Free or Reduced Lunch	.012	.076	.005	.039
<i>F</i>	18.58**	14.186**	9.796**	18.279**
<i>R</i> ²	.256	.208	.154	.25

Note. * indicates significance at $p < 0.05$ **indicates significance at $p < 0.01$

Table 4. Regression Dependent SPSI-R

These analyses provide evidence that equity pedagogy and PjBL may attribute to the variance in problem-solving and active and engaged citizenship.

Qualitative Data

Focus groups were held at each of the nine high schools visited (five reform schools and four traditional schools). Focus group participants ranged from 2–7 students per group. Participants were randomly chosen for a focus group based on parental consent. While we do not have demographic data for focus group participants, their demographic information is reported in the data from the survey that each student completed. Questions for the focus group were presented as follows:

1. Describe your favorite assignment in [school subject].
2. Who are your favorite teachers and why?
3. How do you use technology related to your school work?
4. What opportunities do you have to share your schoolwork outside of the school?
5. How do teachers at your school make coursework relevant to your lives?
6. How often do you work on group assignments?

Because of the language in the protocol was not specific to the reform model and instead more general with references to favorite assignments and opportunities to present/collaborate, students in both reform or traditional schools had the opportunity to describe projects.

Transcripts from each focus group were reviewed by one of the three researchers using initial coding to discern nuances of data. This coding scheme was used because, as Saldaña (2016) points out, codes are tentative and provisional. This method allowed researchers to code independently and come to conclusions as a team in the round that followed. After the initial round of coding, researchers combined all notes and engaged in analytic memoing (Miles et al., 2019) to determine agreement related to each code. The following themes emerged from the data analysis and researcher

conversation as we solidified code terms and went through each transcript together: vital content and relatable issues build skills; differing perspectives; grappling with complexity (productive struggle); community engagement; and evidence of possibility. We utilized language related to Warren's (2021b) research on possibility, as well as Muhammad's (2020) descriptions of facets of criticality, to name our themes. In each of these themes, an overarching theme is that of cultivating possibility. When taken in consideration with quantitative data, the qualitative data help tell the story of how students perceive the connection between PjBL and ABEPs. While the students did not use these terms, their articulation of PjBL and ABEPs gives demonstrative examples of the quantitative data.

Cultivating Possibility

Throughout the data, students indicated that their teachers created environments and assignments that kept them thinking of the future and seeing connections to their lives beyond the classroom. For instance, students recognized the ways in which they were challenged to consider different perspectives and how the development of that skill would help them later in life. One student explained, "The way you tackle problems, the way [students] have to collaborate ... it's not something you can emulate through a textbook or reading about it or watching videos. You can't emulate it." Further, students pointed to the amount of choice they have in the curriculum, particularly in English classes and what they are given to read. The ability to make choices about their own work allows the students to center what is important to them rather than what the teacher thinks they may need. Each of these pedagogical choices supports the notion of possibility, focusing on who students are "dreamers, doers, inventors, and creatives" (Warren, 2021b, p. 96).

Students spoke in depth about how classrooms were structured to lead to different outcomes, such as academic achievements and personal growth, emphasizing that teachers are frequently seen as facilitators rather than traditional instructors. The students indicated some frustration with the productive struggle teachers intentionally created for their growth. They also spoke about voice and choice, autonomy, sustained inquiry, and how teachers recognized them as full partners in the classroom and broader community.

Voice and choice came up multiple times in the focus groups and across content areas. Students explained that in even in their math courses, they were required to select and solve their own word problems. Choice seemed to lead to ownership of the content. When they were given the option for how to engage with the material, the students perceived they had autonomy over their learning experience. Such choice results in developing student agency over their own learning; greater ownership leads to greater motivation, engagement, and critical thinking (see Ryan & Deci, 2000).

In one course, students were allowed to choose their topics and teach it to the class. A young woman recounted,

We had to teach the entire class for like, the entire class period which was about an hour so we had to come up individually with different activities for our class to do and we made, like power points and stuff. And I really appreciated not only having the opportunity to do that project but watching what other kids came up with because [...] I really feel like I learned a lot from the other groups.

In this instance, the teacher shared power in the classroom by not only allowing students to choose their topics but also permitting them to facilitate the learning experience.

Students spoke frequently about how teachers would not answer questions. At times, students viewed this practice as beneficial and at other times they felt frustrated. In describing one favorite teacher, a group explained, "[The teacher] was one of those teachers that kinda leaves an impact on you after you leave. Even though he answered every question you have with a question." Another

group, also speaking of a male teacher, showed the variety in reactions to the consistent questioning:

- Student A: "He never gave me a straight answer."
- Student B: "Everybody would be mad at him just because."
- Student C: "I kind of like that, I'm not going to lie. It made me think."
- Student D: "Sometimes though, I just need an answer so I can finish this assignment."

Student C recognized this cognitive push required him to think, but the response from Student D illustrate some frustration with the approach. Another student spoke to the necessity of inquiry and the role of the facilitator but stated sometimes it felt as if the facilitator was neglecting their role as the teacher. In their description of the approach to instruction, the student almost seemed conflicted in whether they like it:

It just seems like a lot of times they will give us a subject for our project and then they just say, "Okay, you gotta do the research yourself. [...] it's all up to you guys to do it yourself." Which in a way it is kind of nice because it's not like force fed to you. You can choose what you want to do and learn but at the same time, the teacher is there to teach you, not to just sit back and watch you do it all yourselves, you know?

While appreciating the choice and autonomy, students expressed that at times they wanted more guidance from their teachers.

Repeatedly, students mentioned that teachers took seriously their ideas about how things are and how things could change. Students appreciated that teachers viewed them as participants in shaping the reality within school and beyond. Students spoke about one teacher who took note of their ideas: "[The teacher] will take notes and be like, 'How do you think we could change this?' And like, 'Why do you think we should change this?'" In another focus group, students spoke about teachers generally in their school who incorporated their ideas into changes for the school: "The teachers will be like, 'Oh, why do think this isn't working out? How do you think you can make this better?' Things are always changing, nothing is set in stone here." Students perceived their role in shaping what the school could become rather than as a static space. Students also described how teachers used content to help them think through their influence on the present and the future. In history class, a student explained,

I feel like with some of the projects and debates that we did helped us to use history and then [the teachers] wanted us to like turn it into a comparison of history versus now versus what could happen in the future. Our "is war inevitable" paper we had to write, we got to use past examples from books they had us read, and wars that we learned about and we got to think about whether or not war could become inevitable.

Vital Content and Relatable Issues Build Skills

Participants often discussed how the projects and content in class related to their lives as students, as well as what they realistically would see in their futures (both academically and in their future careers):

Everything in English is real world. Cause like, most stuff we do is relevant to the real world ... you're going to need to know how to write really well if you are trying to do something. Cause if you can't write, you can't really do nothing.

In another focus group, one student challenged another about the importance of education, specifically how education could inform their peer's future career as a sheriff:

So, you think to become a sheriff they aren't going to ask you history questions? They aren't going to ask you what you know prior to this? You gotta know stuff. When you are sheriff, you never know what is going to happen. An investigation will come up.

These findings demonstrate a student's commitment to preparation for life after high school and into postsecondary education and careers. They viewed the manner in which course material and projects were presented as a way to prepare them for the future and that such work had value in their lives. Further, students discussed building skills, such as collaboration and solving complex problems.

In addition to discussing content relevant to their own lives, participants often spoke about issues impacting the broader community and showed evidence of educators not shying away from what some would consider difficult topics. In a unit exploring war, students decided whether war was an inevitable human experience by "[interviewing] war veterans or people still in active duty but they are like home and we interviewed them and asked them what they thought about war." In a Michigan focus group, students described a project in which they struggled to recall whether the topic was human rights, civil rights, or social justice. One student detailed,

We got Women's Rights so it was really interesting to just go back and dive into where it all started and who were the initial instigators of what has now become you know the Women Equality and so that was really cool. So, other groups did things such as, there were children's rights, animal rights, geriatrics rights, and so it was really interesting and I really loved being able to go up there and present and talk about what I learned and demonstrate that.

In North Carolina, students recounted their favorite assignment in an American Studies class, which investigated different methods of protest and included the creation of a video showcasing the methods (e.g., marching, silent protest, boycotts, sit-ins, civil disobedience).

In another focus group, students discussed a project in which they re-litigated real rape cases. During the course of the assignment, they explored issues of consent, the science of DNA, and the role of race in the criminal justice system. A junior recounted,

I remember ... who did I have? I think I had one where the girl claimed that the guy raped her at the school and the police did not do any type of DNA. It was a race thing. I like ... it was a race thing because he was a bigger, black dude and she claimed that he raped her. And that never happened and years later she came forward and was like, "That didn't happen. Like I lied about it." And he was let go but the police didn't do any type of DNA testing, they didn't ... cause he ... it was graphic because we had to say all the facts, but nothing ... it just didn't add up. I was so heated during that. Talking about it, I was mad.

In biology, students also had debates on controversial issues such as abortion and stem-cell research. They were not given the option to choose their own sides, which meant exploring a variety of perspectives – a concept examined in greater detail in the theme that follows.

Differing Perspectives, Articulating Agency

Participants noted that projects, particularly in English, history, and civics classes, required them to engage in differing perspectives – ones they did not personally espouse. While some students struggled to argue perspectives different from their own, many saw value in these early experiences

and explained how having such challenges impacted future classes.

And even from then till now, like we had a discussion about gun control in one of the classes, an open discussion, and there was no fighting. There was no animosity. Everybody was listening to one another, we didn't necessarily agree with one another but it's the fact that we can sit down and have these adult conversations and not look like idiots like Hillary and Trump. {Everyone laughs.} But no, like, for real, we can communicate with each other and we're so much more tolerant and accepting of other people's ideas. Even if we don't agree we have learned to respect them.

In most schools, students pointed to their small context as an important aspect of building their skills related to working through differences.

So, like we have all of these different types of people coming together and where at a normal high school you would be separate. You'd be divided into little cliques or maybe a certain kid wouldn't feel comfortable around this kid because there is a lot of like, bullying in other schools. Like that doesn't happen here ... we're all pretty open-minded to like, if somebody is different for whatever reason, we're totally okay with it. We're like, well you're still a human, so that's all that you need.

Grappling with Complexity (Productive Struggle)

PjBL was highlighted as a way to engage in discussing complex social issues. Students noted how their learning exposed them to the complexity of being a member of society, explaining how often topics are not either/or situations but somewhere in the middle:

For example, my group had abortion and it's like, me personally, I mean I am on the fence about that. There are pros and cons on both sides and I feel like a lot of the topics that we had were like, on the fence type deals ... that's the struggle with a lot of group projects is that there are a lot of conflicting ideas that get brought into trying to make something work and so I have noticed that that really causes a lot of tension in groups.

Students went on to explain how these tensions are more common in the lower grades (i.e., ninth and tenth grades) but grappling with content (and one another) dissipates as the years progress, and they learn how to articulate themselves and work with one another. Students also connected this growth to how it relates to real-life circumstances: "It's sort of like working in a real company because you sort of have to work with everybody. You can't just like, bubble someone out and never work with them again ... you're going to have to get over your differences in order to work together to meet the goal." Students also noted that difficulty was something that motivated them to work harder:

I feel like this project wasn't really so much about the physics behind it but it was really like, sort of the ultimate test of collaboration. ... And over at the big high school, they made like, smaller examples but it's sort of like, ruins the purpose of trying to build one because, the purpose at least for this is like having the ultimate test of collaboration but for them it's just something they can put together in like, an hour or two and it doesn't really require any of those skills.

Student reflection of the process and their learning indicates that while content is important, honing their interpersonal skills and deepening their collaborative abilities is an equally important outcome of productive struggle.

Community Engagement

Many of the projects students discussed were not simply done for their teachers; they were shared with the broader community, making the assessment authentic and real-world relevant. Making use of audiences beyond the teachers for their work outcomes was a recurring theme of the projects, as shown in the following examples: (a) studying the spice trades and using the spices for making pizza to be sold at a local restaurant, (b) conducting health fairs that were evaluated by the state health department, and (c) designing vehicles assessed by individuals from the department of transportation. Students noted how they were making a difference in their community and how their projects seemed useful because it allowed them to go beyond the confines of their classrooms: “[The event is] a good educational thing but it also brings like the whole [school] family together.” Student 2 expanded, “We got to network with outside experts ... and get their help on building these trebuchets.” Student 1 summarized, “We have all our catapults out there ... and then we sell things for charity. It’s sort of part of like, how [students] give back to charity.” Another set of students documented their consistent trips to the nearby elementary and middle schools where they would present their work as an important part of their community engagement.

Evidence of Possibility

Throughout the focus groups, students spoke (unprompted) about their capabilities and what they can do. In discussing favorite teachers and favorite assignments and the overall curricular and pedagogical approach, the participants kept returning to the idea of what the environment challenged them to be and do. Within the PjBL structure, they often spoke about themselves as creators; they created and designed artifacts as a part of their coursework, leading them to identify as individuals who create. In one focus group, a student explained, “Basically, you have the ability to design your own product, whatever you want, and you can make it a 3D model and you can add measurements and lines and it’s just like, you can design an entire thing.” In another focus group in a different part of the country, we heard similar notions around the ability to create:

At the beginning, a lot of it is like the research and everything but ... our final products are presentations and videos and stuff that we make ourselves ... And in a way I kind of like that because you do have a final product that you can show. And we make it in Google Drive which saves it forever. So like, whenever you need access to it again you'll have it.

The idea of perpetual access to what they have created illustrates that the impact of the project does not simply end with the due date. The students built portfolios that showcase who they are.

In addition to being creatives, students speak in detail about their ability to communicate with different audiences. They saw their presentation skills and communication skills as an asset, built intentionally with certain activities, but also as a part their identities that they would employ in situations beyond the classroom. They spoke in detail about presenting, as one student explained, “It was hard because we had like 20 seconds for each slide and we couldn't look at the presentation, we had to look at the audience. And like, it was just one picture on the presentation.” Another student remarked, “And it couldn't have any words.” Here they speak to some of the parameters set by the teacher. In another focus group, a group of juniors spoke about their presentation skills: “Because like, I know my information, I don't need to read off a screen.” Student B concurred, “like in five minutes you can learn your part. You've learned to adapt.” Student C noted they learn “a lot of improv too!” In this exchange, the students speak not only about their presentation skills but the speed at which they can adapt and prepare to present – something they perceived as a necessary skill for their futures. Similarly, another student speaks to their readiness at any time:

We can go into any room and a teacher would tell us to present. Like sometimes our school will bring in people, kind of like you, but like, they will want to take a tour of our school so [the teacher] will call out students and they will give those people a tour around our school and that's kind of cool and we can just go on the spot.

Students were quite aware of what they are capable of due to their preparation in PjBL.

Limitations

Our study consisted of data from nine geographically diverse schools, some which employed PjBL as a signature pedagogy and a few which did not. In aggregate, students indicated positive outcomes from engaging in project-based work. Due to a relatively small sample size, we cannot state with certainty that all schools enacting PjBL alone will have similar outcomes, but evidence suggests that the enactment of PjBL coupled with criticality is promising. Ideally, one would examine this phenomenon in a context where there is an expressed commitment to both PjBL and criticality, and we hope our initial findings help encourage educators to create spaces with that dual commitment.

Significance and Implications

While we have long known the purposes of ABEPs and PjBL, this exploratory study illustrates that they may indeed deliver on those intents when provided in tandem. PjBL may actually strengthen problem-solving capabilities, and ABEP may truly contribute to greater critical consciousness. Further, enacting PjBL opportunities that are culturally relevant addresses the “urgent” need for teachers to define how they approach “educating students different from themselves” (Foster et al., 2020, p. 69). Students were drawn to and best remembered their experiences and knowledge when those elements could be linked to a specific project that was relatable and useful to them. Further, in focus groups, students were willing not only to share their experiences but critique the ways in which their teachers approached their learning. Such reflections demonstrate their criticality related not just to course content but their ability to apply it to their learning.

During the course of projects, two aspects of ABEP were consistently evident: good teaching and warm and demanding environments. As teachers (or facilitators) asked more questions of the students, rather than providing answers, and allowed students to conduct research and become experts, the rigor and demand was accompanied with psychological safety. The work was not spoon-fed to the students; however, the autonomy given, the inquiry required, and the demonstration of knowledge expected (often as a result of student choice) allowed students to acquire a confidence in their own capabilities. This confidence translated to higher scores on their capacity to define problems, generate alternative solutions, make decisions, test the efficacy of their decisions, and engage in civic activities.

The metrics we used for outcomes in the correlational portion of the concurrent triangulation design are like all instruments: they are fallible proxies for latent variables we cannot readily observe. However, given their limitations, they reveal insight about the nature of pedagogies of possibility and how possibilities emerge when ABEP and PjBL are combined. ABEP and PjBL are not mutually exclusive. For example, PjBL could be considered good teaching that also cultivates a warm and demanding environment. What ABEP adds to PjBL is the expressed commitment to criticality and critical consciousness. Critical consciousness is key for problem definition (in problem solving) and sense of civic responsibility. What impact is there from skill without the will?

Gholdy Muhammad (2020) defines criticality as “the capacity to read, write, and think in ways

of understanding power, privilege, social justice, and oppression, particularly for populations who have been historically marginalized in the world” (p. 120) and argues that all students need opportunities for developing criticality. Muhammad (2023) goes on to discuss four major categories for teaching criticality, or vital topics, related to “hurt, hate, harm, or [oppression] afflicted upon the environment ... living organisms ... the self ... [and] other humans” (p. 13). In our study, we saw evidence of criticality as students tackled real-life problems related to their own lives, in which there were no easy answers. However, most of the issues focused on oppression related to people or living organisms (e.g., one group spoke about a project on animal rights), creating an opportunity for educators to explore criticality in other areas. As evidenced in the section of this paper on Vital Content and Relatable Issues, students grappled with ideas and worked with others to think through situations of great importance. Teachers must provide opportunities for students to do such grappling. (Indeed, there is no shortage of topics, spanning all disciplines, which would allow for such opportunities to be enacted in the classroom.) In such instances, we observed Giroux’s (2020) calls come to life – teachers nurtured their students and gave them the opportunity to link the knowledge they gained in the classroom to social responsibility.

Students in our study noted how they were encouraged to think critically, work with one another in diverse groups, and apply their knowledge and understanding to see positive change in their community. These aspects came about through the intersection of equity pedagogies and PjBL environments. Warren (2021b) argues that educators can create environments of possibility for students by listening closely and “building innovative programs with youth and communities” (p. 115). Students in our study often pointed to being heard by their teachers and administrators suggesting that they (the students) did well because of their environment. Educators must create a place and space (Warren, 2021a) for students to feel seen and heard. In this study, students’ sense of agency was palpable – they were not merely students walking into a classroom each morning to ingest knowledge handed out by an instructor; rather, they were collaborators with their instructors. Students had voice in how they conducted projects, on what worked in the classroom, and in how they were assessed on their learning.

In the era of post-truth, it is essential that educators design their instruction in ways that facilitate students’ development of critical consciousness, problem-solving abilities, and agency. In this information age, literacy (in a variety of disciplines) is only the beginning. We need our students to be able to define problems, investigate and determine fact from fiction, as well as formulate and execute solutions. This is the task of education in a post truth era, and ABEP in conjunction with PjBL appears to be up to the task. As hopeful scholars, we recognize the possibility is not within the pedagogies but within the students whose genius and magic the pedagogies must launch.

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