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SPECIAL ISSUE: UNPACKING THE ROLE OF ASSESSMENT IN PROBLEM- AND PROJECT-BASED LEARNING

Project-Based Learning (Pjbl) in Three Southeastern Public Schools: Academic, Behavioral, and Social-Emotional Outcomes

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ABSTRACT

Project-based learning (PjBL) as a PK–12 instructional model is growing nationwide. PjBL is seen as a mechanism to deliver academic content in a more engaging way for students and in a way that stresses the development of skills critical to success in the 21st-century workforce. Because of its increasing popularity and the disparate breadth of research around the model, a study of PjBL in three southeastern public schools was conducted during academic years 2015–2016 and 2016–2017. This study attempted to better understand how PjBL was implemented in schools and to explore the impact of PjBL on schools, teachers, and students. Data collection included classroom observations, educator surveys, student surveys, and an analysis of academic and behavioral outcomes and a subset of social-emotional skills. Findings did not reveal consistent significant differences in the performances of PjBL and non-PjBL demographically matched students on academic and behavioral outcomes. PjBL students did, however, perform better on inventories of social-emotional skills. In addition, while PjBL implementation challenges are apparent, perceptions of students and educators of the impact and possibilities of PjBL are quite positive.

Keywords: project-based learning, academic outcomes, behavioral outcomes, social-emotional outcomes, deeper learning skills

Introduction and Literature Review

Defining PjBL

Clearly defining what constitutes PjBL is difficult (Condliffe, 2017; Thomas, 2000). Most recently, the Buck Institute for Education has devised what it calls "Gold Standard PjBL" that defines PjBL by student learning goals, essential project design elements, and PjBL teaching practices. It stresses that PjBL should develop key knowledge and understanding of academic curricula in students while cultivating career readiness skills. Project designs must: be centered around a challenging problem or question; require sustained inquiry that lasts beyond a few days; be authentic with real-world engagement; allow students some degree of autonomy and encourage student voice and choice; include formal reflection pieces; involve critique and revision with feedback from peers, real-world actors, and teachers; and conclude with a public product, whether that be a tangible model or presentation on possible solutions or answers to the problem or question, with the audience including invested community members (Larmer & Mergendoller, 2015). Other researchers also have proposed key design principles necessary for PjBL, with some focusing on the application of PjBL in certain subject areas (Darling-Hammond et al., 2008; Grant, 2002; Krajcik & Shin, 2014; Parker et al., 2013; Parker et al., 2011; Ravitz, 2010; Thomas, 2000).

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PjBL and Student Outcomes

Various studies have investigated the ways in which PjBL can influence student performance in specific curriculum areas. Summers and Dickinson (2012) conducted a study to compare the social studies and college and career readiness success rates of high school students in a PjBL technology high school and a traditional high school. This four-year longitudinal study found that PjBI students scored higher on social studies standardized tests and had higher levels of promotion to the next grade level than did traditional students. Mergendoller, Maxwell, and Bellisimo (2006) compared the effectiveness of PjBL and traditional instructional approaches in developing high school students' macroeconomics knowledge in the context of their verbal ability, interest in economics, preference for group work, and problem-solving efficacy. Results showed that PjBL increased students' macroeconomic competencies compared to traditional methods. Furthermore, the study found that students with low to midrange verbal abilities learned more in PjBL classes than they did in lecture or discussion classes. Additionally, PjBL students with high motivation to learn macroeconomics learned more than similarly motivated students in traditional classrooms. Another study examined the impact of PjBL on the ability of high achieving high schoolers in Israel to design and implement solutions for technology-based problems. The experimental group included 60 high-achieving students involved in PjBL and the control group was comprised of 60 similar students from technology high schools. Pre- and post-tests showed a faster rate of improvement in technological knowledge for students engaged in PjBL compared to those in traditional classes. Other results showed positive changes in attitude toward technology and higher levels of performance in design skills among PjBL students (Mioduser & Betzer, 2007).

PjBL is also thought to develop students' cognitive and affective skills while being a way to equalize student outcomes. Alacapinar (2008) used qualitative and quantitative analysis, including a video-recorded semistructured interview, to study PjBL students in comparison to a control group of students. Results indicated that PjBL students had a higher cognitive domain and reported that PjBL enriched their creativity while enhancing their ability to collaborate in trusting relationships with peers. Another study found benefits of PjBL in urban public school STEM instruction. Geier et al. (2008) followed approximately 5,000 students in two cohorts of seventh and eighth graders in the Detroit Public Schools. PjBL students showed significantly higher pass rates on the state standardized science test as well as increases in their science content understanding and process skills compared to nonmatched control group peers. These gains remained up to a year and a half after students' participation in PjBL. Higher levels of participation in the project-based curriculum also were associated with higher achievement scores. Additionally, Kanter and Konstantopoulos (2010) found that PjBL science curriculum improved science achievement among minority students, although not improving their personal attitudes and future interests in science. Research also has looked to PjBL as a way to help ESL students gain proficient English abilities while building knowledge and language skills in the content areas (Eslami & Garver, 2013). Other studies also have pointed to the benefits of PjBL on students with disabilities (Parsi, 2017). This research provides evidence for the argument that PjBL may equalize opportunities and outcomes for disadvantaged students, especially in areas where they have previously been underrepresented.

PjBL Models

The New Tech Network (NTN) Design is a model that uses PjBL as its primary pedagogical approach. A small number of past studies have investigated the efficacy of the NTN design. A 2013 case study of one NTN school suggested that the application of PjBL created an instructional environment that positively impacted student learning, relationships, and technology use and appeared to improve student self-efficacy (Lynch et al., 2013). Academic achievement and college and career readiness outcomes also were analyzed as a part of a federal Investment in Innovation project evaluation between 2015 and 2017. The study concluded, in its last year with the largest number of students included, that NTN ninth graders outperformed demographically similar control students on end-of-course mathematics and English Language Arts (ELA) assessments and that, while there were null findings on some outcomes, NTN 11th graders outperformed control students on ACT composite scores and on workforce skills outcomes measured by ACT WorkKeys (Culclasure, Odell, & Stocks, 2017). Further, a mixed-methods study conducted by the American Institutes for Research (2014) analyzed the aggregate outcomes of 10 schools implementing deeper learning practices, one of which was an NTN school implementing PjBL. The study concluded that, compared to similar students in non–deeper learning schools, treatment students scored higher on all three reading, mathematics, and science PISA assessments; scored higher on the state ELA and mathematics tests; reported higher levels of interpersonal and intrapersonal competencies, such as collaboration, academic engagement, motivation to learn, and self-efficacy; and were more likely to graduate from high school on time, enroll in four-year postsecondary institutions, and enroll in selective institutions (Huberman, Bitter, Anthony, & O'Day, 2014). More recently, the 2018 internal NTN Report on School and Student Success reported a 94%

high school graduation rate among students in NTN schools with an 83% persistence rate in college of NTN graduates at two- and four-year institutions.

Gaps in Research

The variances within the literature review evidences specific outcomes of PjBL in some key content areas and with some specific subsets of students. it also describes a common definition of PjBL and its successful implementation across the literature. However, the research does not provide any study that seeks to examine pedagogy and learning outcomes across the entire K–12 academic spectrum by observing an elementary, middle, and high school using the same tools, methods, and surveys independent of one content area or area of emphasis. The following study attempts to articulate such a methodological approach.

Study Design, Research Questions, and Conceptual Framework

This two-year study took place in three southeastern United States public schools—one elementary school, one middle school, and one high school. Enrollment for the elementary school was 645 students with 48% being female and 52% being male. Approximately 6% were black or African American, 83% were Caucasian, and 2% were Hispanic or Latino. Its poverty index was 66%. Enrollment for the middle school was 860 students with 48% being female and 52% being male. Approximately 56% were black or African American, 36% were Caucasian, and 4% were Hispanic or Latino. Its poverty index was 58%. Enrollment for the high school was 857 with 50% being female and 50% being male. Approximately 41% were black or African American, 48% were Caucasian, and 8% were Hispanic or Latino. Its poverty index was 67%.

Data collection was multifaceted and included an analysis of student academic and behavioral outcomes, such as standardized test scores and number of discipline incidents, and a subset of social-emotional outcomes, such as development of communication and collaboration skills, as well as classroom observations and surveys to explore PjBL implementation and perception of impact.

Researchers sought to answer the following questions during this study:

1. To what extent are three public schools in the southeastern United States implementing PjBL with fidelity to PjBL best practices and pedagogy as defined in the literature?
2. How do students learning in three PjBL public schools in the southeastern United States perform on assessments of a subset of social-emotional outcomes? How do the performances of these students differ from that of a normed sample?
3. To what extent do demographically similar students learning in three PjBL public schools in the southeastern United States differ from students learning in traditional settings on academic and behavioral outcomes?
4. What are educator and student perceptions in three public schools in the southeastern United States of the impact of PjBL?

In order to conceptualize PjBL and how the current study is measuring the expected outcomes of PjBL implementation, see Figure 1 for the project logic model. The assumptions at the top of the logic model frame the expected overall outcome of implementation of PjBL with fidelity. The inputs sections on the left side of the logic model define the critical components of PjBL, as described in the literature, along with the inputs measurement tools used in the current study. The third and fourth blocks define the key social-emotional outcomes expected with implementation of PjBL and the measurement tools used in the current study. The fourth block displays the student performance or academic outcomes expected with the implementation of PjBL, and the block to the far right describes the overall impact of implementation of PjBL with fidelity.

Methods and Results

Because methods of data collection and analysis were varied for each of these research questions, they are addressed separately in the section that follows.

Research Question One: Implementation Fidelity

Methods. Participating schools' fidelity to the PjBL model was measured by results from randomly selected classroom observations and by teacher and student survey findings. Observations were conducted in 12 classrooms—four at the elementary school level, four at the middle school level, and four at the high school level. PjBL content area experts across the state served as classroom observers after in-depth training on the instrument and protocol. The instrument utilized during classroom observations was written by researchers and PjBL experts using the most recent research, and also was used in a PjBL state certification program to train educators on authentic PjBL implementation. Prior to use in this study,

Assumptions
Project-Based Learning [PjBL] is an educational practice that, if implemented with fidelity to best practices and with in-depth training and ongoing professional development, leads to better development of the knowledge, skills and characteristics necessary for students to improve academic performance, ensure success in college and the workplace, and foster life-long learning

Inputs	Inputs: Measurement Tools	Skills and Characteristics Measurable Outcomes	Skills and Characteristics Measurement Tools	Student Performance Measurable	Overall Impact of PjBL
Principal Trained in PjBL Practices and Delivery	Principal Implementation Surveys	Increased Development of Creativity and Innovation	Improved Performance on DESSA Assessment	Increased Student Measure of Academic Progress (MAP) Test Gains	A learning environment that leads to better development of the skills and characteristics necessary for students to improve academic performance, help ensure success in college and the workplace, and foster life-long learning
Teachers Trained in PjBL Practices and Delivery					
PjBL-Related Materials in Classrooms		Increased Development of Critical Thinking and Problem Solving Skills			
Classroom Arrangement Conducive to Multi-Arrangements and Groupings	Classroom Observations				
Multiple Student Groupings Used During Class Activities		Increased Development of Collaboration and Teamwork		Increased Student Proficiency Levels on Standardized Tests	
Teachers Working in Teams					
Fully Developed Real-World Projects Aligned With State Standards	Teacher Surveys	Increased Development of Self-Direction			
Involved Community Partners (Project Development, Project Presentations)					
Permeation of PjBl Practices Across All Learning Platforms				Decreased Student Disciplinary Referrals, In-School Suspension Rates, and Out-of-School Suspension Rates	
School/Classroom Equipped with Integrative Technology	Student Survey	Increased Development of Interpersonal Skills			

Figure 1. Logic model for the project-based learning study.

the observation instrument was piloted and calibrated, and interrater reliability was established. The observation instrument included a five-item checklist based on the observer's initial impression of the classroom environment, as well as a formal rubric of performance criteria based on six key PjBL strategies including: authentic inquiry; academic rigor of content standards; applied learning and collaborative problem-solving; exploring the need to know; connecting to an audience; and authentic assessment that includes reflection and revision. Once classroom observations were conducted, results were scored in a way that provided individual scores for the observer's "first impression" and for the observed performance criteria. These two scores were then combined to form a total score for each classroom observed. Please see Appendix A for the classroom-level observation instrument and protocol utilized by researchers to assess PjBL implementation fidelity.

Results. After analyzing data from classroom observations, researchers concluded that two of the schools were at mid- to high-range PjBL implementation and one was at low- to mid-level of implementation. Table 1 and Table 2 display a breakdown of results.

	Teachers Facilitating Not Lecturing	Multiple Student Groupings	PjBL-Related Materials Evident	Environment Functionally Suited to PjBL	Students Engaged	Total Score
School 1	88%	100%	100%	100%	100%	98%
School 2	100%	88%	100%	100%	100%	98%
School 3	85%	90%	67%	95%	80%	84%
Avg Score	91%	93%	89%	98%	93%	

**Percentages above were derived from the ratio of points earned (meets expectations = 5; approaches expectations = 2.5; does not meet expectations = 0)/possible total points.*

Table 1. PjBL "first impression" checklist scores by level and item.

	Planning for Standards-Based PjBL Instruction	Authentic Inquiry	Academic Rigor of Standards	Applied Learning and Collaborative Problem-Solving	Exploring the Need to Know	Connecting to an Audience	Authentic Assessment Includes Reflection and Revision	Total Score
School 1	75%	88%	100%	75%	100%	88%	88%	88%
School 2	88%	88%	100%	100%	100%	75%	75%	89%
School 3	67%	82%	87%	85%	86%	66%	80%	79%
Avg Score	77%	86%	96%	87%	96%	81%	81%	

**Percentages above were derived from the ratio of points earned (meets expectations = 5; approaches expectations = 2.5; does not meet expectations = 0)/possible total points.*

Table 2. PjBL observation rubric scores by level and performance criteria.

While there was variation among schools, particularly in school 3, Tables 1 and 2 show that the most challenging aspects of authentic implementation for the three schools in aggregate was planning for standards-based PjBL instruction and authentic assessment of student work. Alternatively, the academic rigor of the standards and exploring the need to know scored particularly high in aggregate.

While implementation findings show that the three study schools were making varying but steady progress implementing authentic PjBl in academic year 2015–2016, there were several stumbling blocks in academic year 2016–2017 that resulted in two of the schools ceasing implementation by the end of the academic year. Informal interviews subsequently conducted with school principals revealed that the main reasons for ceasing implementation included the pressure associated with testing, the minimal amount of district support provided for PjBl implementation, and the lack of full understanding of the PjBL model and the complexities of implementation.

Research Question Two: Social-Emotional Outcomes

Methods. In order to measure social-emotional outcomes, teachers who were randomly selected for classroom observation also were asked to complete the Deveraux Student Strengths Assessment (DESSA) on each of their students at the end of the academic year. The DESSA is a validated, online teacher inventory that measures eight social-emotional competencies identified in research as essential to a child's success in school and life: self-awareness; social awareness; self-management; relationships skills; goal-directed behavior; personal responsibility; decision-making; and optimistic thinking (LeBuffe, Shapiro, & Naglieri, 2009). The DESSA includes 72 items and is a standardized, norm-referenced behavior rating scale that assesses the social-emotional competencies that serve as protective factors for children in kindergarten through the eighth grade. The standardization sample used to make this comparison consisted of children who are representative of the U.S. population with respect to gender, race, Hispanic ethnicity, region of residence, and poverty status. Please see Appendix B for technical information about the DESSA. Due to implementation issues described above, data on social-emotional outcomes was only collected during academic year 2015–2016. Additionally, the DESSA only was administered to elementary and middle school students since it is not validated for use with high school students. The total number of students assessed at all grade levels was 181.

Results. In terms of scoring, a high T-score (60 and above) on a competency indicates that this competency is a "strength" for that student. A T-score between 41 and 59 is described as being "typical" for a student of that age. Low T-scores (40 and below) mean that students are lacking in that particular competency. Each T-score is a standard score set to have a mean of 50 and standard deviation of 10 (LeBuffe et al., 2009). Percentile scores, which also are provided, compare the child's behavior to that of other children that age who have been rated using the DESSA.

The combined social-emotional composite score (average of all eight competencies measured) of students rated in this study is 52 of 60 possible points, with a percentile score of 56%. Raw scores are converted to percentile scores using the appropriate norms tables. Percentile scores compare the child's behavior to that of other children who have been rated using the DESSA. The percentile score indicates the percentage of children in the standardization sample who earned the same or lower raw score.

Thus, when compared to other similar aged children across the country rated using the DESSA, the majority of students at participating elementary and middle schools scored higher that other students nationwide. Figure 2 displays the breakdown for the study sample.

The DESSA also breaks out scores by competency. Table 3 displays a breakdown of scores by competency, followed by a description of the competencies and how students in the study fared on each competency.

Personal Responsibility. Personal responsibility is the tendency to be careful and reliable in one's actions and in contributing to group efforts. At PjBL elementary and middle schools in the study, 30% of the students who were assessed received a "strength" rating for this competency; 52% received a "typical" rating. The average educator score for this competency was 52. From the standardization sample, 55% earned the same or lower score.

Optimistic Thinking. Optimistic thinking is a child's attitude of confidence, hopefulness, and positive thinking regarding herself/himself and her/his life situations in the past, present, and future. At Oakland Elementary, 30% of the students who were assessed received a "strength" rating for this competency; 52% received a "typical" rating. The average educator score for this competency was 53. From the standardization sample, 54% earned the same or lower score.

Goal-Directed Behavior. Goal-directed behavior is defined as a child's initiation of, and persistence in completing, tasks of varying difficulty. At Oakland Elementary, 28% of the students who were assessed received a "strength" rating for this competency; 48% received a "typical" rating. The average educator score for this competency was 50. From the standardization sample, 50% earned the same or lower score.

Social Awareness. Defined as the capacity to interact with others in a way that shows respect for their ideas and behaviors, social awareness recognizes one's impact on them,

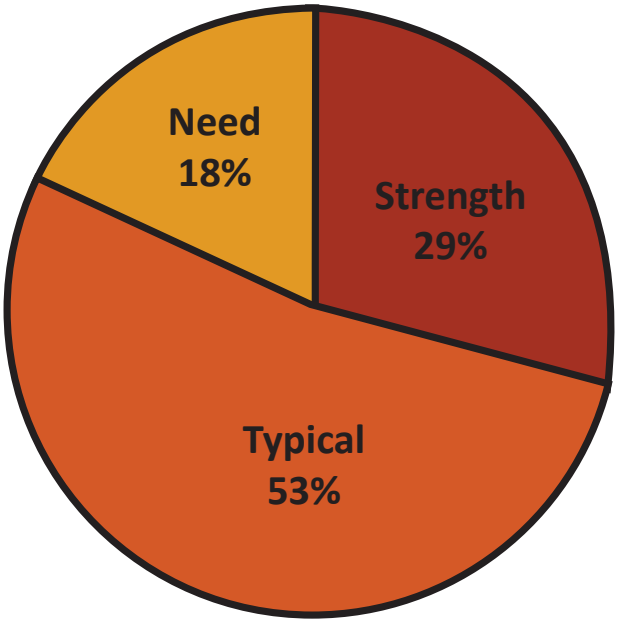

Figure 2. PjBL student's DESSA overall scores summary.

	Personal Responsibility	Optimistic Thinking	Goal Directed Behavior	Social Awareness	Decision-Making	Relationship Skills	Self-Awareness	Self-Management	Social-Emotional Composite
Average Educator T-Score	52	52	50	54	53	53	52	53	52
Percentile Score	55%	54%	50%	59%	57%	58%	56%	58%	56%
Students With "Strength" Ratings	29%	30%	28%	41%	33%	35%	28%	32%	29%
Students With "Typical" Ratings	52%	52%	48%	39%	54%	48%	59%	51%	53%
Students With "Need" Ratings	19%	18%	25%	20%	13%	18%	13%	17%	18%

Table 3. DESSA competencies scores summary.

and uses cooperation and tolerance in social situations. At selected PjBL elementary and middle schools, 41% of the students who were assessed received a "strength" rating for this competency; 39% received a "typical" rating. The average educator score for this competency was 54. From the standardization sample, 59% earned the same or lower score.

Decision-Making. Decision-making is a child's approach to problem solving that involves learning from others and from her/his own previous experiences, using her/his values to guide her/his action, and accepting responsibility for her/his decisions. At selected PjBL elementary and middle schools, 33% of the students who were assessed received a "strength" rating for this competency; 46% received a "typical" rating. The average educator score for this competency was 53. From the standardization sample, 57% earned the same or lower score.

Relationship Skills. Relationship skills measure a child's consistent performance of socially acceptable actions that promote and maintain positive connections with others. At Oakland Elementary, 67% of the students who were assessed received a "strength" rating for this competency; 48% received a "typical" rating. The average educator score for this competency was 53. From the standardization sample, 58% earned the same or lower score.

Self-Awareness. Self-awareness is a child's realistic understanding of her/his strengths and limitations and consistent desire for self-improvement. At selected PjBL elementary and middle schools, 28% of the students who were assessed received a "strength" rating on this competency; 59% received a "typical" rating. The average educator score for this competency was 52. From the standardization sample, 56% earned the same or lower score.

Self-Management. Self-management measures success in controlling emotions and behaviors and in completing a task or succeeding in a new or challenging situation. At Oakland Elementary, 32% of the students who were assessed received a "strength" rating for this competency; 50% received a typical rating. The average educator score for this competency was 53. From the standardization sample, 58% earned the same or lower score.

Each DESSA T-score is a standard score set to have a mean of 50 and standard deviation of 10. Like the percentile scores, T-scores are based on the ratings received by the children in the standardization sample. In contrast to percentile scores, however, DESSA T-scores have the same meaning throughout their range. Educators provided the highest T-score ratings for social awareness and the lowest ratings for goal-directed behavior.

Research Question Three: Academic and Behavioral Outcomes

Methods. Academic and behavioral outcomes were assessed by analyzing and comparing English Language Arts (ELA) and mathematics state standardized test scores, along with out-of-school suspension (OSS), in-school suspension (ISS), and behavioral referral numbers for grades three through eight. Researchers requested and received these data from the state department of education, which houses these data in the state's PowerSchool database. For mathematics, ELA, and the behavioral outcomes, researchers conducted an exact-matched, case-control sample. This "exact matching" procedure is widely used by statisticians in studies such as this one (Iacus, King, & Porro, 2011, 2012). The 1,421 eligible PjBL students were matched to a non-PjBL student on the basis of grade, poverty indicator, race, special education indicator, English as a second language indicator, and gender. The control cases were selected at random among eligible matches. Therefore, researchers examined the percentage of students in each category across and within schools during the observation window. Because of the implementation issues in two of the three schools during 2016–2017, this academic year was excluded from academic and behavioral outcomes

	PjBL Students	Control Non-PjBL Students	Difference
ELA PASS Scores	1616.328	1616.728	-.399
Mathematics PASS Scores	1614.683	1617.59	-2.907

p < .05; p < .01; p < .001

Table 4. **Unconditional differences in academic outcomes.**

analyses. After the matching procedure was completed, average ELA scores, mathematics scores, and behavioral reports were calculated for each group. The statistical significance between these averages was tested using an independent samples *t*-test in Stata 15. The differences were also tested using ordinary least squares regression with a robust estimator to adjust for unobserved similarities at the school level (Rogers, 1983).

Results. Researchers found no statistically significant differences in ELA and mathematics state standardized test scores for PjBL students as compared to demographically matched non-PjBL students. The average ELA score for PjBL students was 1,616 (SD = 174), while for non-PjBL students it was 1,617 (SD = 174). Similarly, the average mathematics score for PjBL students was 1,615 (SD = 170) and 1,617 (SD = 171) for non-PjBL students. Neither of these differences were statistically significant at $p < .05$. Table 4 displays a breakdown of academic outcomes.

There was, however, a significant PjBL advantage (a greater number) with OSS and referral numbers, but a disadvantage (a smaller number) with ISS numbers when comparing similar PjBL and non-PjBL students. Students in PjBL schools had significantly greater in-school suspensions but significantly fewer out-of-school suspensions. Specifically, PjBL students averaged .686 (SD = 1.711) in-school suspensions per year, compared to non-PjBL students who averaged only .398 (SD = 1.267) such suspensions per year. For out-of-school suspensions, PjBL students averaged .170 (SD = .646) per year, compared to non-PjBL students who averaged .267 (SD = 1.030) per year. PjBL students had significantly lower discipline incident reports, averaging .996 (SD = 2.271) per year compared to non-PjBL students' average of 1.224 (SD = 3.318). While all of these differences do achieve statistical significance at the $p < .05$ level, the magnitude of these differences is very small, all being less than 1 suspension or report. Note that the overall averages on these behavioral issues is relatively low, so even such minor differences could be meaningful. Table 5 displays a breakdown of behavioral outcomes.

Research Question Four: Student and Educator Perceptions

Methods. Perceptions of the impact of PjBL were evaluated using an anonymous online survey distributed to both educators and students. Nearly 100 educators responded to the educator survey, yielding a response rate of 63%. Of these, 26 were elementary school teachers, 38 were middle school teachers, and 34 were high school teachers. For students, in elementary school, an anonymous student survey was administered to third and fourth graders; in middle school, it was administered to students in grades six, seven, and eight; and in high school it was administered to ninth and tenth graders. Over 850 students responded to the survey. Of these, 210 were elementary school students, 586 were middle school students, and 81 were high school students. See Appendix C for the student survey instrument and Appendix D for the teacher survey instrument.

Results. The majority of students had a positive opinion of PjBl; they reported that they had more of a say in their learning when participating in PjBl and that they learned more when participating in PjBl compared to non-PjBl. In general, most students enjoyed PjBl and felt excited about participating in PjBl in the classroom. Additionally, most students reported that participating in PjBl helped them respect people who have different opinions and work through conflict in a peaceful way. They also reported feeling comfortable presenting their work in front of other people, having the ability to manage their time, setting realistic goals for themselves, and learning important problem-solving skills because of their participation in PjBl. Most students reported that their teachers were using PjBl as the primary teaching method most or all of the time and were being taught using PjBL for two years or more. PjBL was reported as being most widely used by science teachers, and most infrequently used by foreign language teachers. Figure 3 provides a snapshot of student perceptions of PjBL.

	PjBL Students	Control Non-PjBL Students	Difference
Number of In-School Suspension	.686	.352	.334***
Number of Out-of-School Suspensions	.170	.251	-.081**
Discipline Incident Reports	.996	1.185	.189*

*$p < .05$; **$p < .01$; ***$p < .001$

Table 5. **Unconditional differences in behavioral outcomes.**

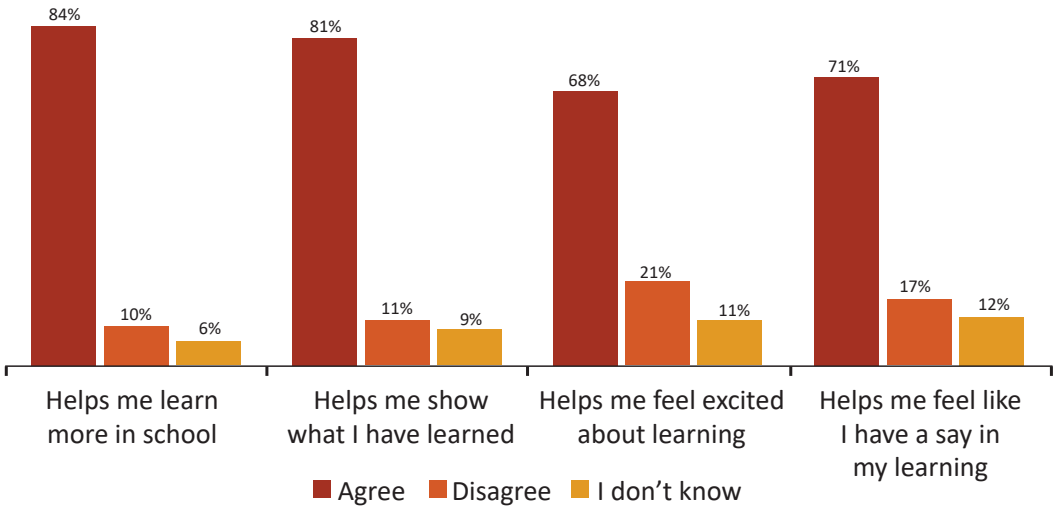

Figure 3. Student perceptions of PjBL's effectiveness on learning.

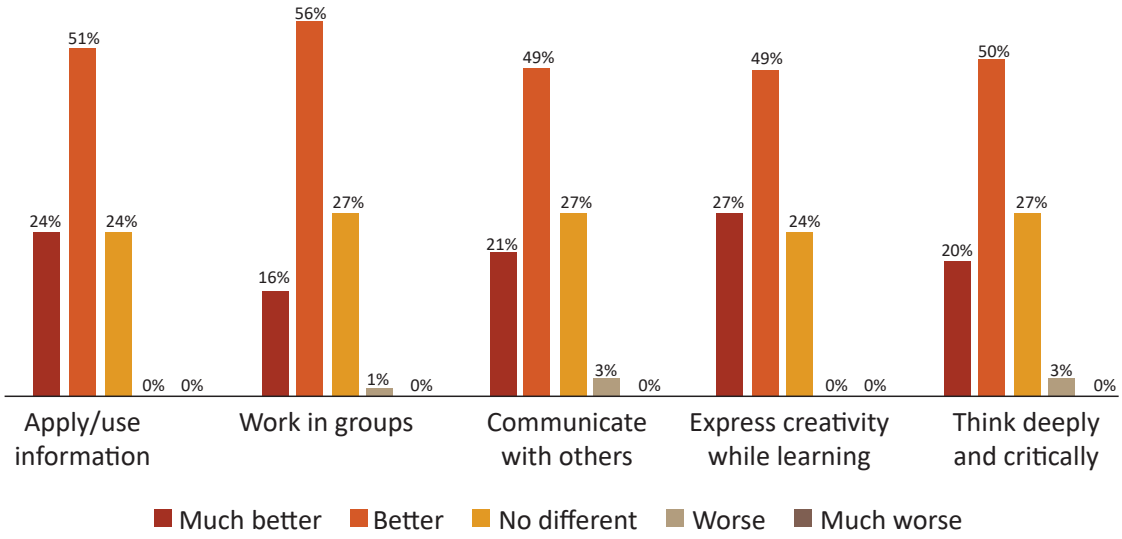

Figure 4. Educator perceptions of the influence of PjBL on student development when compared to other pedagogical approaches.

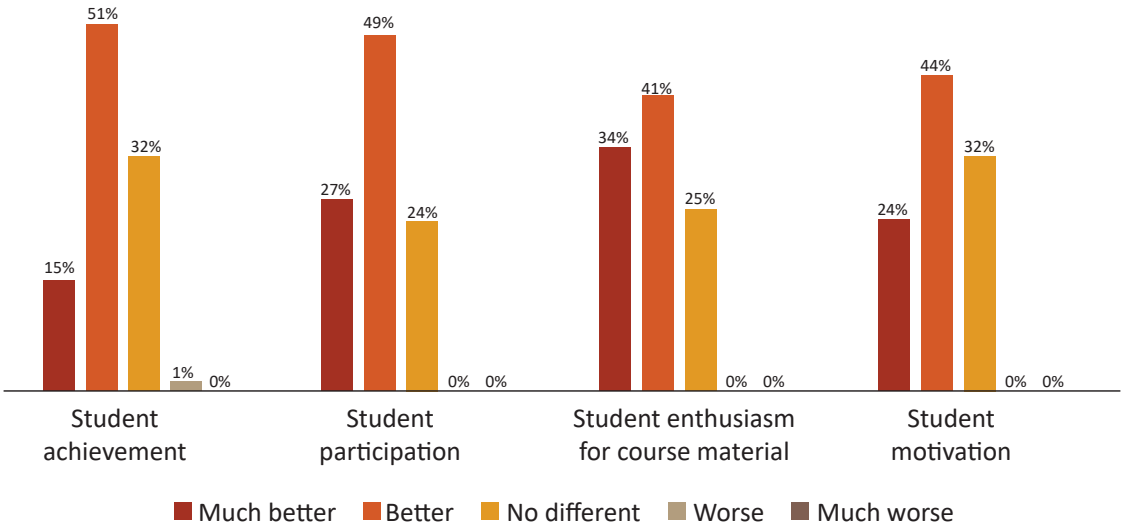

Figure 5. Educator perceptions of the influence of PjBL on student engagement when compared to other pedagogical approaches.

Similarly, most teachers had a positive opinion of PjBL and the majority were in favor of using PjBL in the classroom and/or school-wide implementation. Many teachers agreed to some extent that PjBL made them a more effective teacher and that student achievement, participation, and application of information were better with PjBL than other instructional methods they had tried. Teachers generally reported that participating in PjBL helped their students learn skills and characteristics, such as collaboration and teamwork, critical thinking and problem solving, creativity and innovation, self-direction, and interpersonal skills. Figures 4 and 5 provide a snapshot of educator perceptions of PjBL.

Regarding training, most teachers reported that they were trained by their schools in PjBL and felt prepared to deliver it to their students. The majority of teachers reported that their school had a well-articulated vision for PjBL and that their principals were very supportive of the PjBL approach. Teachers reported that lack of time, competing state priorities, and completing district priorities were the three biggest barriers to effective PjBL implementation.

Discussion

An analysis of academic and behavioral outcomes during 2015–2016, when all schools were implementing, did not reveal consistent significant differences in the performances of PjBL and non-PjBL matched students. This finding differs from the findings of many prior studies of PjBL academic outcomes. In this study PjBL students did, however, perform better on inventories of social-emotional skills that same academic year than students in the normed sample. In addition, perceptions of students and educators of the impact and possibilities of PjBL were quite positive, while some challenges to implementation were identified. Regarding the null finding around academic and behavioral outcomes, it could be that as schools move into deeper and more sophisticated PjBL implementation, differences in these outcomes may become apparent. Or, possibly, it could take more time for strategies such as PjBL to begin to show dividends in student test scores, as has been seen with the New Tech model, while more immediate results are seen for social-emotional measures. It also could be that this state's standardized tests do not measure as well the constructs that are most benefited by PjBL. Furthermore, because of the implementation challenges with the study schools, measurement of academic and behavioral outcomes only took place during one academic year, which does not allow measurement of growth or multiple points of measurement. Measurement over time is needed and during consistent periods of implementation that, ideally, are in the high implementation phase.

Limitations of the Study

Like any evaluation of this kind, this study was not without its limitations. The biggest limitation was that only one year of data collection could be used for academic, behavioral, and social-emotional outcomes measurement, since implementation issues in year two of the study essentially ceased

PjBL implementation at two of the three study schools. The second year of the study, consequently, was used to explore the issues and challenges at the root of what made PjBL implementation so challenging for the schools and difficult to sustain, which proved to be valuable data for schools, districts, and other educators looking to implement PjBL.

Another limitation of the study was that the academic and behavioral outcomes analysis was not a randomized controlled trial (RCT), the gold standard for research studies of model efficacy, as it was impossible to randomly assign students to the PjBL treatment. Thus, the research team used what it thought was the second-best method, a quasi-experimental design that matched treatment and comparison samples in order to ensure baseline equivalence. Even though the design did not utilize the RCT design, the research team calculated baseline equivalence before the study commenced to help ensure apples-to-apples comparisons of students.

Another limitation of this study related to the DESSA, which was used to measure social-emotional outcomes. While the DESSA is a validated instrument and widely used to measure the social-emotional outcomes of interest in this study, it is a teacher inventory, which comes with challenges in terms of subjectivity and interrater reliability. A last notable limitation of this study was that the student and educator surveys used were not validated instruments or administered to a comparison group of students or educators. Thus, only perceptions of the impact of PjBL could be reported.

Suggestions for Future Research

While quality studies exist, there are few studies of PjBL implementation and efficacy when considering the number of students learning in PjBL classrooms and the popularity of project-based learning. Because of this, there is a need for more measurement in order to establish a solid research base and to provide valuable information about implementation. In addition, because the model is so focused on social-emotional and workforce outcomes, researchers need to find more ways to undertake this type of measurement. It is hard and many times expensive to do right, but it is critical given the skills and dispositions required of a 21st-century high school graduate. Future studies need to test ways to measure these types of outcomes and integrate findings into schools in useful ways. Lastly, this study highlights the challenges and difficulties of PjBL implementation and of sustaining PjBL implementation in schools. Future studies need to delve more into the challenges and opportunities of PjBL implementation so that school ripe for PjBL can be properly identified, adequate preparation can be made to ensure a smooth transition to PjBL, potential issues can be anticipated, and pitfalls can be avoided, thus ensuring more successful and sustainable implementation.

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APPENDIX A

Description	Meets Expectations	Approaches Expectations	Does Not Meet Expectations	Observer Notes/Comments
Teachers generally are facilitating, not lecturing				
Multiple student groupings (project teams, small group instruction, etc.) are observed				
PjBL-related materials are evident in classroom (project rubrics, driving questions)				
Classroom environment/arrangement is functionally suited to PjBL				
Students are engaged				

PjBL Classroom Five Point "First Impression" Checklist

Observation Instruments

Performance Task	Rating Guidelines			Observer Rating (check one)	Notes/Comments
	Meets Expectations	Approaches Expectations	Does Not Meet Expectations		
Planning for standards-based PjBL and content instruction	Planning process demonstrates teacher knowledge, understanding, and application of PjBL concepts, research, and best practices. Well-researched teacher plans meet or exceed all six categories of PjBL learning strategies.	Planning process somewhat demonstrates teacher knowledge, understanding, and application of PjBL concepts, research, and best practices. Teacher plans meet some of the six categories of PjBL learning strategies.	Planning process does not demonstrate teacher knowledge, understanding, and application of PjBL concepts, research, and best practices. Teacher plans meet few or none of the six categories of PjBL learning strategies.	☐ Meets Expectations ☐ Approaches Expectations ☐ Does Not Meet Expectations ☐ Unable to Rate	
Authentic i nquiry	Observation and document review indicate that students in this classroom go through an extended process of inquiry in "real-world" activities seeking solutions to complex problems, questions, or challenges. Students exhibit agency in this process.	It is somewhat evident by observation and document review that students in this classroom go through an extended process of inquiry in "real-world" activities seeking solutions to complex problems, questions, or challenges.	It is not evident by observation and document review that students in this classroom go through an extended process of inquiry in "real-world" activities seeking solutions to complex problems, questions, or challenges.	☐ Meets Expectations ☐ Approaches Expectations ☐ Does Not Meet Expectations ☐ Unable to Rate	
Academic rigor of content standards	Document review or teacher comments indicate that projects clearly are derived from specific content area standards that demand rigorous learning.	Document review indicates that projects are somewhat derived from specific content area standards that demand rigorous learning.	Document review indicates that projects are not derived from specific content area standards that demand rigorous learning.	☐ Meets Expectations ☐ Approaches Expectations ☐ Does Not Meet Expectations ☐ Unable to Rate	

Performance Task	Rating Guidelines			Observer Rating (check one)	Notes/Comments
	Meets Expectations	Approaches Expectations	Does Not Meet Expectations		
Applied learning and collaborative problem-solving	Observation indicates that students apply new skills and knowledge toward solution development at a high level. Students work in groups/teams and use higher-order thinking skills and advanced organizational skills. Technology integration, time management, and other "real-world skills" are clearly evident.	Observation indicates that there is some evidence that students apply new skills and knowledge toward solution development at a high level. Students may work in groups/teams, but the use of higher-order thinking skills, advanced organizational skills, technology integration, and other "real-world skills" is not clearly evident.	Observation indicates that there is no evidence that students apply new skills and knowledge toward solution development at a high level. Students may work in groups and/or teams, but there is no evidence of the use of higher-order thinking skills, advanced organizational skills, student self- management, technology integration, and other "real-world skills."	☐ Meets Expectations ☐ Approaches Expectations ☐ Does Not Meet Expectations ☐ Unable to Rate	
Exploring the need to know	Observation shows teacher facilitates students as they conduct independent research, gather information from authentic sources, and collect and record data. Documentation clearly shows that students do field-based or experiential research in "real-world" contexts.	Observation shows there is some evidence that teacher facilitates students as they conduct independent research, gather information from authentic sources, and collect and record data. Documentation may show that students do field-based or experiential research in "real-world" contexts.	Observation does not show teacher facilitates students as they conduct independent research, gather information from authentic sources, and collect and record data. Documentation does not show that students do field-based or experiential research in "real-world" contexts.	☐ Meets Expectations ☐ Approaches Expectations ☐ Does Not Meet Expectations ☐ Unable to Rate	

Performance Task	Rating Guidelines			Observer Rating (check one)	Notes/Comments
	Meets Expectations	Approaches Expectations	Does Not Meet Expectations		
Connecting to an audience	Observation and document review indicate that students in this classroom present their work to others and are provided opportunities to observe and work alongside adults in "real-world" settings relevant to their projects.	Observation and document review show some evidence that students in this classroom present their work to others and are provided opportunities to observe and work alongside adults in "real-world" settings relevant to their projects.	Observation and document review do not indicate that students in this classroom present their work to others or are provided opportunities to observe and work alongside adults in "real-world" settings relevant to their projects.	☐ Meets Expectations ☐ Approaches Expectations ☐ Does Not Meet Expectations ☐ Unable to Rate	
Authentic assessment that includes reflection and revision	Observation and document review indicate clear evidence that: teachers engage in ongoing formative and/or summative assessment of students; students are assessed in authentic manners such as portfolios and presentations; and, in exceptional cases, students establish assessment criteria and their own assessment opportunities.	Observation and document review indicate some evidence that: teachers engage in ongoing formative and/or summative assessment of students; students are assessed in authentic manners such as portfolios and presentations; and students establish assessment criteria and their own assessment opportunities.	Observation and document review indicate no evidence that: teachers engage in ongoing formative and/or summative assessment of students; students are assessed in authentic manners such as portfolios and presentations; and students establish assessment criteria and their own assessment opportunities.	☐ Meets Expectations ☐ Approaches Expectations ☐ Does Not Meet Expectations ☐ Unable to Rate	

APPENDIX B

Deveraux Student Strengths Assessment Technical Information

The DESSA is a 72-item, standardized, norm-referenced behavior rating scale that assesses the social-emotional competencies that serve as protective factors for children in kindergarten through the eighth grade. The DESSA can be completed by parents/guardians, teachers, or staff at schools and child-serving agencies, including after-school, social service, and mental health programs. The assessment is entirely strength-based, meaning that the items query positive behaviors (e.g., get along with others) rather than maladaptive ones (e.g., annoy others). The DESSA is organized into conceptually derived scales that provide information about eight key social-emotional competencies. Standard scores can be used to calibrate each child's competence in each of the eight dimensions and guide school/program-wide, class-wide, and individual strategies to promote those competencies. For each item, the rater is asked to indicate on a five-point scale how often the student engaged in each behavior over the past four weeks.

The DESSA was developed to meet or exceed professional standards for a high-quality, well-developed assessment instrument. The standardization sample; internal, interrater, and test-retest reliabilities; and content, construct, and criterion validity evidence are discussed at length in the DESSA manual.

The DESSA standardization sample consists of 2,500 children who are representative of the

U.S. population with respect to gender, race (see Table B-1), Hispanic ethnicity, region of residence, and poverty status.

As shown in Table B-2, the internal consistency (alpha coefficients) of each scale as well

as the Social-Emotional Composite, for both teacher/staff and parent raters, exceeds the

recommended standard of .80 for a scale and .90 for a total scale (i.e., the Social-Emotional

Composite) recommended by Bracken (1987). In fact, the alpha coefficient for the Social-

Emotional Composite is .98 for parents and .99 for teachers/staff.

	American Indian/ Alaska Native		Asian		Black/ African American		Native/ Hawaiian/ Pacific Islander		White		Total
	n	%	n	%	n	%	n	%	n	%	
Northeast	9	1.7	7	1.3	190	35.6	0	0	327	61.4	533
South	16	1.8	22	2.5	200	22.3	3	0.3	424	47.3	665
Midwest	3	0.6	12	2.2	71	13.0	2	0.4	453	83.1	541
West	13	2.6	24	4.7	20	3.9	9	1.8	354	69.8	420
Total	41	1.9	65	3.0	481	22.3	14	0.6	1,558	72.2	2,159
U.S. %[1]		1.2		4.0		15.4		0.2		76.3	

Note: The U.S. race data are based on the 2006 figures for 5- through 14-year-olds only in "Resident Population by Race, Hispanic Origin, and Age: 2000 and 2006. Table No. 8." Statistical Abstract of the United States: 2008 (127th edition): U.S. Census Bureau, 2008.

[1]U.S. figures do not add up to 100% due to "Two or more Races" not being included.

Table B-1. Standardization sample characteristics by race and geographic region.

Scales	Raters	
	Parents	Teachers/Staff
Social-Emotional Composite	.98	.99
Personal Responsibility	.86	.92
Optimistic Thinking	.82	.89
Goal-Directed Behavior	.88	.93
Social-Awareness	.84	.91
Decision Making	.85	.92
Relationship Skills	.89	.94
Self-Awareness	.82	.89
Self-Management	.86	.92

Test-retest reliabilities are also high with correlation coefficients ranging from .79 to .90 for parents and from .86 to .94 for teachers/staff. Interrater reliabilities are also quite good, with median scale correlation coefficients of .725 for parents and .735 for teachers/staff.

Table B-2. Internal reliability (alpha) coefficients for the DESSA scales by rater.

APPENDIX C

Student Survey Instrument

Q1. What grade are you in? DROPDOWN

a. 3rd

b. 4th

c. 5th

d. 6th

e. 7th

f. 8th

g. 9th

h. 10th

Q2. Project-based learning is when you learn by working in class/group projects and investigating challenging questions, instead of learning by yourself through lectures.

How many years have you been taught through **Project-Based Learning?**

i. This is my first year

j. 2 years

k. 3 or more years

l. I don't know

Q3. DISPLAY IF Q3 = 5TH AND BELOW: This year in school, my teacher used **Project-Based Learning. . .**

a. A lot of the time

b. Some of the time

c. Hardly ever

d. Never

e. I don't know

Q4. DISPLAY IF Q3 = 6TH AND ABOVE: Complete the following sentence(s)

This year at school. . .

	A lot of the time	Some of the time	Hardly ever	Never	Does not apply
. . . my **English/Language Arts** teacher(s) used Project-Based Learning . . .					
. . . my **Science** teacher(s) used Project-Based Learning . . .					
. . . my **Social Studies** (e.g., World History, Geography, etc.) teacher(s) used Project-Based Learning . . .					
. . . my **Math** teacher(s) used Project-Based Learning . . .					
. . . my **Foreign Language** teacher(s) used Project-Based Learning . . .					

Q5. Complete the following sentence(s).

This year at school, I generally enjoyed **Project-Based Learning. . .**

	A lot	Some	A little	Not at all
. . . in my **English/Language Arts** class . . . (DISPLAY IF Q6 ELA EQUALS "A LOT OF THE TIME" OR "SOME OF THE TIME")				
. . . my **Science** class . . . (DISPLAY IF Q6 SCIENCE EQUALS "A LOT OF THE TIME" OR "SOME OF THE TIME")				
. . . my **Social Studies** (e.g., World History, Geography, etc.) class . . . (DISPLAY IF Q6 SOCIAL STUDIES EQUALS "A LOT OF THE TIME" OR "SOME OF THE TIME")				
. . . my **Math** class . . . (DISPLAY IF Q6 MATH EQUALS "A LOT OF THE TIME" OR "SOME OF THE TIME")				
. . . my **Foreign Language** class . . . (DISPLAY IF Q6 FOREIGN LANGUAGE EQUALS "A LOT OF THE TIME" OR "SOME OF THE TIME")				

Q6. Compared to when you don't participate in Project-Based Learning, how much do you learn when you do participate in **Project-Based Learning in your. . .**

	I learn more	I learn about the same	I do not learn as much	I don't know
. . . **English/Language Arts** class? (DISPLAY IF Q6 ELA EQUALS "A LOT OF THE TIME" OR "SOME OF THE TIME")				
. . . **Science** class? (DISPLAY IF Q6 SCIENCE EQUALS "A LOT OF THE TIME" OR "SOME OF THE TIME")				
. . . **Social Studies** (e.g., World History, Geography, etc.) class? (DISPLAY IF Q6 SOCIAL STUDIES EQUALS "A LOT OF THE TIME" OR "SOME OF THE TIME")				
. . . **Math** class? (DISPLAY IF Q6 MATH EQUALS "A LOT OF THE TIME" OR "SOME OF THE TIME")				
. . . **Foreign Language** class? (DISPLAY IF Q6 FOREIGN LANGUAGE EQUALS "A LOT OF THE TIME" OR "SOME OF THE TIME")				

Q7. Participating in **Project-Based Learning** in my school **generally** has helped me. . .

	Agree	Disagree	I don't know
. . . learn more in school.			
. . . better understand how to show what I have learned in school			
. . . feel excited about learning.			
. . . feel like I have a say in my learning.			

Q8. What have you liked most about **Project-Based Learning?**

Q9. What have you liked the least about **Project-Based Learning?**

In school, how often do you. . .

	A lot	Some	Hardly ever	Never	I don't know.
. . . work with other students in groups or teams?					
. . . help create rubrics for your projects?					
. . . use portfolios to show how much you have learned?					
. . . make presentations to the class?					
. . . make presentations to people outside of your school?					
. . . help design projects used in class?					

Please tell us how often you do the following.

	Most of the time	Some of the time	Hardly ever	Never
I work well with people I disagree with or do not like.				
I am able to give helpful feedback to others on their work.				
I feel comfortable presenting my work in front of other people.				
I respect people who have different ideas than I do.				
I am able to work through disagreements with others in a peaceful way.				

Please tell us how often you do the following.

	Most of the time	Some of the time	Hardly ever	Never
I think about the problems my teacher gives me a lot of different ways.				
I am willing to try out new ideas.				
I ask questions to get the information I need to solve problems.				
I back up my opinions with evidence and examples.				
I am able to manage my time.				
I set goals for myself.				

Q10. I am. . .

a. Male

b. Female

Q11. I would describe myself as. . . (Choose all that apply)

c. Black or African American

d. White

e. Spanish/Hispanic/Latino

f. Asian or Pacific Islander

g. American Indian or Alaska Native

h. Other: _____

APPENDIX D

Teacher Survey Instrument

Qi. What is the name of your school?

Qii. Please indicate which of the following subjects you teach at SCHOOL NAME. (Check all that apply)

- ❑ Math
- ❑ ELA
- ❑ Science
- ❑ Social Studies
- ❑ Art/Music
- ❑ P.E.
- ❑ Foreign Language
- ❑ Computer/Technology
- ❑ Other _____

Qiii. Please indicate which of the following grades you teach at SCHOOL NAME. (Check all that apply)

- ❑ Pre-K
- ❑ Kindergarten
- ❑ 1st Grade
- ❑ 2nd Grade
- ❑ 3rd Grade
- ❑ 4th Grade
- ❑ 5th Grade

Q1. How many years have you been a teacher at SCHOOL NAME, including this school year?

a. This is my first year
b. 2–4
c. 5–7
d. 8–10
e. 11 or more

Q2. How many years have you been teaching, in total, including this school year?

a. This is my first year
b. 2–4
c. 5–7
d. 8–10
e. 11 or more

Q3. To what extent are you satisfied with your current job?

a. Very satisfied
b. Satisfied
c. Dissatisfied
d. Very dissatisfied

Q4. Do you currently implement PjBL in any of your classes at SCHOOL NAME?

a. Yes
b. No

Q5. In your teaching this year, how often did you ask students to do the following?

	Frequently	Occasionally	Rarely	Never
Assist with design of assessment rubrics for use in class				
Self-evaluate the quality of their work before it is completed				
Use peer, teacher, or expert feedback to revise their own work				
Model different strategies for confronting a problem or question				

Q6. In your teaching this year, how often did you ask students to do the following?

	Almost daily	About 1–3 times per week	About 1–3 times per month	A few times a semester	Almost never
Work in small groups or teams					
Present group work to the class, teacher, or others					
Create an original product or performance to express their ideas					
Engage in deep research or inquiry about a topic(s)					
Choose their own topics of learning or questions to pursue					

Q7. To what extent do you agree with these statements about the critical thinking and problem-solving skills of your students this year?

	Completely agree	Somewhat agree	Somewhat disagree	Completely disagree	I'm not sure
Students have learned critical thinking and problem-solving skills while in my class.					
I have been able to effectively assess students' critical thinking and problem-solving skills.					
PjBL helps my students develop critical thinking and problem-solving skills (DISPLAY ONLY IF Q4 = YES).					

Q8. To what extent do you agree with these statements about the collaboration and teamwork skills of your students this year?

	Completely agree	Somewhat agree	Somewhat disagree	Completely disagree	I'm not sure
Students have learned collaboration and teamwork skills while in my class.					
I have been able to effectively assess students' collaboration and teamwork skills.					
PjBL helps my students develop collaboration and teamwork skills (DISPLAY ONLY IF Q4 = YES).					

Q9. To what extent do you agree with these statements about the interpersonal skills of your students this year?

	Completely agree	Somewhat agree	Somewhat disagree	Completely disagree	I'm not sure
Students have learned interpersonal skills while in my class.					
I have been able to effectively assess students' interpersonal skills.					
PjBL helps my students develop interpersonal skills (DISPLAY ONLY IF Q4 = YES).					

Q10. To what extent do you agree with these statements about the creativity and innovation skills of your students this year?

	Completely agree	Somewhat agree	Somewhat disagree	Completely disagree	I'm not sure
Students have learned skills in creativity and innovation while in my class.					
I have been able to effectively assess students' skills in creativity and innovation.					
PjBL helps my students develop skills in creativity and innovation (DISPLAY ONLY IF Q4 = YES).					

Q11. To what extent do you agree with these statements about the self-direction skills of your students this year?

	Completely agree	Somewhat agree	Somewhat disagree	Completely disagree	I'm not sure
Students have learned self-direction skills while in my class.					
I have been able to effectively assess students' self-direction skills.					
PjBL helps my students develop self-direction skills (DISPLAY ONLY IF Q4 = YES).					

Q12. Including this year, how many years have you been implementing PjBL in total (at this school and other schools)?

a. 1–3
b. 4–6
c. 7–9
d. 10 or more

Q13. Including this year, how many years have you been implementing PjBL in your classes at SCHOOL NAME?

e. 1–3
f. 4–6
g. 7–9
h. 10 or more

Q14. Do you have an endorsement in PjBL?

a. Yes
b. No
c. I am in the process of being endorsed

Q15. Does SCHOOL NAME have a clear and well-articulated vision for PjBL?

a. Yes
b. No

Q16. Are PjBL teachers at SCHOOL NAME provided training in PjBL?

a. Yes
b. No

Q17. IF Q15 = YES: Which of the following are ways that PjBL teachers at SCHOOL NAME are trained? (Check all that apply)

- ☐ Team-wide planning for PjBL
- ☐ District-wide staff development days (PjBL focused)
- ☐ Common planning periods for PjBL teachers
- ☐ State and/or regional PjBL conferences
- ☐ National PjBL conferences
- ☐ PjBL webinars
- ☐ Online sharing/collaborative environments related to PjBL
- ☐ Other (please specify): _____

Q18. How prepared do you feel to implement PjBL in the classroom?

a. Very well prepared
b. Prepared
c. Somewhat prepared
d. Not at all prepared

Q19. About how many PjBL-focused workshops, conferences, or training sessions have you participated in during the last 12 months?

a. None
b. 0
c. 1
d. 2
e. 3
f. 4 or more

Q20. Are there topics not covered in your school's PjBL training that you feel should be covered in order for you to be able to effectively implement PjBL in the classroom?

a. Yes
b. No

Q21. IF Q20 = YES: What topics do you feel should be covered?

Q22. How would you describe your level of involvement in PjBL?

I have . . .

a. completely integrated PjBL into my classroom
b. somewhat integrated PjBL into my classroom
c. not tried it in my classroom

Q23. How supportive is your school administration of the PjBL approach?

a. Very supportive
b. Supportive
c. Somewhat supportive
d. Not at all supportive

Q24. To what extent . . .

	Completely in favor	Somewhat in favor	Neutral	Somewhat oppose	Completely oppose
. . . are you in favor of using PjBL in your classroom?					
. . . are you in favor of a school-wide implementation of PjBL?					

Q25. To what extent do you think PjBL has permeated your school's culture?

a. Completely
b. To a large extent, but not completely
c. To some extent
d. Not very much at all
e. Not at all

Q26. Please answer the following.

How often do you . . .

	Frequently	Occasionally	Rarely	Never
. . . use rubrics to set expectations for projects?				
. . . require portfolios as part of the PjBL assessment process?				
... require that students make presentations to the class?				
. . . require that students make presentations to business and/or community partners?				
. . . use a driving question to frame PjBL class projects?				
. . . work in teams with other teachers?				
. . . involve community partners in project development?				
. . . intentionally align standards with projects?				

Q27. How much resistance to your implementation of PjBL do you generally encounter?

a. A lot of resistance
b. Some resistance
c. A little resistance
d. No resistance

Q28. From which areas have you received resistance? (Check all that apply)

- ❑ district/central office
- ❑ building leadership/administration
- ❑ grade/content area team
- ❑ other teachers
- ❑ parents
- ❑ students
- ❑ Other, please specify: _____

Q29. Please indicate the extent to which each of the following presents a barrier to effectively implementing project-based learning:

	A major barrier	A moderate barrier	Somewhat of a barrier	Not at all a barrier
Lack of time				
Curriculum alignment/pacing				
Difficulty assessing students				
Lack of training/professional development				
Classroom management challenges				
Competing district priorities				
Competing state priorities				
State regulations/mandates				

Q30. Please list up to 3 other factors that negatively impact your ability to effectively implement project-based learning.

Q31. Compared to other models you have tried in the past, overall, how effective of a pedagogical approach is PjBL?

Overall, PjBL is _____ than other instructional models I have used in the past.

a. much better
b. better
c. no different
d. worse
e. much worse
f. I only have taught using PjBL ***SKIP TO Q35***

Q32. Compared to other models you have tried in the past, how effective is PjBL in positively impacting . . .

	Much Better	Better	No Different	Worse	Much Worse
. . . student achievement?					
. . . student participation in class?					
. . . student enthusiasm for course material?					
. . . student motivation?					

Q33. Compared to other models you have tried in the past, how effective is PjBL in positively impacting students' ability to . . .

	Much Better	Better	No Different	Worse	Much Worse
. . . apply/use information they have learned?					
. . . work effectively in groups?					
. . . communicate with others?					
. . . express creativity while learning?					
. . . think deeply and critically about subject matter?					

Q34. Compared to other models you have tried in the past, how effective is PBL in positively impacting students' interest in . . .

	Much Better	Better	No Different	Worse	Much Worse	N/A
. . . post–high school education (college, tech school, community college)?						
. . . exploring different career paths?						
. . . attaining college credit (dual credit) while in high school?						

Q35. Compared to a traditional instructional model, how much work is it for you to implement PjBL?

PjBL requires . . .

a. much more work
b. somewhat more work
c. about the same amount of work
d. somewhat less work
e. much less work

Q36. Overall, to what extent do you agree that using PjBL has helped you become a more effective teacher?

a. Strongly agree
b. Somewhat agree
c. Somewhat disagree
d. Strongly disagree

Q37. Use the space below to comment on any aspects of PjBL that we have not covered or to provide any general impressions that would be helpful for us to know.

Q38. What is your gender?

a. Female
b. Male
c. Prefer not to say

Q39. What is your race/ethnicity?

a. Black
b. Asian American
c. White
d. Hispanic American
e. Native American
f. Prefer not to say
g. Other (please specify): _____