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Emily J. Summers

Gail Dickinson

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A Longitudinal Investigation of Project–based Instruction and Student Achievement in High School Social Studies

Emily J. Summers and Gail Dickinson

Abstract

This longitudinal study focused on how project–based instruction (PBI) influenced secondary social studies students' academic achievement and promoted College and Career Readiness (CCR). We explored and compared student achievement in a PBI high school versus a traditional instruction high school within the same rural school district. While previous literature indicated that PBI involved more preparation time and a steeper learning curve for both teachers and students, we found that in high school social studies, students' achievement gains actualized within one year. PBI students outperformed peers who learned from a traditional curriculum in both social studies achievement and CCR preparedness.

Keywords: longitudinal, PBI, social studies, rural, high school

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Introduction

In this longitudinal project–based instruction (PBI) study, we examined four years of high school students' social studies achievement toward college and career readiness. We embedded our study within the context of eight years of a rural southwestern United States (US) school district's social studies achievement. PBI addressed calls for authentic inquiry (Barton & Levstik, 2004; Levstik & Barton, 2001; Wineburg, 2001), which aligned well with social studies pedagogy. However, we wondered if PBI could also account for content and grade-specific College and Career Readiness social studies standards. Mintz (2007) stated, "Doing history . . . emphasizes active, project–based learning involving the critical use of material, visual and audio primary sources." Like Mintz, we knew social studies theoretically aligned with PBI, so we were amazed that social studies PBI research was unexpectedly sparse. Finkelstein, Hanson, Huang, Hirschman, and Huang (2010) compared the effects of traditional and PBI economics curricula, finding that PBI students outscored the control group on content and problem-solving measures. In a social studies case study with younger students, Grant (2011) found that PBI helped students develop deep conceptual understandings of human rights and nurtured deep connections with other countries. Other PBI or PBL studies related to social studies focused on early childhood (Gultekin, 2005), elementary gifted students (Diffily, 2002), middle school technology-infused PBL (Hernández-Ramos & De La Paz, 2009), and twenty-first-century skills (Bell, 2010).

College and Career Readiness Standards

The 2005 US National Education Summit addressed ways to increase the number of students who graduate from high school prepared to transition successfully to college and/or careers in the increasingly competitive twenty-first-century global climate. Achieve, an independent, bipartisan, nonprofit education reform organization, served as a key partner alongside the US National Governors Association and the Council of Chief State School Officers in creating the Common Core State Standards, which later became known as the College and Career Readiness (CCR) standards. Much of the US-based CCR development came from a global comparative perspective. While enacted domestically within the US, these standards were developed based on global ideas. "Standards from the highest-performing countries on international assessments such as the Programme for International Student Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMSS) were reviewed in detail and used in the developmental process of the Common Core" (ACT, 2011, p. 4). As of 2011, 47 out of 50 US states have adopted CCR standards in math and English. Achieve (2011) reported that 20 states and the District of Columbia have established "requirements that all high school graduates must complete a college– and career–ready curriculum"

Identifying an Ideal Research Site

As of 2011, Achieve had only identified one state that utilized each of its four indicators in statewide accountability systems including: (a) the percentage of high school graduates who earn a college– and career–ready diploma, (b) obtain a readiness score on a nationally-aligned high school assessment, (c) earn college credit while still in high school, and (d) require remediation upon entering college (p. 2). We searched for a school district in that state as our research site since all of its high schools would follow the same CCR–aligned curriculum. Additionally, we opted for a research site in this specific state because it had adopted social studies CCR initiatives in addition to the suggested English language arts and math standards. Next, we narrowed our search for a school district where we could investigate if PBI facilitated the realization of the CCR standards as well as enhanced students' social studies learning.

While research indicated that PBI worked, campuses have not readily adopted inquiry methods (Beck, Czerniak, & Lumpe, 2000; Ladewski, Krajcik, & Harvey, 1994; Polman, 2000). Research also informed us that PBI presented unique challenges for teachers and students (Frank & Barzilai, 2004; Hung, 2011; Marshall, Petrosino, & Martin, 2010). However, when PBI was properly implemented, it often produced dramatic achievement gains and deep conceptual understanding (Baumgartner & Zabin, 2008; Egbert & Simich–Dudgeon, 2001; Grant & Branch, 2005; Schneider, Krajcik, Marx, & Soloway, 2002; Youngquist & Pataray–Ching, 2004).Thus, within this Achieve–identified state, we examined school districts to check for options with established PBI social studies curriculum already in place. From these choices, we selected a diverse, rural district, typical of the state, with two high school campuses that differentiated instruction based on PBI and a traditional approach. This district provided an ideal research site to investigate our hypotheses. Our study adopted the CCR viewpoint of examining how curriculum prepared students to be successful *beyond* high school instead of fixating on what students needed to graduate *from* high school.

Theoretical Framework

We hold a normative epistemology of learning achieved through communities of learners working together to solve real-world problems. This approach to research aligns with a social studies constructivist theory as the base of our PBI theoretical framework. For example, Brophy, Alleman, and Knighton (2008) highlight how social studies engages real-world, powerful ideas that strongly connect with students' cultural backgrounds and home lives, while still maintaining alignment with national standards. Bruner's (1985) explanations of constructivism, pulling from Kant, serve as a fulcrum supporting our greatest hopes for PBI within social studies contexts. Bruner, after acknowledging and echoing the foundational work of Goodman and Piaget, elaborates on constructivism saying, "the world is

not found, but made, and made according to a set of structural rules that are imposed on the flow of experience" (p. 7). We agree with this vision of constructivism in PBI. Further, we embrace a deeply rooted social (re)constructivist view of PBI as a way for students to change the world through tackling extended real-world problems within the classroom and curricular contexts.

Dewey (1916) reminds us in his *Democracy and Education*, "Since education is a social process, and there are many kinds of societies, a criterion for educational criticism and construction implies a particular social ideal" (p. 115). Praxis is the Aristotelian term for action. PBI teaches and utilizes collective action. Freire (1970) expanded educational understandings of praxis requiring that action must combine with "reflective participation" toward a shared cause. High-quality PBI within secondary social studies necessitates this type of praxis (p. 65). Arendt (1972) contends that societies can change through collective action, making her social theory highly applicable to the highest aims of PBI in social studies contexts. Thus, PBI within high school social studies contexts is especially powerful because the theoretical frames of PBI tightly align with the curricular content students are studying and enacting.

Research Questions and Hypotheses

This study examined three research questions.

1. Would the experimental (PBI curriculum) group have higher rates of promotion to the next grade level than the control (traditional curriculum) group?
2. Would students in the experimental PBI group have higher social studies achievement than the experimental group as measured by standardized assessments?
3. Finally, we aimed to investigate the more global research question. Could a PBI curriculum facilitate the realization of the CCR standards alongside enhancing students' social studies learning?

We hypothesized that the global connections and real–work aspects of PBI would significantly improve students' continued forward progress at PBI high school as compared to the control group at the traditional high school. We hypothesized that the students at the PBI high school would score significantly higher in social studies achievement exams than students at the traditional high school. Specifically, we investigated if students in the PBI social studies curriculum had greater growth toward CCR than students in the traditional social studies curricular model. Our final hypothesis was that the PBL curriculum would adequately facilitate the realization of the CCR standards alongside enhancing students' social studies learning.

Method

This longitudinal study took place in a diverse rural district with two high schools––one high school utilized a PBI curriculum while the other high school opted for a traditional curriculum. In 2010, the state considered 70% of the district's students to be low income, meaning that they qualified for free or reduced lunches.

Table 1. District Enrollment by Gender and Ethnicity

		2005–06	2006–07	2007–08	2008–09	2009–10
Ethnicity	African American	26.6%	26.9%	26.8%	25.9%	26.0%
	Asian/Pacific Islander	1.7%	1.6%	––	2.3%	2.3%
	Hispanic	53.6%	55.9%	57.5%	58.7%	59.1%
	Native American	0.2%	0.1%	––	0.1%	0.2%
	White	18.0%	15.6%	13.6%	13.0%	12.4%
Gender	Female	48.8%	48.8%	48.9%	48.7%	49.3%
	Male	51.2%	51.2%	51.1%	51.3%	50.7%

In 2007, in response to unacceptable ratings on state accountability measures, the district in this study established a technology– and science–focused high school utilizing PBI instruction in all content areas. PBI, as it was enacted in the high school that became the focus of our study, emphasized sustained inquiry, collaborative work, in–depth concept exploration, and work products communicating results through a variety of media. The PBI instruction was taught and aligned across disciplines. This school opened in 2007 with a population of 156 freshmen and sophomores selected based on interest and a lottery, which aided in reducing selection threats to validity. In 2008 and each subsequent year, the district admitted approximately an additional 100 new freshmen to the secondary PBI campus. In keeping with CCR goals, the high school required students to take 12 credits (one semester) of early college start courses and complete a senior internship in addition to the state graduation requirements. The district's only other high school adhered to traditional state requirements.

Before embarking on a study of students' achievement, we documented the educators' expertise and correct PBI usage (Dickinson, Summers, & Jackson, 2010). We examined academic achievement and grade–level retention in the newly formed PBI high school. As a comparison, we utilized the same district's traditional high school that did not incorporate PBI in meeting CCR goals. By adding the district's traditional high school we were more equipped to understand if PBI contributed to significant differences in students' academic achievement in social studies, as measured by the state's standardized assess-

ment. We implemented a randomized longitudinal design (treatment group: R O . . . O X O . . . O; control group: R O . . . O O . . . O). This type of longitudinal design was needed in student achievement research, but it was rarely applied in many areas of educational research (Teddlie, Reynolds, & Sammons, 2000).

We chose this district as our field site because of its uniqueness of having two high schools with similar populations whose main difference was the curriculum. The experimental group of students attended the high school that offered a PBI curriculum, while the other high school with the control group of students adhered to the district's traditional way of educating with no emphasis on project–based instruction. The two high schools were only 201 meters apart. The students in the study had attended a common middle school, shared the same rural community, and shared one football team, one marching band, one choir, among other activities; thus, the vast similarities between groups reduced selection concerns and balanced any mortality. The only core difference between the two groups of students was their high school, which was differentiated by the curriculum/method of instruction. This helped reduce the effect of multiple treatment interference, history, maturation, instrumentation, and interaction of factors. The control group was exposed to all conditions of the study except the experimental variable.

We conducted ongoing classroom observations to confirm that each school taught the curriculum model it purported to use. We referred to the single campus that existed before the two high school split by instructional design as One HS, indicating the time when all students in this district went to one high school. We assigned the pseudonym Trad HS to the high school that offered traditional instruction and we ascribed the pseudonym PBI HS to the high school that offered project–based instruction. We relied on the state's official testing data to determine if the social studies instruction and CCR learning at PBI HS created a significant difference in its students' learning outcomes. Data on individual and school characteristics came from district records.

Qualitative Triangulation

The integrated social interactions and exchanges between both campuses and beyond the schools within the rural community helped to maintain homogeneous factors between the students at each uniquely modeled curricular campus, thus increasing validity and reducing maturation threats. Arguably, these commonalities also could have provided opportunities for one instructional input to travel to students at the other high school campus. However, since tutoring and all other academic contexts were held exclusively within each campus, we observed little curricular cross–contamination. In mixed campus social events, the high school students tended to focus on the social aspects of being a teenager. In over four years of observing students in this academically split, but socially united, community, we never observed a student bring up curricular methods of instruc-

tion outside of academic contexts. These qualitative measures were in place to reduce threats to validity. Unlike many short-term, limited-context PBI studies, this longitudinal examination and our prolonged engagement in the research sites observing PBI and traditional teaching presented across disciplines over four years retained the strengths of its experimental design while also reducing novelty, disruption, experimenter effects, and the interaction of history and treatment effects.

Analysis

We investigated if students in the PBI social studies curriculum had greater growth toward CCR than students in the traditional social studies curricular model. Our study accounted for students' prior achievement to reduce alternate explanations for students' social studies growth. The longitudinal design provided some degree of control over stable characteristics of students by using students as their own controls. We utilized descriptive statistics, z–scores, and demographic analyses to investigate differences in students' social studies achievement and persistence toward CCR between the PBI and traditional campuses. We analyzed qualitative data to triangulate with quantitative results through open coding (Denzin & Lincoln, 2011).

Results

Findings revealed higher and more positive CCR learning outcomes for students who learned via PBI than for students who learned via traditional methods of instruction. In interviews and informal interactions, teachers from PBI HS spoke at length about increased planning time; however, they felt positively about their PBI instruction, their students' learning, and students' abilities to engage with CCR standards (Dickinson, Summers, & Jackson, 2010). This article's scope mostly focused on quantitative findings; however, the numeric achievement outcomes triangulated with our interview and classroom observation data for students in PBI classrooms who consistently identified as global citizens and who could easily translate other content areas into geographical and historical perspectives.

The Importance of Examining Contextual Longitudinal Data

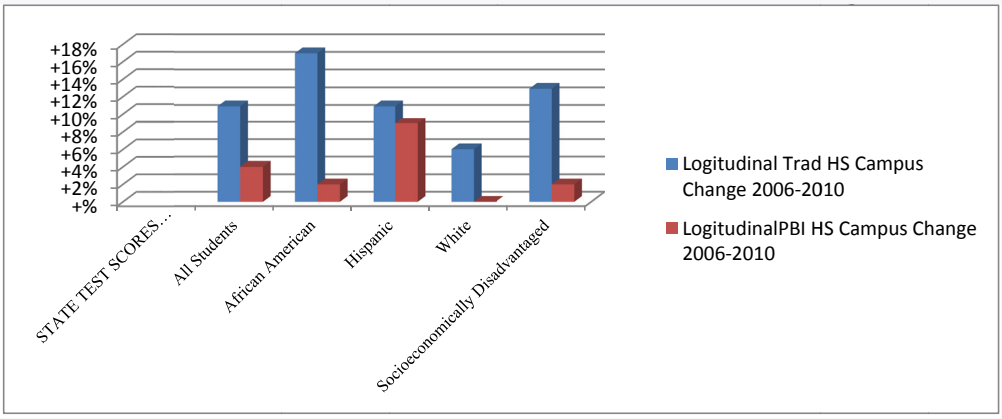
We included Charts 1, 2, and 3 to show why we found that social studies PBI data were best understood through examining longitudinal and contextual data. The comparison of these results both refined and challenged our understandings of the academic PBI literature. The literature indicated that PBI implementation took time for teachers to master (Frank & Barzilai, 2004; Ladewski, Krajcik, & Harvey, 1994; Marx et al., 2004; Polman, 2000; Toolin, 2004). Likewise, the literature reminded us that PBI also required a while for students to show increases in learning (Frank & Barzilai, 2004; Marx et al., 2004; Polman,

2000; Schneider et al., 2002). One of our key decisions focused on determining how much longitudinal data were needed to answer our research questions.

Since much of the literature on PBI indicated that it would take time for students to experience achievement results, we initially began examining four-year longitudinal achievement gains. Chart 1 limited our viewpoint so as only to encompass learning growth in year one through year four at the PBI HS and the Trad HS. This analysis and presentation of data only indicated students' social studies achievement *since* the inception of the PBI high school, which was not long enough or comparative enough, as it did not account for first year gains; it showed only growth and did not indicate actual achievement. If we relied only on Chart 1, we would have concluded that Trad HS students' social studies learning *grew* more than the PBI students over these four years of testing data. We have worked extensively with both high schools, thus we were pleased to see this growth; however, this finding did not adequately reflect what we had observed and heard in our qualitative field visits to both campuses. Only when we went back and looked at a longer longitudinal slice of data did we realize that the most dramatic increases in PBI social studies learning occurred during the first year of students' PBI instruction, which stood in contrast to many prominent studies on PBI.

Since the most substantial learning *gains* in social studies ensued in year one on the PBI campus, we did two things. First, we examined more achievement data from a time period before the campuses divided. Secondly, we took a closer year–by–year look at the students' comparative social studies achievement, not just their growth.

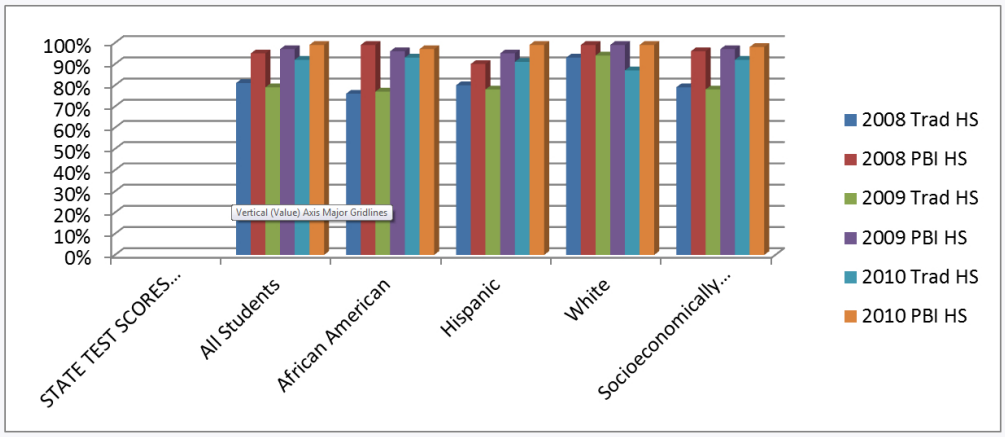
Chart 1. Student Increases in Social Studies Achievement Years 1 through 4



We thus expanded Chart 1 to report year–by–year social studies achievement at both campuses, as indicated on Chart 2. This increased data view exposed that PBI HS had the highest social studies pass rates for all students (99%), as well as for African American (97%), Hispanic (99%), White (>99%), and "socioeconomically disadvantaged" (98%) sub-

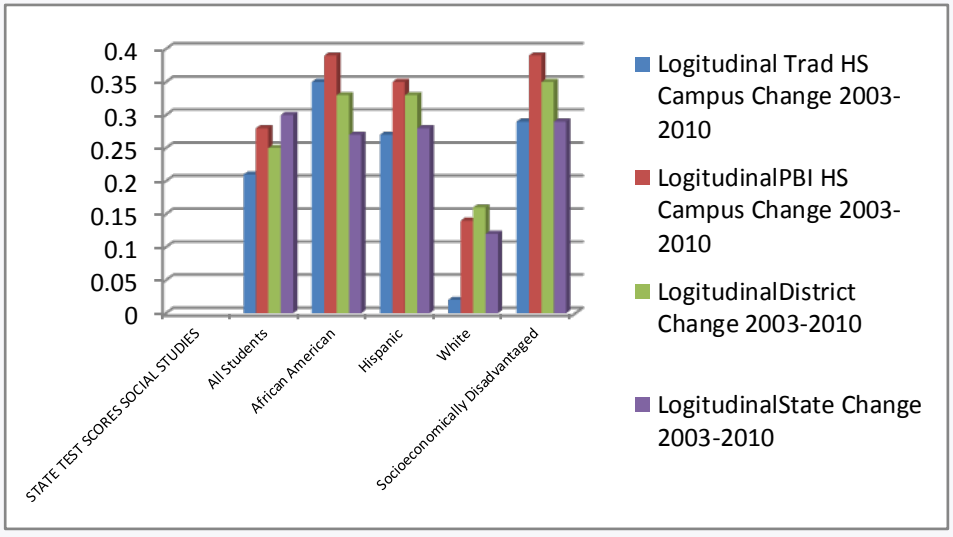
groups in 2010. Both high schools admirably had very high social studies pass rates for 2008–2010 (see Chart 2 and Table 1).

Chart 2. Three Years of Comparative Social Studies Achievement (% Passing) by Campus



Next, we increased the spectrum of our longitudinal look at students' social studies achievement comparing PBI HS and Trad HS with each other as well as to students' social studies achievement in their district and their state. Chart 3 provided a seven-year look at students' social studies achievement growth from 2003 through 2010.

Chart 3. Comparative Longitudinal Change in Students' Social Studies Achievement (% Passing) by Demographics, 2003–2010



PBI HS had more positive achievement growth for African American, Hispanic, and for students coded as socioeconomically disadvantaged than Trad HS, the district, or the state averages. We found that PBI worked better for the students who were most marginalized from the traditional US education system.

Differences by Campus: Z–Scores and Significance

Background, Special Circumstances, and Data Limitations

While the year–to–year PBI HS student achievement results and seven-year longitudinal findings were promising, we wanted to uncover if the achievement variances between campuses were significant differences. We included charts to make the findings more meaningful to a variety of audiences. However, since both campuses' students demonstrated admirable social studies achievement, we needed to know more about the differences. Additionally, because of our CCR interests, we also investigated the students' retention rates. The literature and our own research informed us that PBI was difficult for many students, so we naturally wondered if the social studies achievement scores were artificially high because student attrition from PBI HS was also high. PBI HS filled its campus a year at a time starting with only a freshman and sophomore class. Consequently, we had to make some choices about how to analyze our data. For these data to make sense across campuses, we opted for tables with descriptive statistics. Additionally, since the sizes of the campuses varied, but still carried a large number of students from a common population, we elected to calculate Z–scores to investigate significant differences. Since PBI HS did not have a class of graduating seniors until 2010, the state had no dropout scores for that campus. To work around this, we utilized grade–level retention scores.

Definitions and Calculations. The *p* value is the probability, under the null hypothesis, of observing a value as extreme or more extreme of the test statistic where is the sample mean, $\mu = m$ is the hypothesized population mean, σ is the population standard deviation, and *n* is the sample size. Under the null hypothesis, the test statistic, , will have a standard normal distribution, $N(0,1)$. Utilizing the state's standardized formula, we determined grade–level retention by comparing a student's grade level in the spring of one school year to the student's grade level in the fall of the next school year (see below).

$$\text{grade–level retention rate} = \frac{\text{number of students enrolled in the same grade from one school year to the next}}{\text{number of students enrolled from one school year who return the next year or who graduate}} \times 100$$

While this study included retention rates dating back to 2003, the state in which this study was located changed the definitions and calculations for dropout rates in 2007; thus, we opted to report retention rates from 2007 onward. For the state, grade-level retention was the percentage of students who failed to make forward academic progress from one year to the next, which generally translated to the percent of students repeating the same grade level.

Grade–level Retention

We had two important reasons for reporting retention by grade level. First, the PBI high school did not have its first graduating class until 2010. Hence, all retention data before 2010 for PBI HS was nonexistent. A (––) demarcation was used to represent these nonexistent PBI HS scores while still allowing us to report the available Trad HS data. Secondly, all students from both high schools came from a common middle school campus (MS) and the former common high school (One HS) that existed before the division; both MS and One HS had longitudinal data applicable to the district and its learning contexts. We included the average retention for all students on each campus as well as the retention rates for each grade in 2008–2009. While there was no senior class for this year at PBI HS yet, it was the most complete school year that we had access to all needed variables. We still opted to include 12th grade rates for Trad HS in Table 2, even though we could not provide any comparative PBI HS senior data. Per the state's formula, the lower the number was the better the campus did to ensure students' forward academic progress.

Table 2. Grade–Level Retention, by Grade, 2008–2009, 1–Tail

Grade	Trad HS %	PBI HS %	PBI Difference	Z–Score	Actual Confidence Level (1–Tail Z–Test)
Total	10.5	1.3	9.2	5.385*	100%
Grade 9	11.9	1.1	10.8	3.263*	99%
Grade 10	6.8	2.2	4.6	1.584	94.3
Grade 11	12.2	1	12.2	2.917*	99.8
Grade 12	12.9	––	––	––	––

PBI HS had a significantly higher grade–level retention rate for grades 9 and 11 than Trad HS. The overall retention rate was also significantly higher for PBI HS than for Trad HS; however, that was calculated without PBI HS yet having a graduating class. Consequently, these data will need to be revisited.

We further delineated data by subgroups[1] in Table 3 to understand the significant differences between PBI HS and Trad HS. Due to the size of the table, we opted to eliminate the total campus retention and the 12th grade retention since PBI HS did not yet have a senior class. We hypothesized that the global connections and real–work aspects of PBI would significantly improve students' continued and seamless forward progress at PBI HS. While we wanted to test this hypothesis, thankfully, both high schools in this district did so well in reducing with grade–level retention in this area that there were no significant differences.

Which Student Subgroup Benefited Most from PBI Instruction?

The only sub–population of students whose grade–level retention was significantly better across all measured grades at PBI HS than at Trad HS was in career and technical education, as shown on Table 3. This made sense to us for several reasons. Primarily, PBI and CTE authentically went together.

Table 3. Grade–Level Retention, by Grade and by Sub–Populations, 2008–2009

Student Subgroup	Grade	Trad HS Rate (%)	PBI HS Rate (%)	PBI Difference	Z–Score	Actual Confidence Level (1–Tail Z–Test)
At–risk	Grade 9	8.7	3.1	5.6	1.714*	95.7
	Grade 10	6.7	4.4	2.3	0.583	72
	Grade 11	11.1	1.1	10	2.712*	99.7
Career & Technical Education (CTE)	Grade 9	10.2	1	10.2	2.887*	99.8
	Grade 10	7.1	0.9	6.17	2.109*	98.3
	Grade 11	11.3	1.1	11.3	2.788*	99.7
English as a Second Language	Grade 9	6.5	16.7	–10.2	2.801*	99.7
	Grade 10	4.2	0.9	4.2	1.295	90.2
	Grade 11	17.4	0.9	17.4	3.795*	100
Immigrant	Total	4.3	0.32	4.3	3.222*	99.9
Limited English proficient	Grade 9	10.7	16.7	–6	1.433*	92.4
	Grade 10	15.1	0.93	15.1	3.74*	100
	Grade 11	18.5	0.9	18.5	3.957*	100
Special education	Grade 9	15.6	14.3	1.3	0.183	57.3
	Grade 10	11.1	0.93	10.17	3.01*	99.9
	Grade 11	18.4	9	18.4	3.957*	100
Title I	Grade 9	13.3	0.88	13.3	3.556*	100
	Grade 10	6.3	0.93	6.3	1.899*	97.1
	Grade 11	0.36	1.1	–0.74	0.014	50.6

Additionally, PBI's emphasis on real–world problems and applications naturally fit with students who chose the CTE options. Finally, the rural context of the school placed a high value on the advanced technology that was integrated into PBI HS.

Retention, PBI, and Language

The grade–level retention findings gave us concern about the intersectionality of new freshmen who were adjusting to high school while also mastering English and the new PBI style of curriculum. Despite this concern, freshmen English language learners (ELL), which the state labeled as English as a second language (ESL) and/or limited English proficient (LEP), had significantly higher grade-level retention in PBI HS than in Trad HS for both 10th and 11th grade students labeled as LEP and for 11th grade students labeled as ESL. Interestingly, there were no significant differences between grade–level retention at either campus for 10th grade students labeled as ESL.

Whereas freshman ELLs experienced significantly higher rates of forward academic progress at Trad HS than at PBI HS, we were pleased to find that ELLs were persistent enough to find eventual success at PBI HS. This was consistent with Strobel and van Barneveld's (2009) conclusion that "PBL instruction was effective when it came to long-term retention and performance improvement. PBL students were overall slightly underperforming when it came to short-term retention" (55). Our findings indicated that if students labeled as ELL stayed at the PBI campus, they advanced grades more easily once they became upperclassmen. This indicated PBI success from a future–oriented CCR viewpoint since PBI HS eventually promoted these students at significantly higher rates than Trad HS. What works for geographic and linguistic newcomers also serves curricular newcomers, which would encompass the entire PBI HS freshmen population.

Qualitative Triangulation

Since we observed greater levels of student social interaction and integration at Trad HS than at PBI HS, we hypothesized that this contributed to the significant differences in freshman retention rates. Qualitative findings triangulated with this hypothesis, revealing through open coding (Denzin & Lincoln, 2011) that Trad HS freshmen consistently emphasized their social interactions as positive. In contrast, PBI HS freshmen were split on whether their campus' social interactions were positive or negative. Many PBI HS freshmen disliked and/or did not trust the close peer–group instructional work inherent in PBI curriculum. Contract grading, which included peer enforcement of rules and peer assessment was an "undesirable," "harmful," and "forced peer–to–peer exchange" in the words of many PBI freshmen.

While one of the authors occasionally utilized Spanish at both high schools, Spanish was more commonly heard and seen at Trad HS. Although neither researcher recalled

hearing any languages besides Spanish and English at either campus, youth–centered language, expressions, and cultures were overwhelmingly more open and abundant at Trad HS. The heterogeneity of expression at Trad HS may have assisted freshman ELLs to engage, learn, and be move onward to become Trad HS sophomores. One female student athlete who was not labeled as ELL in high school, but who was a native Spanish speaker told us about her decision to transfer from PBI HS to Trad HS after her freshman year. She did very well academically at PBI HS her freshman year and equally as well academically at Trad HS her sophomore and junior years. Even though she transferred campuses to be on the campus that "housed her athletic practices," she mostly expressed a desire for greater cultural heterogeneity and "more ways to have fun and interact" than PBI HS offered her.

Retention, PBI, and Special Education

There were no significant differences in freshman grade–level retention between the campuses for students receiving special education services.[2] Nevertheless, PBI benefited students in special education programs in showing significantly higher grade–level progress for them in 10th and 11th grade, which kept them on track for CCR. Akin to ELLs, students receiving special education services did not experience the PBI advancements that other subgroups did in their freshman year.

PBI and Diversity based on Students' Race/Ethnicity and Socioeconomic Backgrounds

We included Table 4 to acknowledge the diverging gap between the populations at the two campuses. We utilized Chart 5 to visually show the diversity growth by campus. Though our findings told us many things about how PBI was working for students and teachers compared to the Trad HS curriculum, increasing differences in the percentages of students based on race/ethnicity[3] and socioeconomic classifications raised more questions than answers.

Table 4. Student Demographics of One HS, Trad HS, and PBI HS

	2003	2004	2005	2006	2007	2008		2009		2010	
	One HS	One HS	One HS	One HS	One HS	Trad HS	PBI HS	Trad HS	PBI HS	Trad HS	PBI HS
African American	21%	21%	26%	30%	30%	32%	24%	34%	22%	35%	21.9%
Hispanic	44%	45%	45%	44%	49%	49%	47%	53%	44%	55%	44.1%
White	34%	33%	27%	25%	20%	17%	29%	12%	33%	9%	32.2%

While we uncovered many positive PBI outcomes, we could not equalize for the socio-economic differences between the two high school campuses without returning to the start of our study to utilize a matched–pair design. We opted to employ this design from 2010 forward.

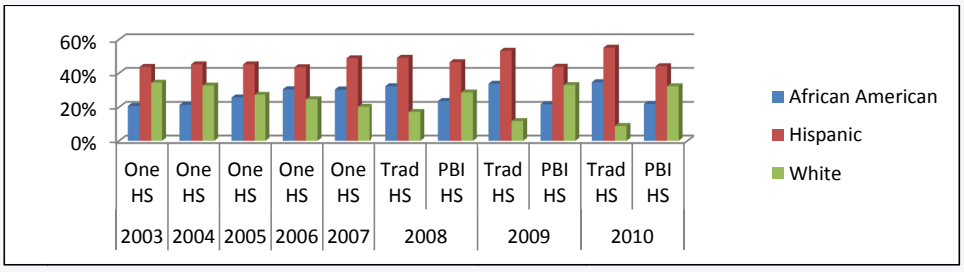
Table 5 further allowed us to show the increasing disparity between PBI HS and Trad HS in terms of the socioeconomic composition of each school.

Table 5. Differences by Campus in Students Labeled Socioeconomically Disadvantaged[4]

2003	2004	2005	2006	2007	2008		2009		2010	
One HS	One HS	One HS	One HS	One HS	Trad HS	PBI HS	Trad HS	PBI HS	Trad HS	PBI HS
53%	55%	56%	60%	63%	60%	54%	72%	56%	80%	57%

We examined grade-level retention by socioeconomic classifications anticipating that we would not find any significant differences between the campuses. All students in the district who were ready to enroll in grades 9 through 12 were eligible to enter a raffle with a chance to attend PBI HS. So, while the demographics between the campuses were not equal, the PBI students were randomly selected after being stratified by sex. Due to the random selection process for enrollment, we were greatly surprised by the demographic differences.

Chart 5. Student Demographics of One HS, Trad HS, and PBI HS



We created Table 6 to indicate both campuses' grade–level retention by what the state terms "economically disadvantaged." As in previous reporting, there were no 12th grade data for PBI HS.

Table 6. Grade–level Retention for Students Labeled as Economically Disadvantaged, 2008–2009

Grade	Trad HS Rate (%)	PBI HS Rate (%)	PBI Difference	Z–Score	Actual Confidence Level (1–Tail Z–Test)
Grade 9	9.3	2.2	7.1	2.231*	98.7
Grade 10	6.2	3.8	2.4	0.663	74.6
Grade 11	11.2	1.1	10.1	2.828*	99.8
Grade 12	12	––	––	––	––
Total	9.2	2.4	6.8	3.852*	100

Grade–level retention significantly differed between campuses for grades 9 and 11, as well as in the overall retention across grade levels. Student interviews revealed that PBI fused with CCR was a powerful motivator and offered hope to many students who aspired to be the first in their family to attend college.

PBI Social Studies Achievement

We hypothesized, based on our observations, that the students at PBI HS would score significantly higher in social studies achievement than students at Trad HS at the commended level. However, we expected both campuses to do very well on the state–mandated standardized exam passing level. We provided the district's US history scores at the eighth grade level, labeled as MS in Table 7, to provide historical context to the high school scores.

The state where this study was located mandated standardized social studies testing at the 8th grade, 10th grade, and exit level, which generally fell at 11th grade for most students. We included historical longitudinal pass and commended rates in Table 7, in addition to offering statistical calculations to test for significant differences in the campuses' scores. A significantly higher percentage of PBI students scored at the pass and commended levels for all three applicable testing years than their counterparts at Trad HS. At the exit level, PBI students had a significantly higher percent of passing and being commended in 2009; however, despite sustained high achievement from PBI HS students, there was not a significant difference at the exit level in 2010 due to dramatic increases in the Trad HS scores. In 2010, students at PBI HS still significantly outscored Trad HS students at the commended level on the exit social studies exam.

These results indicated that both traditional and PBI methods led students to high social studies achievement. Nevertheless, based solely on demonstrating social studies learning as measured by the state-mandated exam, students who received PBI instruction significantly outscored the students who received traditional social studies instruction.

Table 7. Differences by Campus in Social Studies Achievement

	8th Grade	10th Grade				Exit Level			
	%	% Trad HS	% PBI HS	**Z Score**	**Actual Confidence Level (1–Tail Test)**	% Trad HS	% PBI HS	**Z Score**	**Actual Confidence Level (1–Tail Test)**
2005	MS	One HS				One HS			
Passed	73	77		––	––	89%		––	––
Commended	8	19		––	––	17%		––	––
2006	MS	One HS				One HS			
Passed	57	70%		––	––	93%		––	––
Commended	10	17%		––	––	22%		––	––
2007	MS	One HS				One HS			
Passed	76	84		––	––	92		––	––
Commended	13	16		––	––	30		––	––
2008	MS								
Passed	80	70	96	3.464*	100	91	––	––	––
Commended	21	12	36	2.334*	99	25	––	––	––
2009	MS								
Passed	91	74	97	4.58*	100	86	98	1.918*	97.2
Commended	37	16	53	6.945*	100	20	65	5.656*	100
2010	MS								
Passed	93	88	99	2.745*	99.7	95	99	0.828	79.6
Commended	31	12	39	5.037*	100	23	63	6.317*	100

Since the state in which this study took place overtly aligned its assessment with CCR, we also concluded that students from the PBI campus indicated better preparedness in social studies skills for college and postsecondary careers.

Conclusions and Implications

PBI provided a rigorous alternative to traditional instruction and increased students' academic achievement and forward progress toward CCR. In response to our research questions, the experimental (PBI curriculum) group had higher rates of promotion to the next grade level than the control (traditional curriculum) group. The students in the experimental PBI group had higher social studies achievement than the experimental group as measured by standardized assessments. Additionally, we found that the PBI curriculum facilitated the realization of the CCR standards alongside enhancing students' social studies learning. Our results echoed Doppelt's (2003) findings regarding the influence of PBI on previously low-achieving students so that they succeeded with distinction

in the same matriculation exams as high-achieving students. Social studies had been an underrepresented content area in the PBI literature.

Our research added student academic achievement evidence to help fill the PBI social studies gap. However, our research also had limitations. Our results were mitigated by the inequitable distribution of socioeconomically disadvantaged students between the two campuses. Further, one campus became richly more diverse than the other did over the course of the study. We were disheartened that a randomized drawing would lead away from equity in the demographics of each campus and so we recommended increasing parental/guardian awareness about the benefits of PBI instruction in Spanish as well as in English. We would like to witness an increase in the diversity of students whose names are submitted to the PBI lottery drawing. In future studies, we plan to utilize matched pairs of students to substantiate stronger claims. Additionally, we are committed to studying how augmentations to PBI curriculum can reproduce the later high school years' successes for all freshman PBI students, especially for those who identify as ELL. Beckett (2009) acknowledged that PBI created opportunities for in-depth learning, while emphasizing the mixed PBI evaluation results from students who are ELLs. These students' frustrations paralleled some of the experiences of students in our study who also had academic difficulties in the PBI school. More research is needed address PBI and ELLs in secondary schools.

At several junctures of writing and reporting our results, colleagues encouraged us to consider refraining from reporting our findings by subpopulations to more tightly focus our results. Our examination of diverse student subgroups mattered because of issues concerning the intersectionality of equity and achievement. This aspect of our study directly derived from our social (re)constructivist theoretical framework. We found that PBI worked better than traditional instruction for the students who were most marginalized from the traditional US education system. That matters to us as researchers and to our view of educational equity. Researchers worldwide struggle with how to change traditional instructional approaches to engage equity and strive to educate a wider range of students (Bishop, Berryman, Cavanagh, & Teddy, 2009; Gray & Hackling, 2009). In line with Govaris and Kaldi's (2012) work with project-based instruction aimed at enhancing cultural diversity at the elementary school level, we suggest PBI as a possible solution for secondary schools, especially in social studies classrooms. Since the district in this study had students who immigrated to the US from a wide variety of countries who were included in these subgroup successes, our findings may translate to address using PBI to improve students' educational outcomes beyond the US.

We continue to study PBI because we think it has great potential to promote equity in education. Likewise, we are drawn to CCR because of its reconstructionist underpinnings. We caution educators and researchers to remember that random does not mean equal and that ensuring randomness is often highly unrelated to equity. Based on our

findings, educators should be confident utilizing PBI in secondary social studies education. In terms of CCR, our findings concurred with Strobel and van Barneveld's (2009) meta-analysis results showing that long-term knowledge retention favored PBI over traditional methods of instruction. As more states in the US opt to enact the four Achieve indicators, more districts with both PBI and traditional campuses will meet the CCR criteria as worthy field sites, enabling even more social studies PBI research. We encourage educators and educational researchers to continue investigating curricular and research designs that inspire and offer promise of equity within educational contexts, but to also report results, alongside their equity limitations, even when they do not bear the fruits that we hypothesized and hoped they would.

Notes

1. The language of student racial, ethnic, and subgroupings is endemic to the predetermined state classifications; none of the rigid classifications reflect the authors' wording.

2. Special education is a program that serves students with disabilities. Special education programs include special education instructional and related services programs and general education programs using special education support services, supplementary aids, and other special arrangements [Source: 2008-2009 PEIMS Data Standards].

3. The language of student racial, ethnic, and subgroupings is endemic to the predetermined state classifications; none of the rigid classifications reflect the authors' wording. Students in state where this study was conducted are only allowed to be classified as: (a) American Indian or Alaskan Native; (b) Asian or Pacific Islander; (c) Black, not of Hispanic origin; (d)Hispanic; (e)White, not of Hispanic origin [Source: 2008-2009 PEIMS Data Standards].

4. An economically disadvantaged student is defined as one who is eligible for free or reduced-price meals under the National School Lunch and Child Nutrition Program [Source: 2008-2009 PEIMS Data Standards]

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Emily J. Summers is an associate professor at Texas State University-San Marcos Her scholarship emphasizes issues of equity in education including studying children and youth cultures as well as the intersections of formal and informal cultures in constructing educative experiences. Correspondence concerning this article should be addressed to Emily J. Summers, Texas State University—San Marcos, Department of Curriculum and Instruction, 601 University Dr., San Marcos, TX 78666; E-mail: ejsummers@txstate.edu.

Gail Dickinson is an assistant professor of Science Education at Texas State University-San Marcos. Her academic background includes a BA in biology and history from the University of Delaware, a teaching certificate from the University of Oregon, and an MS in Instructional Technology from Utah State University. She received her PhD from the University of Texas at Austin. Her research focuses on project-based instruction, simulations and technology in science concept attainment and problem solving, and factors affecting science teacher recruitment and retention.