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Narrowing the Achievement Gap in Second-Grade Social Studies and Content Area Literacy: The Promise of a Project-Based Approach

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The authors wish to acknowledge the teachers who provided feedback on and implemented the curricula, our colleagues who performed expert review of the assessments, and the MSU students who administered the assessments.

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Abstract

This design experiment addresses the question: How can second-grade students from low-SES schools attain the same levels of achievement as students from high-SES schools on standards-based social studies and content area literacy assessments? Students from two high-SES school districts were assessed in order to establish target levels of achievement. Two project-based units focused on state standards in economics; civics and government; public discourse, decision making, and citizen involvement; and content area literacy were developed and implemented successively in four classrooms in low-SES school districts. Achievement of students in the low-SES districts was then compared to that of students in high-SES districts. Results show no statistically significant differences: following instruction, there was no SES achievement gap on these standards-based assessments. We describe the unit plans and strategies that the teachers used to implement these plans, and we discuss implications of the study for future research and practice.

Keywords: elementary social studies, content area literacy, curricular integration, project-based learning, achievement gap, design experiment

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Literacy: The Promise of a Project-Based Approach

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Narrowing the Achievement Gap in Second-Grade Social Studies and Content Area Literacy: The Promise of a Project-Based Approach

Early schooling presents an opportune time to lay a strong foundation for social studies and content literacy (that is, reading and writing to learn content). Yet, both social studies and content literacy are often neglected in the primary grades (Duke, 2000; Fitchett & Heafner, 2010; Jeong, Gaffney, & Choi, 2010; Pace, 2011; McGuire, 2007; VanFossen, 2005; Vogler et. al, 2007). Without sufficient classroom time devoted to teaching foundational knowledge and skills in social studies early on, students are at risk of not developing the characteristics necessary for full and effective participation in a democratic society (National Council for Social Studies [NCSS], 1989, 2008, 2010). Similarly, without foundational content area literacy skills, particularly the opportunity to engage with informational texts, students are likely to struggle in fourth grade and beyond, when the ability to learn from content area text is traditionally expected (Chall, 1983). Neglect of both social studies and content area literacy is problematic for individual students' development and for the civic health of the country.

As is often the case, children of low-SES are the greatest victims of the shortcomings of our educational system. Children of low-SES are even less likely to be provided with opportunities to develop content area literacy (Duke, 2000; Wright, 2011) and social studies knowledge (Camburn & Han, 2011; Jennings & Rentner, 2006) in the primary grades. By the time national tests are administered, students of low-SES are substantially less likely to meet expectations for performance in social studies (in history and civics, specifically) (National Center for Education Statistics, 2011a; National Center for Education Statistics, 2011b) and reading and writing (National Center for Education Statistics, 2009; Perie, Grigg, & Donahue, 2005). This study investigates what is needed to narrow the achievement gap between low- and

high-SES students in the areas of social studies and content area literacy. Specifically, we address the question: How can second-grade students from low-SES schools attain the same levels of achievement as students from high-SES schools on standards-based social studies and content area literacy assessments? For reasons explained in the following sections, we identified an integrated, project-based approach to teaching social studies and content literacy to be particularly promising.

Literature Review

Considerable research suggests that the integration of science and literacy is beneficial to both science and literacy learning (e.g., Anderson, West, Beck, MacDonnell, & Frisbie, 1997; Goldschmidt, 2009; Guthrie, McRae, & Klauda, 2007; Romance & Vitale, 2001; Vitale & Romance, 2011; Wang & Herman, 2005). For example, the addition of related books to a hands-on science curriculum was shown to result in greater science, as well as literacy, learning than the hands-on experiences alone (Wang & Herman, 2005). Thus we began with the premise that an integrated approach to developing social studies and content area literacy was advisable.

While there are many ways to integrate content area and content literacy instruction, we join other scholars in viewing project-based approaches as particularly powerful (e.g., Blumenfeld et al., 1991; Katz & Chard, 2000; Railsback, 2002). In the following sections, we describe the history, nature, and research support for this approach to teaching and learning.

A Brief History of Project-based Approaches

Project-based approaches were introduced during the Progressive era by scholars such as John Dewey and William Heard Kilpatrick. The scholars suggested instructing children based on their interests and natural curiosity and by learning by doing, rather than relying on the dry, rote, learning of traditional approaches, as long as the approach was purposeful (Beineke, 1998;

Dewey, 1902; Kilpatrick, 1918; Kliebard, 1986). Historically, teachers using this approach selected projects based upon children's perceived interests and included class activities such as presenting a play, producing a newspaper, or learning about an animal living near their school. These kinds of projects often joined the practical with the theoretical, emphasizing real world application of content learning in the disciplines. Although some defenders of traditional education have argued that project-based approaches were often devoid of much academic rigor, there was (and is) wide variation in how teachers implemented the approach, with some more intellectually demanding than others (Kliebard, 1986).

Defining Project-Based Approaches

There is great variety in researchers' beliefs about what project-based approaches consist of or how they should be implemented. For example, whereas both Krajcik and colleagues (1998) and Barron and colleagues (1998) agree that meaningful questions anchored in a real-world problem relying on collaboration and student participation are key qualities of project-based approaches, they list different additional elements they believe to be essential to this work, such as the use of technological tools (Krajcik et al., 1998) or ample opportunity for formative self-assessment and revision (Barron et al., 1998). In sifting through the varied literature on project-based approaches to learning, Thomas (2000) determined five key qualities consistent throughout much of the literature. Specifically, he concluded that project-based approaches (a) are central to the curriculum; (b) focus on questions or problems that drive learning; (c) involve the construction and transformation of students' knowledge; (d) are at least somewhat student-driven; and (e) take the form of authentic or real-world projects.

Examining the literature on project-based approaches with young children in particular, we noticed that project-based approaches typically integrate several subject areas or domains into

an investigation of a real-world theme, problem, or question (Katz & Chard, 2000). Students learn by addressing an authentic problem, question, or issue over an extended period of time, often producing a final project that has application beyond school. Often, although not always, topics for study in project-based approaches are initiated by an individual child or group of children (Katz & Chard, 2000). In this way, project-based approaches involve exploration (often in the form of data collection) of a topic, structured by the teacher in the form of learning centers, art projects, scientific investigations, surveys, visits from local experts, and field trips. These projects can stem directly from students' questions such as in the case of a project addressing the question, "Why are our shoes made on the other side of the world?" (Levy, 1996) or can build from carefully crafted and real-world questions the teacher feels might relate to students, such as how to reduce the volume of trash at one's school. In either case, students explore authentic questions across various disciplines such as economics, mathematics and statistics, or geography, while building their language and literacy.

One important subtype of project-based approaches is known as problem-based learning (PBL). PBL was originally developed as a way of instructing medical students by having them solve a diagnostic problem (i.e., diagnose a patient with a list of symptoms). Then, educators in higher education (such as law, graduate education, and business) and eventually educators at the secondary and elementary levels adopted the approach (Thomas, 2000). PBL is typically defined as learning organized around investigating, explaining, and resolving meaningful problems that relate to students' lives (Barrows, 2000; Hmelo-Silver, 2004; Torp & Sage, 2002). While PBL may not involve a culminating event to the same degree as other project-based approaches, and students may not play a role in actually implementing the resolution of the problem in the real world, these approaches do fall under project-based approaches as defined earlier and are

included in the research reviewed in the following section.

A Brief Review of the Research on Project-based Approaches

Research on the impact of project-based approaches on both achievement and affective dimensions such as attitude, engagement, and motivation is quite positive overall (Thomas, 2000). Benefits have been noted for many groups of students, including students with learning disabilities or other learning difficulties. In one study, conducted by Okolo and Ferretti (1996), 21 students with learning disabilities participated in project-based curricula intended to help students learn events of the American Revolution. Although the researchers hypothesized that students would learn little about the war given their learning struggles, students far exceeded the researchers' expectations. Okolo and Ferretti (1996) developed two instruments for their study. One was intended to measure motivation of students' learning about the Revolutionary War and the other was used to measure students' content knowledge of the war. The authors noted that students significantly improved their knowledge of the American Revolution and reported higher motivation for learning the content. Okolo and Ferretti concluded that their project-based approach provided an effective and motivating method through which students can acquire pertinent social studies content.

In another study, Filippatou and Kaldi (2010) studied 24 fourth-grade students with learning disabilities. The students participated in project-based curricula to acquire knowledge of sea animals. They made significant gains in their knowledge of the content overall. This study was part of a larger study of fourth and fifth grade students in which Kaldi and colleagues (2011) examined students' content knowledge and self-efficacy as a result of a project-based approach. This larger group of students also increased their content knowledge of sea animals as measured by an open-ended and multiple choice assessment. In addition, the researchers administered an

attitude survey and found improved levels of self-efficacy and motivation among the students who participated in project-based approach to learning (Kaldi et al., 2011).

Studies of project-based approaches have varied in the degree to which the projects are aligned with specific learning standards. Rivet and Krajcik (2004) implemented a project-based science curriculum closely aligned with district, state, and national science standards to middle school students in an urban district for a period of four years. Each of the four years, additional teachers and students were added to the study. Students who received project-based instruction showed significant academic gains in science content knowledge as determined by pre- and post-test results.

As in some of the aforementioned studies, students and teachers participating in project-based instruction gain not only content knowledge, but also experience affective benefits: students develop more positive attitudes toward learning and teachers develop greater feelings of professionalism. For example, Tretten and Zachariou (1995) used teacher questionnaires and interviews to find that teachers in four elementary schools implementing project-based instruction believed the instruction had positive effects on students' affect such as their attitudes toward learning and their self-esteem. In their study of eighth grade students studying the Westward expansion, Hernandez-Ramos and De La Paz (2009) combined measures of learning with affective measures. The intervention group participated in a project-based approach, creating documentaries, while the comparison group participated in more traditional methods of instruction in the same content. Both groups were administered pre-/post-tests of content knowledge and pre-/post-assessments of their attitude and engagement. The intervention group not only demonstrated higher content knowledge but also reported much higher engagement in learning history than students in the comparison group. The researchers also noted that the

students in the intervention group were better able to apply historical reasoning and acquired knowledge beyond merely learning basic historical facts (Hernandez-Ramos & De La Paz, 2009).

In a study of two first-grade classrooms in a school with over 90% low-income students, Hertzog (2007) found evidence of student achievement and improved engagement. Hertzog noted the complexities of implementing the project-based approach in this setting but also emphasized the potential benefits. Teachers reported that they were unsure whether their students were acquiring greater science content knowledge as a result of the project but reported that the students seemed more engaged and more motivated to learn the content than students in previous years (who were not taught using project-based approaches).

There is also some evidence that higher-order cognitive processes, such as planning, communicating, and problem solving, are significantly enhanced by project-based as compared to more traditional approaches. The majority of studies designed to examine the impact of project-based approaches on these higher-order processes focus on older students. For example, Boaler (1998) found in a three-year experimental study of two British high schools that, compared to traditional mathematics education, project-based classrooms had greater gains in both basic level math skills and higher order conceptual questions on a national standardized examination. Furthermore, students in project-based classrooms exhibited greater enjoyment of the mathematics curriculum, an impressive feat given that many high school students struggle with and have low self-efficacy related to mathematics. Similarly, Shepherd (1998) found that high school students made significant gains in their critical thinking (as measured by a standardized exam) following a nine-week unit attempting to solve a housing shortage problem in various countries (as reported in Thomas, 2000). Although this unit was problem-based (recall

that this is a specific subtype of project-based approaches), it seems likely that the gains made in critical thinking would have remained or perhaps even been enhanced with the addition of an authentic project in which students might have communicated their potential solutions to organizations that might act upon them or in some other way actually attempted to address the housing shortage. These studies further suggest the promise of project-based approaches, but they also illustrate a limitation of research on project-based approaches: studies tend to focus on older students and not on primary-grade students as in the present investigation.

Despite the relatively small number of studies on the impact of project-based approaches with young children, based on research with older students it seems plausible and likely that well-crafted project-based approaches will lead to improved student learning. Further, some individual characteristics of project-based approaches are associated with improved learning in young children. Research with second- and third-grade students in the context of science instruction found that opportunities to engage in authentic literacy experiences (i.e., reading and writing genres similar to those used outside of a schooling context for purposes beyond just learning to read and write) were associated with greater comprehension and writing gains than more traditional activities common only to school settings (Purcell-Gates, Duke, & Martineau, 2007). Approaches in reading that ask young children to connect their prior knowledge and experiences to texts they read and create benefits both their comprehension (e.g., Brown, Pressley, Van Meter, & Schuder, 1996; Saunders & Goldenberg, 1999; Tharp, 1982) and their writing (Dyson, 2003). Making social studies relevant to students' everyday lives and grounded in their prior knowledge and experiences appears to lead to deeper social studies learning and engagement (e.g., Alleman & Brophy, 1998; Bennett, 2007). For these reasons, we hypothesize that project-based approaches can positively influence children's social studies and literacy

learning.

Potential Drawbacks of a Project-Based Approach

Project-based approaches are not without challenges. Research makes clear the need for considerable scaffolding and support of teachers and students in project-based teaching (Thomas, 2000). This support can take many shapes, such as promoting continual self-reflection about the relationship between the project activities and its goals (e.g., Barron et al., 1998). Related to this, in the current standards-based climate, many may wonder whether project-based approaches can fit into an already packed curriculum and can successfully address national, state, and district standards. Others might wonder whether it is possible to curricularize (i.e., instantiate in formal unit and lesson plans) for widespread use an approach to learning that is, by definition, somewhat dependent upon the specific students, classroom, and community in which the learning takes place (because projects stem from or are informed by students' questions and experiences and often relate to community-specific problems). These are challenges we have attempted to address in the present study: providing considerable support for teachers to implement a project-based approach, aligning project-based units to specific learning standards, and curricularizing project-based learning such that, if successful, projects could be implemented by many teachers across many settings.

Method

Design

To address the research question—How can second-grade students from low-SES schools attain the same levels of achievement as students from high-SES schools on standards-based social studies and content area literacy assessments—this study employed a design or formative experiment approach (Bradley & Reinking, 2011; Cobb, Confrey, diSessa, Lehrer, & Schauble,

2003). We set a pedagogical goal: for students who are in low-SES settings to perform at the same level as students in high-SES school settings on standards-based assessments in social studies and content literacy. We engaged in an iterative process of research and development aimed at achieving the pedagogical goal.

Following review of literature and use of focus groups, we developed detailed unit and lesson plans for two projects (between 50 and 75 single-spaced pages each), grounded in characteristics of project-based pedagogy. One project targeted the Michigan Grade Level Content Expectations (GLCEs) in economics; public discourse, decision making, and citizen involvement (Michigan Department of Education, 2006); and content area literacy (Michigan Department of Education, 2007) (hereafter the economics project). The other project targeted civics; public discourse, decision making, and citizen involvement (Michigan Department of Education, 2006), and content area literacy (Michigan Department of Education, 2007) (hereafter the civics project). The economics and civics projects were comprised of 21 and 20 lessons respectively, with each lesson lasting approximately 45 minutes. See Appendix C for a brief description of each project.

Consistent with design-based research, we engaged in iterative qualitative and quantitative data collection and analysis before, during, and after each of three successive implementations of the two projects. At each implementation we provided detailed lesson and unit plans, as well as materials needed, and opportunities to consult regularly with project personnel regarding project implementation. We revised each project in between each implementation based on the data collected. Table 1 provides an overview of the data collection and implementation schedule.

Participants

Participants in the project were six teachers—two from very high-SES school settings and four from very low-SES school settings—and a subset of their students. The teachers in the high-SES school settings (used to establish our benchmark or pedagogical goal) came from two different schools in two different school districts, each school having 2% or less students on free or reduced price lunch and school achievement above the state average on state exams in social studies, reading, and writing. The teachers in the low-SES school settings (used to iteratively research and develop the integrated, project-based units) were from three schools in three school districts, each school having 83% to 92% of students on free and reduced price lunch, and school achievement below the state average on state exams in social studies, reading, and writing.

Given the time- and labor-intensive nature of the assessments to be administered in the study, we assessed only a subset of 10 – 12 students in each class selected at random from among all students whose parents/guardians have provided consent, for a total of 43 children in low-SES classrooms and 20 children in high-SES classrooms.

Measures

Our measures for student achievement included individually administered interviews in (1) civics; (2) economics and public discourse, decision making, and citizen involvement; (3) reading. Each interview lasted about 20 minutes and was administered by a trained researcher who wrote and audio recorded students' responses. The fourth assessment was a whole-class administered assessment in writing. We administered each assessment immediately before and after the implementation of the two projects.

Each of these assessments assessed second-grade GLCEs (Michigan Department of Education, 2006, 2007) and was designed by the authors. We also designed assessment rubrics to evaluate student responses on a continuum of 1 to 4, with 1 indicating “does not meet state

content expectations” and 4 indicating “meets state content expectations.” We scored student responses blind to condition and time of assessment (i.e., pre vs. post), established inter-rater reliability, and then scored all remaining assessments. Specifics regarding each assessment are provided in the following sections.

Civics and government. This assessment measured student achievement of nine civics and government GLCEs (see Appendix A). Two members of the research team designed the assessment and revised it based upon other team members’ input. The assessment had 16 questions, measuring a total of nine GLCEs, for a possible score of 36 (as each question was scored on a scale of 1 to 4). Examples of questions are: “Why do you think we have a government?” and “What are some things the government pays for or takes care of for us?”

Due to the complex nature of these content expectations (as well as the fact that no assessments for these GLCEs exist), two reviewers with expertise in the social studies GLCEs provided feedback on the assessment and a draft of the assessment rubric. Research team members established an inter-rater reliability (90%) for scoring the assessments. Last, five expert reviewers were provided with the assessment questions and the GLCEs and asked to identify the question or questions that best addressed each content expectation. There was 80% agreement between reviewers’ matching and our alignment of assessment questions and GLCEs.

Economics and public discourse, decision making, and citizen involvement. This assessment measured student achievement of five economics and four public discourse, decision making, and citizen involvement GLCEs (we grouped these domains together for the sake of time) (see Appendix A). The assessment had 13 questions, measuring a total of nine GLCEs for a possible score of 36 (as each question was scored on a scale of 1 to 4). Examples of economics questions are: “There are lots of businesses in this community. Can you name some?” and “What

does a restaurant need in order to make pizzas? What does the restaurant need to sell pizzas? Now, which of those things you listed are natural resources? Which of those things are capital resources? Which of those things are human resources?" Examples of public discourse, decision making, and citizen involvement questions are: "Can you tell me any public issues in our community that affect you?" and questions related to a hypothetical public issue in which students needed to express a position on the issue and back the position with a reasoned argument

Procedures for developing the assessment and assessment rubrics mirrored those described for the civics and government assessment. Project members established an inter-rater reliability (87%) for scoring this assessment. Expert reviewers' identification of the question or questions that best addressed each content expectation aligned with our own at a rate of 72% (economics) and 87.5% (public discourse, decision making, and citizen involvement).

Reading. This assessment measured student achievement of three reading GLCEs (see Appendix B). Three members of the research team designed the assessment and revised it based upon other project members' input. The assessment consisted of 24 questions that measured the three GLCEs (because these GLCEs are multi-faceted, they each required many questions). We averaged scores on the responses to questions associated with each GLCE resulting in a score of 1 to 4 for each of the three GLCEs for a total possible reading assessment score of 12. Examples of questions are: "What kind of organization, or text pattern, does this text have?" and "Why did this author use a map in this text?"

Project members established an inter-rater reliability (92%) for scoring these assessments. There was 100% agreement between expert reviewers' identification of the

question or questions that best addressed each content expectation and our own alignment of assessment questions and GLCEs.

Writing. This assessment measured student achievement of three writing GLCEs (see Appendix B). Three members of the research team designed the assessment and revised it based upon other project members' input. It measured three writing GLCEs for a possible score of 12 (as achievement of each GLCE was scored on a scale of 1 to 4). Students were given a prompt to write a magazine article about how a food item is produced in a factory and were provided with a list of foods (e.g., potato chips, applesauce) from which to choose. The students were told that each of their responses would be included in a magazine to be given to another second-grade classroom. Students had 30 minutes to complete the task. Project members established an inter-rater reliability (92%) for scoring the assessments.

Data Collection Procedures

Student assessments. Assessments were administered before beginning the first project and after completing in the second project in all low-SES classrooms.¹ In three classrooms, this involved administration early in the school year in September and again in December of the school year. In a fourth classroom, this involved administration in February of the school year and again in late May, early June of the school year. In high-SES classrooms, assessments were administered in late May of the school year, after which social studies instruction for the year would have been complete or nearly completed. In the high-SES classrooms, the writing assessment was not administered due to time constraints.

¹ In one classroom, the teacher misplaced the writing assessments administered prior to implementation of the projects so for that classroom we have only post-unit writing assessments.

Classroom data. There were two sources of classroom data from the four low-SES classrooms: classroom observations and teacher interviews. There is one source of classroom data from the two high-SES classrooms: teacher interviews regarding instruction.

Classroom observations. Each low-SES classroom was observed by one researcher eight times on a weekly basis during the teaching of the projects. On average, the observed lessons lasted fifty minutes. The researchers' stances were that of observers. They took field notes about the instruction and the students' responses to the instruction, capturing as best they could the activities carried out, their length, and the language used. During the observations, researchers consulted the lesson plans we designed to determine whether and how the teachers diverged from them.

Teacher interviews. Two interviews per low-SES teacher were conducted: one after the first project was taught (mid-point interview) and one after both projects were taught (final interview).² The interviews served as data regarding teachers' implementation of the project-based units, but, given that this study was a design experiment, they also served as feedback for making changes to the units before subsequent implementations. During both interviews, we asked questions about the successes and challenges of the projects; how flexible the teachers found the project plans; the alignment of the projects with the GLCEs; how well the projects taught concepts in literacy, civics, and economics; the usefulness of the project materials supplied; the value of the culminating events; the ways in which they modified the plans; and what the teachers thought other teachers need to know about teaching the project that was not evident from the materials we supplied.

² The only exception was our first teacher, whom we only interviewed after both projects were taught, as she was the only teacher teaching the projects at that time.

We conducted one interview with the high-SES teachers. We asked questions about the frequency and duration of social studies lessons, the type of instructional approaches they used during social studies, and the GLCEs in literacy; civics; economics; and public discourse, decision making, and citizen involvement they taught during the course of the school year.

Data Analysis Procedures

Classroom observations. We analyzed the field notes taken during the classroom observations using a six-step interpretivist process (Miles & Huberman, 1994). First, one researcher (who had not conducted the classroom observations) read the field notes in conjunction with the curriculum plans, comparing what occurred in the classroom to what was written in the curriculum plans. As she did that, she noted discrepancies (i.e., when the teachers extended and diverged from the curriculum plans) and patterns (e.g., similarities across participants), creating a list of provisional codes that were descriptive. Second, she reread the field notes and the provisional codes and refined them (sometimes several comments were collapsed into one, other times a comment was expanded) into pattern (i.e., explanatory) codes (Miles & Huberman, 1994). Third, she shared the pattern codes with the research team for feedback and refined them based on their suggestions. Fourth, she reread the field notes a third time and cited instances from each classroom that reflected the codes on a matrix that listed each code and each classroom. Fifth, a second researcher (who had not conducted the classroom observations) read the entire set of field notes and cited instances from each classroom that reflected the codes on her own matrix that listed codes and classrooms. Finally, the two researchers compared their responses, resolving coding discrepancies, and combined the two matrices into one.

Interviews. After reading the analysis of the field notes (the pattern codes and instances of the pattern codes), the two researchers who had conducted the classroom observations read interviews with the teachers they had observed. They noted instances from the interviews that reflected the pattern codes on the matrix. We analyzed the interviews with the high-SES teachers by writing short memos summarizing the frequency and type of social studies instruction enacted.

Growth in low-SES classrooms. We use inferential statistics to compare achievement in social studies and content area literacy between pre- and post-tests of the students in the low-SES classrooms. Specifically, we use paired sample t-tests for comparisons between pre-test and post-tests within the low-SES classrooms. The assumptions for all analyses performed were met.

Low-SES vs. high-SES classrooms. We use inferential statistics to compare achievement in social studies and content area literacy between students in the low-SES classrooms and children in the high-SES classrooms. Specifically, we use independent sample t-tests for comparisons between the low-SES and high-SES classrooms. The assumptions for all analyses performed were met.

Results

Results of the study are reported in three sections: achievement growth of students in low-SES classrooms, comparison of student achievement in low- versus high-SES classrooms, and characteristics of the project-based units implemented in the study.

Achievement Growth of Students in Low-SES Classrooms

Our analyses of the pre- versus post-assessments of students from the low-SES classrooms showed that students scored higher on the post-tests than they did on the pre-tests in all three domains: reading, $t(42) = 8.56, p = .000$; writing $t(28) = 2.81, p = .009$; and social studies $t(42) =$

5.54, $p = .000$. See Table 2. The effect sizes are as follows: $d = .79$ for reading, $d = .47$ for writing, and $d = .65$ for social studies.

Comparison of Student Achievement in Low- versus High-SES Classrooms

Our analyses of the post-assessments showed that second-grade students from the low-SES schools attained statistically equivalent levels of achievement as students from the high-SES schools in social studies and reading (due to time pressures, we did not administer the writing assessment to the students in the high-SES schools and therefore did not compare achievement in writing). See Table 2.

Social studies instruction of teachers of high-SES students. To compare the achievement of the low-SES students to that of the high-SES students, we needed to know what social studies instruction looked like in the high-SES classrooms. We did not observe instruction but we interviewed the teachers about their goals in teaching social studies, how often they taught social studies and for how long, and what resources they used in their instruction. One teacher was in her fifth year, the other in her fifteenth year. Both teachers described teaching social studies content and skills that were grounded in the GLCEs. They tended to alternate when they science and social studies instruction (one teacher taught social studies every day, except for the two to three months of the school year when she taught science; the other teacher alternated between science and social studies on a weekly basis), so that each teacher taught social studies for an average of 18 weeks in the school year, with lessons averaging thirty to forty minutes. Both teachers described their instruction as active and student-centered (e.g., incorporation of technology, simulations, and field trips). They described using many and varied kinds of texts in their instruction.

Although neither the low nor the high-SES students fully met the GLCEs, we did demonstrate that after participating in the project-based curriculum, the low-SES students achieved at the same level, statistically speaking, as the high-SES students.

Implementation of the Project-based Units

After demonstrating that the students in the low-SES schools performed at statistically equivalent levels to students in the high-SES schools, we then turned to the observation and teacher interview data to help explain *how* teachers' implemented the project-based units.

Through our analysis of these data sources, we describe (1) features of the curricula we designed and (2) the ways teachers extended the projects by connecting them to students' lives beyond school and to other subjects.

Our project-based units. As we stated earlier, the two projects were revised, based on teacher feedback and data collected, after the first and second implementation. Here, we describe the projects as they were enacted in the third (and final) implementation.

The economics project, titled "Producers and Producing in Our Community," began with a teacher-led discussion about a local cause or charity that would benefit from a small donation. Then, in the project, students studied production and consumption in two ways: first, they learned about a local business and the ways it produces and distributes its goods (by reading about the business through the Internet and through a field trip); second, they created their own classroom business to sell a good or service they determined to meet an economic need of the school community. Students learned that they would earn money to donate to a charity of the class's choosing by producing and distributing a good or service. To determine what kind of good or service to sell, students conducted a survey of school members to determine an economic need they could meet (e.g., snacks they could sell). Students read informational texts,

wrote their own informational text about the business they visited on the field trip (to be shared with other classes that might visit the business), and engaged in class discussion. These experiences addressed content literacy goals related to learning about informational text purposes, structures and features, and economic concepts of business, producer, consumer, goods, services, natural, human, and capital resources, scarcity, opportunity cost, and specialization. As a culmination to the project, students held a sale of the good they produced. They then donated their profits to the designated local charity.

The civics project, titled “Children, Citizenship, and Communities” involved students in studying a local park and creating a multimedia presentation to deliver to a local government official proposing improvements to the park. The project began with a field trip to the local park, which included taking photographs of the park. Students determined a number of ways the park needed improvement. They then created a survey that asked school and community members to rank order the areas of improvement so that the students could target the most important improvement needed. The students then learned about the roles and responsibilities of departments in the local government to determine to whom they needed to address their proposal for improvement to the park. During the project, students learned about the role of government in helping make, enforce, and interpret laws, and in providing community services to citizens. Students were taught to distinguish between what the government is responsible for (collectively, for the common good) and what individuals are responsible for. Students engaged in a discussion about local issues in addition to the state of the local park (e.g., whether there should be a law against texting while driving; whether children should be allowed to bring toys to school), applying their understanding of core democratic values (e.g., liberty, common good) in meaningful ways. They also learned the features of a proposal and developed speaking and

listening skills as they developed and delivered the multimedia presentation.

The projects had similar features. Both were grounded in the study of problems, issues, or questions that had “real world” significance. They involved students’ exploration of a topic through data collection and field trips. Both projects were grounded in state content standards in social studies and content area literacy and integrated these two domains such that they worked together to achieve project goals. For example, to learn more about how to design a survey (a social studies objective), students read an informational text on survey design (content literacy); to learn how a certain good is produced (social studies), students read and discussed a book with the steps of production listed (content literacy). Both projects culminated with students’ creation of a product for which there was an audience beyond the school. Most lessons in both projects followed a similar format: they began with whole group instruction and discussion (usually 5-10 minutes); then guided small group or individual work (usually 20 minutes); and then whole class review and reflection (usually 5-10 minutes).

Teachers’ enactment of projects. Observations indicated that teachers generally implemented projects as described in project lesson plans. In addition to this finding, three patterns emerged regarding how teachers of low-SES students enacted the project-based curricula units designed to help students attain the same levels of achievement as high-SES students in social studies and content literacy. First, both teachers and students made connections between the projects and their world beyond school. Second, teachers, and sometimes students, made connections among lessons within the project, and between the two projects themselves. Third, teachers, and sometimes students, made connections between the projects and other school lessons. By making these connections, teachers built upon the principles of project-based approaches that emphasize application of the concepts to the world beyond school and to the

study of other subjects. The teachers naturally and authentically (i.e., in ways that were not contrived or forced) demonstrated to students that the content of these projects had relevance to other aspects of their lives and other school learning.

Connections between project-based approaches and the world beyond school. Although the projects as designed encouraged teachers to bring in examples from their lives and the lives of students where relevant, we observed that teachers and students made additional connections between the lessons and the students' lives beyond school. For example, in Chesapeake, the city in which one school in the study is located, there had been a major oil spill. During a lesson on the role of local government, several students made connections to the oil spill:

Teacher/Karen: We have city council members and judges. Our government protects us from unsafe places.

Student: Like cleaning up the oil that spilled in the river?

Teacher/Karen: People who own the oil are actually cleaning it up but they have to check with the mayor to make sure they did a good job.

Student: My head hurt going to Meijer.

Teacher/Karen: I know. I missed seeing the swans.

Similarly, Oren engaged his students in discussion of their recent visit to a local park as directed in the unit plans. During the class discussion of what they thought needed to be fixed, Oren attempted to help his students prioritize what to recommend for repairs to the park.

Oren/Teacher: When we went to the park, there were things we needed to fix.

Students: glass, wires

Oren/Teacher: Some things we needed to make changes. In my house things need to be changed. My wife wants to paint the house and get new windows. We want to add an additional bedroom.

Student: That costs money.

Oren/Teacher: I want to add solar panels but . . .

Student: It costs money.

Oren/Teacher: We have a lot to do so I make a list and prioritize. I do *a needs assessment* (writes on board).

In the interviews with the teachers after each project, teachers talked about how the projects had meaning for students' lives beyond school. For example, Karen stated, "...I think it was helpful to have the real world experiences, get the kids out in the community, get them excited about learning, and just seeing them apply some of the terms." Another teacher, Barbara noted similar results among her students. She explained,

They grasped, you know, a better understanding of economics, and . . . needs, wants. I mean the whole thing, needs, wants, producers, consumers. Like I said . . . the culminating activity of the trail mix was very useful because they were able to . . . see how to put something together, how to advertise, how to earn the money. How to take that money and then again you know, and again . . . spend it and . . . contribute to the, to your community and support your community by buying the toys for the school . . .

Connections between lessons within each project and between the two projects. Within each project, lessons were designed to build upon one another, and lessons later in the unit often referred to knowledge or skills taught in earlier lessons. There were also instructions within the unit plans to make explicit connections between the civics and economics projects. Oren and

another project teacher, Dave, remarked how the lessons naturally built upon and connected with each other. In his midpoint interview, Dave explained that, “things really flow together. They can be like, ‘Oh we did that when we were writing the other day.’” During the final interview, Oren discussed the projects overall:

Oren/Teacher: I think it was uh, more of like building blocks. This project was more like building blocks. They worked on one...They progressed to another, whereas most times it's isolation. Teach a lesson. They do it. They get a product. Then they go to the next one.

However, teachers found even more ways to build connections within and between projects. In an example of a within-project connection, following a tour of a local factory, Barbara explained to her class that they were going to make their own book describing what occurred there. To support her students in thinking about what the book might need, she explained, “We will probably want to make a diagram of [the business studied] like we saw at the end of the ice cream book,” a text used in an earlier lesson in the unit. Teachers and students also made spontaneous connections, not explicitly in the unit plans, between the economics and civics units. This was especially apparent in classroom discussions about the use of surveys: surveys were used in both projects, and when teaching the second unit, teachers often referenced the survey used in the previous unit:

Dave/Teacher: We started [the civics unit] with a survey. Why?

Student: To find out what people think. To collect information—like the goody bag [the goody bag was a reference to the good produced in the economics unit].

Oren/Teacher: If Ms. Hines and I had a disagreement, how would we decide?

Student: You [could] do both.

Oren/Teacher: You can't. There is an opportunity cost. How did we figure out what the fourth and fifth graders wanted for the movie [in the economics unit]?

Student: Voting

Student: Papers

Student: Survey!

Connections between the projects and other school lessons. As we observed students participating in the projects, we also noticed teachers connecting material in the projects to other school lessons and activities. When helping her students prepare to present their proposal for fixing a community park to a local government official, Karen compared their proposal presentation to the writing that students had been doing in class previously and to their consideration of audience. As another example, in talking to her students about natural resources—in this case, wheat—Barbara commented, “Wheat is a natural resource. Farmers cut down wheat. We’ve seen wheat because we’ve talked about this before. The milling company mills or grinds down wheat until it’s made into...” Her students replied, “flour.”

In addition to observing teachers help students make connections to other school activities, the teachers reported that their students used the project skills in other curricular areas. As an example, Karen noticed her students using the enumerative text structure from the project in their independent writing. Dave’s students also recognized text structures that they had learned in the projects in texts unrelated to the units. In his interview, Dave reported, “We were talking about [texts that have “first. . . second. . . third. . .] and then someone mentioned, ‘That’s like sequential text.’”

There was also evidence that students were using the project content to help them in extracurricular activities. In her final interview, Karen talked about her students who attend an after-school enrichment club, noting, “Some of the terms in social studies they could use easily because I heard them talking in enrichment. They do some social studies-based activities there and they’re talking about consumers and producers and they said, ‘Oh we already know that.’”

Discussion

As a result of our study, we know that it is possible to narrow the gap between low- and high-SES students on standards-based social studies and content literacy assessments in second grade. We have learned that this narrowing can occur in the context of standards-focused, project-based pedagogy. While teachers followed our project plans closely, we found that teachers augmented the projects by helping students make connections between the projects and the world beyond school, between and within the projects, and between the projects and other school subjects.

Our research confirms and extends the literature on project-based approaches. Pre- to post-test gains in social studies and content area literacy achievement, and a statistically non-significant difference between low- and high-SES classrooms at year’s end, adds to the literature suggesting the promise of project-based approaches on student learning across various subjects and grade levels (e.g., Boaler, 1998; Hernandez-Ramos & De La Paz, 2009; Hertzog, 2007; Okolo & Ferretti, 1996; Filippatou & Kaldi, 2010; Rivet & Krajcik, 2004; Shepherd, 1998). Our study is an important addition to this literature because it focused on domains—social studies and content area literacy—and an age group—young children/second graders—that have been the subject of relatively little research on project-based approaches.

In addition, our study makes a contribution in examining a project-based approach in classrooms serving high proportions of low-SES students. As explained at the outset of the paper, low-SES students have, on average, lower levels of social studies and content area literacy achievement. Moreover, social studies and content area literacy are particularly neglected in low-SES school settings. We developed an approach that simultaneously addresses both of these domains without an overwhelming time commitment (units were 20 – 21 lessons of 45 minutes each), and we examined the degree to which achievement of low-SES students experiencing this approach compares to achievement of students in high-SES settings. This is an important benchmark against which to compare achievement of low-SES students participating in classroom-based instructional research projects.

Given the unprecedented press to achieve specific standards, an important feature of our study was the use of standards to guide project-based unit development and as the basis for our assessments. As noted earlier in the paper, projects described in the literature have varied with respect to their alignment with standards, though one particularly successful project-based effort in this area was indeed standards aligned (Krajcik et al, 1998). A second important characteristic of our study was the examination of projects that were codified into detailed lesson and unit plans that could be used across several settings without losing characteristics of project-based approaches (e.g., all classrooms sought improvements to a local park, though the park and the nature of the improvements varied). Curricularizing project-based learning in this way makes it possible for teachers in many settings to use project-based units without developing them themselves. This may ultimately increase use of project-based approaches and render this approach more scalable.

Our analyses revealed that teachers did follow lesson and unit plans, but they also modified and extended the projects in their own ways in order to support student learning. Teachers' modifications and extensions confirmed the importance of authenticity and making connections between school subjects and between school and the world beyond school in project-based approaches (Barron et al. 1998; Katz & Chard, 2000; Krajcik et al., 1998). Our projects, as designed, were grounded in real-world issues and problems (i.e., how to improve a community park and selecting and producing a good/service to meet an unmet economic need in the community) and provided meaningful connections to other subjects and to the world beyond school. However, we found that the teachers took *additional* steps to make the projects meaningful and personal to students, perhaps reflecting their understanding of, belief in, and commitment to key characteristics of project-based approaches.

Implications

Our study has several implications for curriculum design, policy, and research with project-based approaches in early elementary learning in social studies and content literacy. With regard to curriculum design, we suggest two implications. First, our study developed specific curriculum materials that could be used to foster social studies and content literacy growth in the target areas. While we wrote the projects for schools in low-SES, urban school settings, with small changes, the projects could be implemented in rural or suburban settings as well. Second, our study may encourage development of additional, similar project-based units (that integrate social studies and content area literacy) for other content expectations and/or grade levels. Our study targeted only economics, civics and government, and public discourse, decision making, and citizen involvement; future projects could target history and geography (the other two domains of social studies). For example, a unit on history and content literacy could involve

students in an interview project of older adults to learn more about life in the past. A unit on geography could involve students in designing a travel brochure for their community or taking part in a campaign to improve the environment. We found the project-based approaches were broad and flexible enough to be used with a variety of content. The promise of these curricular units suggests that other project-based approaches may have similar benefits.

We suggest three implications with regard to policy. First, our findings might improve perceptions of the capabilities of students in low-SES school districts when provided with rigorous and relevant curriculum and pedagogy. Second, our study may foster greater attention to social studies and content literacy education in the primary grades, particularly in low-SES settings. As we described in the literature review, these areas are neglected in all elementary schools, but particularly those in low-SES settings. Our study may encourage educators to devote more attention to teaching and learning in these areas given that we know now children are capable of growth relative to content expectations in these areas in the context of project-based approaches. Third, our study may encourage educators to experiment with project-based approaches in other domains within their classrooms and schools.

With regard to research, we present two implications. First, our study may lead to greater interest in researching the implementation and effectiveness of project-based pedagogy, particularly with young children, in social studies and content literacy, and in low-SES settings. Second, this study may inspire greater use of design experiment (also referred to as formative experiment) methodologies. Our design reflected the six characteristics Reinking and Bradley (2004) identify of formative experiments: theoretical, interventionist and goal oriented, transformational, iterative, methodologically inclusive and flexible, and pragmatic. We found that using a design experiment approach to refine the curriculum after each implementation was

an effective way to improve and adapt the curricula to meet the needs of teachers and schools. Specifically, a design experiment approach allowed us to change, “mid-stream,” the format and content of lessons.

Limitations

Several limitations to our study exist. First, our sample size was small (though despite the small sample size, we were able to show effects). A larger sample size may have allowed us to be more precise about the size of the effects. Second, as we were committed, at this phase, to the affordances of a design-based research approach, we did not use an experimental design with experimental and control groups. A control group, achieved through random assignment to condition, would allow us to make strong causal claims that the present design did not. Third, we designed all the measures (including rubrics) for this project as none existed for second grade in content literacy and social studies that were aligned with the state content standards. Although we underwent a careful development process, including subjecting the measures to expert review, they do not have the degree of reliability and validity that many published measures have.

Conclusion

Existing research on project-based approaches suggested that this kind of teaching can foster higher engagement and yield academic gains. Our study confirms the promise of project-based approaches in neglected domains with a disadvantaged population. Although not our central focus, another added benefit of our projects is their attention to “the civic empowerment gap”—the disparity favoring citizens of middle and high SES in terms of their knowledge, skills, behaviors, and attitudes with regard to citizenship (Levinson, 2010), as the projects engaged students from low-SES backgrounds in making change in their communities through civic

channels. In the context of projects constructed to address specific learning standards and simultaneously have a purpose beyond school learning—a purpose in which children can assert or develop a means to impact the world around them—we found that students in low-SES settings could reach the level of achievement of their high-SES counterparts. Future research and development should aim to repeat this success with additional learning standards and domains, with attention to affective dimensions of engagement and motivation, at additional grade levels, and with large-scale experimental designs.

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Table 1

Schedule for Project Testing, Implementation, and Revision

	Civics	Economics
	Pre-Testing (Classroom A)	
First Implementation (February—June, 2010)	Classroom A	Classroom A
	Post-Testing (Classroom A)	
	Projects revised based on teacher feedback and other data collected	
	Pre-Testing (Classrooms B, C, and D)	
	Classroom B	Classrooms C and D
Second Implementation (September—October, 2010)	Revised based on teacher feedback and other data collected from Classroom B	Revised based on teacher feedback and other data collected from Classrooms C and D
Third Implementation (November—December, 2010)	Classrooms C and D	Classroom B
	Post-Testing (Classrooms B, C, and D)	

Table 2

Literacy and Social Studies Assessments in Low-SES and High-SES Classrooms

		Low-SES Pre-Test	Low-SES Post-Test	High-SES Benchmark
	<i>n</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Reading	63	4.02 (.61)	5.18 (1.09) ^a	4.84 (1.05) ^b
Writing	29	5.45 (1.88)	6.90 (2.04) ^a	-----
Social Studies	63	35.42(6.90)	42.21 (8.93) ^a	45.15 (8.99) ^b

Note: ^a denotes there are significant differences between the low-SES pre-test and the low-SES post-test in literacy and in social studies; ^b denotes there are significant differences between the low-SES pre-test and the high-SES benchmark in literacy and in social studies.

Appendix A

Michigan Grade Level Content Expectations, Social Studies

Content Expectation Identifier	Content Expectation Description
Civics	
2 – C1.0.1	Explain why people form governments.
2 – C1.0.2	Distinguish between government action and private action.
2 – C2.0.1	Explain how local governments balance individual rights with the common good to solve local community problems.
2 – C3.0.1	Give examples of how local governments make, enforce, and interpret laws (ordinances) in the local community.
2 – C3.0.2	Use examples to describe how local government affects the lives of its citizens.
2 – C3.0.3	Identify services commonly provided by local governments (e.g., police, fire departments, schools, libraries, parks).
2 – C5.0.1	Identify ways citizens participate in community decisions.
2 – C5.0.2	Distinguish between personal and civic responsibilities and explain why they are important in community life.
2 – C5.0.3	Design and participate in community improvement projects that help or inform others.
Economics	
2 – E1.0.1	Identify the opportunity cost involved in a consumer decision
2 – E1.0.2	Identify businesses in the local community.
2 – E1.0.3	Describe how businesses in the local community meet economic wants of consumers.
2 – E1.0.4	Describe the natural, human, and capital resources needed for production of a good or service in a community.
2 – E1.0.5	Use examples to show that people cannot produce everything they want (specialization) and depend on trade with others to meet their wants.
Public Discourse and Decision Making, and Citizen Involvement	
2 – P3.1.1	Identify public issues in the local community that influence the daily lives of its citizens.
2 – P3.1.2	Use graphic data and other sources to analyze information about a public issue in the local community and evaluate alternative resolutions.
2 – P3.1.3	Give examples of how conflicts over core democratic values lead people to differ on resolutions to a public policy issue in the local community.
2 – P3.3.1	Compose a statement expressing a position on a public policy issue in the local community and justify the position with a reasoned argument.

Appendix B*Michigan Grade Level Content Expectations, English/Language Arts*

Content Expectation Identifier	Content Expectation Description
Reading	
R.IT.02.01	Identify and describe the basic form, features, and purpose of a variety of informational genre including simple “how-to” books, personal correspondence, science and social studies magazines.
R.IT.02.02	Discuss informational text patterns including descriptive, sequential, enumerative, and compare/contrast.
R.IT.02.03	Explain how authors use text features including boldface text, graphs, maps, diagrams, and charts to enhance the understanding of key and supporting ideas.
Writing	
W.GN.02.03	Write an informational piece including a magazine feature article using an organizational pattern such as description, enumeration, sequence, or compare/contrast that may include graphs, diagrams, or charts to enhance the understanding of central and key ideas.
W.PR.02.01	Set a purpose, consider audience, and begin to use styles and patterns derived from studying authors’ craft when writing a narrative or informational piece.
W.PR.02.02	Develop a plan narrowing a broad idea for narrative and informational writing including graphic organizers that represent specific organizational patterns (e.g., problem/solution, sequence, description, or compare/contrast).

(Speaking and listening content expectations were also targeted, but were not individually assessed.)

Appendix C

Producers and Producing in Our Community

This 21-Session project teaches children economic concepts (e.g., *business, producer, consumer, wants, needs, goods, services, natural, human, and capital resources, scarcity, trade, profit, loss, opportunity cost, and specialization*) through the study of a community business and then the creation of their own “business.” With the ultimate goal of selling their own good or service, they begin by studying the goods or services the business produces, the resources needed to produce the goods, the means of distributing the goods, and the market for the goods. Students then take a field trip to the business during which they interview the staff and learn first-hand about how the business identified an unmet economic need and how they engage in production and distribution. They write a thank you note to the business for hosting them. Students read a variety of informational texts with some structures and features targeted in the Michigan Grade Level Content Expectations and upon returning from their field trip, they write an information book about the business. Then, students determine an unmet economic need in their school community and determine means of producing and distributing that good or service for profit. When producing the good or service, students draw upon what they learned studying the local business and design advertisements for the product, which are displayed around the school.

Children, Citizenship, and Communities

This 20-session project teaches students about citizens’ rights and responsibilities in their local community (e.g., city or town). They learn about the role of government in helping make, enforce, and interpret laws, and in providing community services to citizens. Students learn to distinguish between what the government is responsible for (collectively, for the common good) and what individuals are responsible for in their private lives. They study the responsibilities of their city’s departments (e.g., fire department, parks and recreation department, sanitation department) by reading information on the websites of the departments. Using a relevant and authentic public issue—improving their neighborhood park—students learn about public discourse and decision-making. They learn skills for determining the needs of their local community and taking steps toward meeting those needs through community involvement and government participation. Students read informational texts with some text structures and features targeted in the Michigan Grade Level Content Expectations about civic leaders (whose actions contributed to the common good). Students learn about proposals and write their own to address their local concern. As a culmination to the project, students invite a city council member or staff member from the parks and recreation department (or other city official) to their classroom so they can share their proposal for park improvements.