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The Wisdom of Class-Size Reduction

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In this study, the authors explore the implementation of a statewide class-size reduction program in nine high-poverty schools. Through qualitative methods, they examined how schools used class-size reduction to change staffing patterns and instructional programs. Requiring changes in space allocation, class-size reduction was accomplished through attention to pupil:teacher ratio, with classes ranging from 15:1 to 30:2 team taught. Most partner classes used tag-team teaching, with one teacher leading and the other doing clerical work. Working without specific professional development to enhance teaching in smaller classes, it made sense that teachers continued to solo practice. Class-size reduction is both a programmatic and instructional reform, and as such, it requires specific professional development to promote change.

KEYWORDS: class-size reduction, elementary education, professional development, team teaching

At the beginning of the day, 33 kindergartners stream into Room 23. Mrs. Alcott[1] heads to the rocking chair, and Mrs. Turnquist stands by the door, warmly greeting parents and children. Those on the rug begin the morning routine.

Mrs. Alcott: Good morning, Janelle.

Janelle: Good morning, Mrs. Alcott, I'm having hot lunch.

Mrs. Alcott marks the attendance and lunch count on the office sheet. But more important, she gives each child a greeting and a sweet smile. With 33 children, this can take awhile, especially if impatient 5-year-olds have something to say. After greetings, they write an equation on the board to represent the number of cold and hot lunches and the total number of children present today. Today there are 21 kids eating hot lunch.

Mrs. Alcott: 21—same as yesterday! Mrs. Turnquist, can I give this to you? (Mrs. Turnquist comes from her desk and takes the form to put it on the door.) OK, on your bottoms and look up here. The helper today has two c*'s in a row. Think about your name and spell it in your mind. I'll give you a clue. It's a girl.*

Becca comes up, writes her name on the message, then leads the group in the calendar activity. They then move on to the morning message. The group is beginning to wiggle a bit. They've been sitting for 20 minutes. Mrs. Turnquist is going through take-home folders at the back table.

Mrs. Alcott: I wrote another story last night—this one is a little longer.

She brings out a large pad with a story written in red marker. They talk about how the story has nicknames in it, and then they identify words in the story. Marla comes up and looks at the story, a bewildered look on her face.

Mrs. Alcott: Do you know what that word is?

Someone calls out, "Annie!"

Mrs. Alcott: I want Marla to do it. How about this one? It's on our word wall.

Mrs. Alcott continues to call on children to identify words they know—five more in all. Paul has his foot next to Jimmy's face. Jimmy ignores him. The group reads the story. Children scoot closer to the easel. Mrs. Alcott helps them read, making connections to word wall words, their names, and words they have seen before. Mrs. Turnquist comes to sit

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at the back of the group to help focus the reading. Children have things they want to say, and Mrs. Alcott tries to get to everyone. Waiting is hard. Mrs. Alcott separates children who are disrupting the group. They talk about quotation marks and find three places where they need to be inserted into the story.

Mrs. Alcott: Nice job. Let's get ready to do book boxes.

It's now 9:15, 45 minutes into the school day, and children are called five at a time for the next activity.

Earhart Kindergarten
Rapidly Improving
Pupil teacher ratio for this activity: 33:1
Official class size: 34:2

This is an example of a traditional start of the kindergarten day: individual greetings by the teacher, attendance, calendar, a morning message, and an additional literacy activity. These activities are paired with warm relationships with students in a high-expectation curriculum that values student experience. This vignette, abbreviated from field notes, was generated in the context of an evaluation of a class-size reduction (CSR) program. As we have worked to understand the implementation of this program, we have been puzzled by examples that seem counterintuitive to the logic of reducing class size. How is a classroom of 33 kindergartners, albeit with two teachers, an example of CSR? How do variants of team teaching embody the assumptions of CSR? How do schools choose implementation strategies when offered the resource of reducing class size? In this article, we attempt to respond to these questions, looking beyond the question "Does CSR work?" to examine the varied forces that shape implementation. In the process, we argue that CSR is not easily understood as a single treatment. Instead, it is a reform complicated by physical constraints of school buildings, the beliefs of teachers and administrators, and the elements of the policy itself. We begin by exploring the research context that supports class-size reduction.

Contemporary Understandings of CSR

CSR has been suggested by a number of researchers as a way to lessen the effects of economic and social inequities, to increase academic achievement, and to strengthen the foundational skills students develop in the primary grades (Achilles, Finn, & Bain, 1997; Biddle & Berliner, 2002; Molnar & Zmrazek, 1994). In the past 20 years, more than 30 states and the federal government have invested in CSR programs, focusing resources in Grades K-3 and infusing additional teachers into schools.

The first generation of research on CSR focused primarily on student outcomes (Molnar et al., 1999; Mosteller, 1995). CSR is linked with positive effects on student achievement (Biddle & Berliner, 2002; Finn & Achilles, 1990; Glass

& Smith, 1979; Grissmer, 1999; P. Smith, Molnar, & Zahorik, 2003) and both student and teacher attitudes (M. L. Smith & Glass, 1980; Zahorik, Halbach, Ehrle, & Molnar, 2003). The effects of small classes seem to be the most positive in the early grades and for African American students and students living in poverty (Biddle & Berliner, 2002; Finn, Gerber, Achilles, & Boyd-Zaharias, 2001; P. Smith et al., 2003) and appear to persist beyond the primary grades (Ehrenberg, Brewer, Gamoran, & Willms, 2001; Finn et al., 2001; Nye, Hedges, & Konstantopoulos, 2001).

A second generation of researchers recognized that teacher activity created opportunities for student learning (Achilles, Finn, & Pate-Bain, 2002; Zahorik et al., 2003). These studies recognize that student outcomes are leveraged through instructional practice. For example, Anderson (2002) noted that small classes would not, in and of themselves, solve all educational problems. What teachers do matters.

> Smaller classes provide opportunities for teachers to engage in practices that improve student achievement. Some teachers take advantage of these opportunities; others do not. When teachers take advantage of these opportunities, the likelihood of increasing student achievement is greater. When teachers fail to take advantage of these opportunities, it is smaller. It is what teachers do in and with smaller classes that make the difference, not simply being in smaller classes. (p. 52)

Some researchers argue that teachers use the same strategies with both larger and smaller groups (Cahen, Filby, McCutcheon, & Kyle, 1983; Rice, 1999; Slavin, 1989; Stasz, Stecher, 2002). Others assert that the most effective teachers in small classes spend less time on discipline, have clear academic and behavioral expectations, and use balanced instructional methods and higher degrees of individualization (Zahorik et al., 2003).

A third generation of CSR researchers broadens attention even further, recognizing that classroom practice is nested within school cultures that are shaped by teacher beliefs, principal leadership, and district or state policy. This position was well stated by Peter Blatchford (2003), who has examined British implementation of CSR:

> Our results suggest that it is not just down to the teacher. In contrast to a direct model, it is not entirely the teacher's responsibility; contextual factors cannot be ignored. Teachers will vary in their effectiveness, but the size of the class and the size of the groups in the class necessarily affect what a teacher has to deal with, and can present her with choices and the need for compromises. Class size is therefore one environmental contextual factor that will influence teachers and pupils in a number of ways. (p. 160)

From this contextually focused perspective, class size is an element of a complex system in schools, and its potential to affect student achievement is bound up within the system. Teacher action, student outcomes, teacher–student interaction, and the content of instruction are intertwined but in a

complex way (National Institute of Child Health and Human Development Early Child Care Research Network, 2004). To understand those relations, it is important to examine the mechanisms presumed to drive CSR.

Expected Mechanisms

CSR is premised on assumptions about the role of the teacher and the classroom environment in student learning. Smaller classes are thought to provide opportunities for more positive teacher–student interactions, with fewer disciplinary disruptions and more effort for teaching and learning (Wang & Finn, 2000). With more time on task, assessment-refined instruction, and closer personal relationships with students and their families, teachers are able to develop instruction tailored to the specific needs of particular students (Achilles et al., 2002). Students develop stronger affiliations with school, as they are more likely to develop an understanding of the cultural rules for being a student and dispositions related to success in classrooms (Finn, Pannozzo, & Achilles, 2003). In these positive contexts, teacher morale is higher, creating a recursive cycle of success for both teacher and student.

One wrinkle in the CSR literature has been about its definition (Achilles, 2003; Ehrenberg et al., 2001). What constitutes a reduced class size? As illustrated in the opening vignette, this seemingly simple issue has confounded our understanding of outcomes of this policy and has served as a source of contention among scholars, an opening for flexibility for administrators, and a practice morass for teachers. It is one reason there is disagreement about whether CSR works.

Two definitions, with distinct logics of action, are employed in discussions of class-size reduction. The first focuses on reducing group size. For this definition and related practice, fewer students are assigned to a class in the hope that teachers will develop an in-depth understanding of student learning needs through more focused interactions, better assessment, and fewer disciplinary problems. All of these are premised on the dynamics of a smaller group. In contrast, others use the idea of pupil:teacher ratio (PTR) as a proxy for CSR. From this perspective, keeping a ratio of students to teachers at a low level provides enhanced opportunities for learning. Less focused on student–teacher relationships, PTR is based on a view of teachers as units of expertise. Increasing the relative units of expertise available to students increases learning but is not reliant on particular teacher–student interactions. The opening vignette is an illustration of PTR implementation. Although group size and ratio are related, they involve different assumptions about how investment changes opportunities for students and teachers, and in our data, they imply quite different experiences. Class size directs attention to the environment for learning whereas PTR is typically an economic category illustrating the amount of money spent (Ehrenberg et al., 2001).

Many teachers learn to teach relatively large classes. Are the skills and strategies used with typical-sized classes successful with smaller groups? There is disagreement between researchers about the importance of professional

development for teachers to enhance outcomes in small classrooms. In Tennessee's STAR (Student Teacher Achievement Ratio) study, researchers found a limited relationship between professional development and student achievement (Finn, 2002), but other researchers have highlighted the importance of professional development in leveraging the power of CSR (Stecher, Bohrnstedt, Kirst, McRobbie, & Williams, 2001).

Given the costs related to CSR, some researchers have suggested that it is more effective to invest in teacher quality rather than change class size. Hanushek (1999) argues that despite significant reductions in the student:staff ratio in recent history, achievement has remained flat or declined. A number of researchers have pointed out the problems with this argument, noting that Hanushek is examining PTR rather than class-size reduction. Although teacher quality is at the heart of the effectiveness of virtually any reform, conflating PTR and class-size reduction misses attention to the mechanisms thought to be at work in smaller classes (Achilles et al., 2002). This issue will be a main point of the work in this article.

Unintended Consequences

Most of the consequences of CSR are positive, but the move to smaller classes is not always smooth. The increase in staff and in need for classroom space has stressed already fragile school systems, and in the case of California, has disproportionately affected the schools serving the most low-income English-language learners and students of color. Classroom space was taken from programs such as special education and art as well as from computer labs and libraries. Also, many schools were forced to install portable buildings at a cost higher than what was reimbursed by the state. Finally, the teaching staff increased by 38%, which precipitated a drop in the number of fully credentialed teachers (Stecher et al., 2001). We highlight these issues here because we focus in this article on the challenges of implementation and are very interested in both intended and unintended outcomes of the program.

Student Achievement Guarantee in Education (SAGE) as an Example of CSR

SAGE is a multifaceted legislative reform in Wisconsin aimed at reducing the impact of poverty on student achievement. Composed of four related strands, SAGE includes reducing classes' PTR to 15:1, making the school building available beyond the school day, developing a challenging curriculum for students, and encouraging professional development for teachers. The SAGE program currently serves almost 100,000 students in almost 500 schools. Any district in Wisconsin is eligible to participate in the SAGE program, with reimbursement based on the number of low-income children enrolled. Given Wisconsin's history as a local control state, districts have wide parameters within which they plan and implement their SAGE programs.

An example of the flexibility in the law can be seen in the definition of *class size*. The SAGE (2004) law defines CSR as "reduce class size to 15." In

practice, the Department of Public Instruction (DPI) allows four distinct configurations of CSR. The first, based on CSR logic, is a single teacher with 15 students in a classroom (15:1). The second has two teachers sharing a single classroom space but practicing separately so they maintain the CSR format of 15:1 in a much smaller space (30:2 shared space). The third is a PTR approach, allowing two full-time teachers in a classroom with up to 30 students (30:2 team taught). A final approach is a hybrid called a SAGE block approach, combining group size and PTR considerations. In this configuration, a part-time teacher is added to teach literacy and math, reducing class size in those core subjects. In some cases, the teacher has separate classroom space, and in others, he or she teams with the core classroom teacher.

As noted previously in the literature review, the positive effects of CSR are thought to be derived from closer relationships between teachers and students, more finely grained knowledge of student assets and needs, more opportunities to learn the cultural rules of being a student, fewer disciplinary problems, positive attitudes, and ultimately, more learning. Given these assumptions, how does a CSR policy get enacted in local contexts? In this article, we explore the local implementation of the SAGE program in nine high-poverty schools. We examine the following questions:

- How is teacher action related to the resource of CSR?
- How is this resource facilitated or constrained by physical layout of the school?
- How is implementation shaped by educator beliefs about team teaching and working with colleagues?

Method

> Our research suggests that it is not likely, or realistic, to think that one theory or conceptual framework will account for effects. Class size effects are, in other words, *not singular but multiple*. Accordingly, we shall need multiple theoretical or conceptual frameworks to account for these effects and to judge their implications, such as those connected to teaching, pupil attentiveness and social relations. Further, the different effects may have conflicting outcomes . . .and different effects can themselves affect each other. (Blatchford, 2003, p. 157–158)

Each year, the funding for the SAGE program includes support for program evaluation. The 2004-2005 evaluation focused on issues of local implementation. We based our work on the following guiding assumptions:

1. CSR alone is insufficient to promote student achievement. Improving student achievement requires substantive changes in teaching methods that take full advantage of smaller class sizes (Pate-Bain, Achilles, Boyd-Zaharias, & McKenna, 1992; Robinson, 1990). Given that schools are institutions with strongly held roles and structures (Lortie, 1975/2002;Waller, 1932), just changing the number of children in a class is unlikely to change the time-honored practices of educational professionals.

2. CSR may have unintended consequences. Organizational changes related to service delivery often have unintended consequences. Staffing, space, materials, staff collaboration, and density of children with special needs are all affected by CSR, and learning from successful practice should help leverage more effective use of the resources (Archibald & Odden, 2000; Capper, in press; Capper, Keyes, & Fratura, 2000).
3. Generalization of the SAGE program requires careful adaptation. We have the most to gain from studying successful implementations of the SAGE program if we recognize that generalization from one classroom to another is complex and requires careful attention to the specific context.

Our work involved instrumental case studies of practice in nine high-poverty schools in urban, semiurban, and rural communities. The schools were chosen to represent a range of student achievement on statewide tests at Grades 3 and 4: high achieving (relative to expectations), rapidly improving (20% increase across 3 years), and low achieving. Within those schools, we asked the principal to nominate a kindergarten, first-grade, and either a second- or a third-grade teacher who represented the teaching practices of the school. We stated that we were not interested in only the superstars; we wanted to best understand the practices that illustrated the culture of a particular school. One of the elements woven into these sampling choices was having examples of the varied ways that the SAGE program can be implemented through varied classroom configurations. This criterion-based design merged attention to sampling to represent patterns in the population of interest with qualitative sampling that works to understand the specificity of the case (Erickson, 1986). The characteristics of the school and classrooms are presented in Tables 1 and 2.

The goal of data generation was systematic description of instructional practice, organizational strategies, and social context related to the mechanisms that produce student achievement in SAGE classrooms. Although the classroom is the unit of analysis in this project, we recognized its location within other contexts. Therefore, the project examined the links between what happens in the classroom and other relevant factors of school life (administrative decision making, physical space constraints, etc). Data generation activities included the following:

- Eight half-day visits to each classroom across the 2004-2005 school year for observations of all educational activities, detailing the physical environments, instructional activities, and interactions.
- Standardized assessment of environments through the use of the Assessment of Practices in Early Elementary Classrooms (APEEC; Hemmeter, Maxwell, Jones Ault, & Schuster, 2001) and Early Language and Literacy Classroom Observation Toolkit (ELLCO; M. W. Smith & Dickinson, 2003)
- Collection of artifacts (e.g., lesson plans, curriculum, examples of home–school communication, report cards, assessment instruments, photographs).
- Interviews with classroom teachers (two), principals (three), and a sample of students (one). Descriptions of the interviews are provided in the appendix.

Table 1
Sample Schools

School	Bethany	West Canton	McMahon	Earhart	Calloway	Montford	Allerton-Farwell	Wellstone Blvd.	Gallows
Achievement	High	High	Improving	Improving	Improving	Improving	Low	Low	Low
Geography	Urban	Rural	Semiurban	Semiurban	Urban	Rural	Rural	Urban	Urban
District	Mallard	West Canton	Bellamy	Maxwell	Mallard	Walton River	Allerton-Farwell	Mallard	Mallard
Years SAGE	4	4	4	4	4	4	6	6	4
Grade span	K4-06	E4-06	KG-05	KG-05	K4-05	E3-06	E4-12	K4-05	K3-08
2004 Enrollment	514	340	237	238	276	385	460	556	557
% Black	74	0	27	18	19	2	0	57	67
% Hispanic	2	0	9	10	34	0	6	23	19
% ELL	7	0	3	33	9	11	0	37	1
% S/Dis	9	21	24	8	22	9	21	16	38
% FRPL	83	40	57	62	75	61	65	96	82
Wisconsin third-grade reading comprehension test 2001 to 2004, percentage proficient and advanced									
Mean	73	85	74	69	77	66	68	35	38
SD	12	4	7	12	9	12	8	11	10
Wisconsin fourth-grade knowledge and concepts test 2001 to 2004, percentage proficient and advanced (reading)									
Mean	88	87	76	68	77	71	68	46	35
SD	7	4	10	14	17	12	7	14	4
Wisconsin fourth-grade knowledge and concepts test 2001 to 2004, percentage proficient and advanced (math)									
Mean	79	80	60	59	69	54	55	27	26
SD	22	7	17	13	17	19	4	9	8

Note. All names for districts and schools are pseudonyms. ELL = English-language learners; S/Dis = Speech/Disability (special education); FRPL = Free/Reduced priced lunch.

Table 2
Classroom Configurations in Sampled Schools

Achievement	School	Grade K	Grade 1	Grade 2 or 3
High	Bethany	Elizabeth Alijan and Crystal Stevens 30:2 TT	Bart McMullen and Linda Feller 30:2 TT	Patience Carter 30:2 SS (third)
	West Canton	Sarah Ayermeyer 15:1	Barb Marquist 15:1	Jenny Krzinski 15:1 (second)
	McMahon	Alice Kastenbach 15:1	JoAnn Ludwig 15:1	Sharon Sellers 15:1 (third)
Rapidly improving	Earhart	Annie Alcott and Angela Turnquist 30:2 TT	Elsa Root 15:1	Lauren Rich 15:1 (second to third multiage)
	Calloway	Linda Trainer 15:1	Gloria Hall 15:1	Marsha Delton 15:1 (third)
	Montford	Nancy Giles and Karen Martin 30:2 TT	Nina Caster and Diane Felton 30:2 TT	Bridget Bonkowski SAGE block (second)
Low	Allerton-Farwell	Chris DuPont and Tammy Ferin 30:2 TT	Maureen Mulroney and Dana Read 30:2 TT	Darren Delmar 15:1 (third)
	Wellstone Blvd.	Eileen Manchester and Cherie Harmon 30:2 TT	Na Vang Xio Vang 30:2 TT	Ellen Grace 15:1 bilingual (second)
	Gallows	Pauline Alston 15:1	Carrie Larson 15:1	Mariann Hillington 15:1 (second)

Note. All names for districts, schools, and participants are pseudonyms. TT = team taught; SS = shared space.

This articles relies primarily on the interviews with administrators and teachers, observations, and the standardized environment ratings conducted across the school year. The other sources of data serve as background to our understanding but are not presented in our arguments here.

Data Analysis

Our analysis followed generally accepted forms of qualitative inquiry, with both inductive and deductive components (Erickson, 1986; Graue & Walsh, 1997). Supported by the qualitative research software NVivo, analysis focused within and across case studies, grade levels, and classroom configurations. Data from the diverse sources were read and reread, examined

through the assumptions that guided the evaluation design and for specific patterns that emerged through fieldwork. Given the purposeful sampling used in the design and the multiple types of data collected, the case studies and cross-case analysis provide triangulated inferences based on multiple sources and interpretive strategies. This type of analysis provides the appropriate foundation for transferability (Guba & Lincoln, 1989) from the specifics of local practice to other sites and experiences because it is richly descriptive and comparative. The case studies provide rich information on how, and for whom, SAGE works.

In the next section, we describe contextual forces that shaped the practice in each of the schools and classrooms we studied. We examine how reducing class size intersected with the realities of physical space and educator beliefs to produce locally specific versions of CSR practice.

Findings

Teaching Practice Is Shaped by More Than the Number of Students

Schools might be thought of as ecologies of practice, where changing one element has ripple effects throughout the system. Our experiences in SAGE schools illustrated the utility of this metaphor. SAGE implementation took place in distinct local contexts, reflecting the physical, social, and intellectual resources in that time and space and mirroring the expected mechanisms and the unexpected consequences in the literature. Our analysis focuses on the role that physical space plays in a CSR program, examining how the increase in class sections must accommodate the very real limits of space in modern elementary schools. These limits and administrative innovation shaped the SAGE configurations chosen and led to particular challenges in contexts where team teaching was required. We examine these challenges in relation to the presumed mechanisms at work in CSR teaching and learning and relative to the formal support provided for teachers and administrators in the SAGE program.

Although our sampling plan was organized by achievement levels and whether a school was urban, semiurban, or rural, we found that there was not a simple, linear relationship between these characteristics and either SAGE implementation or specific teaching strategies. The one pattern we can point to from supplementary analysis from this project is that principals in high-achieving and rapidly improving schools were more likely to propose innovative strategies to meet the space challenges introduced by the SAGE program, whereas principals in low-achieving schools were more likely to rely on tradition for the allocation of space (Burch & Theoharis, 2005). Beyond that, the relations are muddier.

We can think of several reasons for this. School achievement was measured through schoolwide performance on tests given at third and fourth grade, representing an accumulation of experience across between 8 and 10 years of life (effects of poverty, nutrition, preschool experience, varied curricula and teaching practices). Class-size configuration is but one small element in the system that produces student outcomes. Fewer than half of the schools in our sample used a single SAGE configuration across Grades K-3,

so even the SAGE configuration did not remain constant. Given the individuality of teaching practice, even in an era of standards-based accountability, we found that our studies of classroom practice, though related to school culture, could not be explained by the test scores or measures of standardized observation. This lack of connection between school achievement and administrative and teaching strategies has prompted us to include a longitudinal testing dimension to our work in the future so that we can follow teaching practice and achievement in a more synchronous way.

Space

When class size is reduced, the number of classrooms increases in SAGE schools. In elementary school buildings that have finite space, this can be a challenge. At Earhart Elementary, if SAGE were not available, there would be two sections of kindergarten serving 44 children. With SAGE, there is one K-1 section that serves 10 kindergartners (and 5 first graders) and a 30:2 class with 34 students. Multiplied across the K-3 grade span, SAGE increased the number of classrooms at Earhart from 8 to 12. Schools coped with this challenge in a variety of ways, using the configurations suggested by the DPI.

Four of the schools solely used 15:1 configurations, prioritizing the core classroom as site of investment for CSR. These schools used strategies such as building renovation and construction to create spaces for 15:1 classes. They also shifted space for specials classes to classroom space by having music and art teachers provide instruction within the K-3 classroom. Finally, some schools doubled up their class sizes for art, music, and physical education. For example, at McMahon and Calloway, all classes K-3 were 15:1 configurations, and the following strategies were used: Specials doubled up the 15:1 classes, meeting two sections at once; art and music instruction occurred in the regular classroom, with the teachers working off a cart; and two regular classrooms were subdivided to make three new spaces. Bill Post, McMahon principal, noted that recent budget cuts and the district's interpretation of the SAGE law led to the double-up specials approach:

> When SAGE was initially designed, they always said that it was just for the academic classes. And so it was always a luxury to have had the small ones in there [art, music, physical education]. But we were able to, within the districts staffing, we were able to keep everybody separate. But this year they cut one more specialist at the elementary, they cut one art, one math, one music, and one [physical education]. They might have cut even more than that and so they had to do a strict enforcement of the SAGE rules, which says you don't get that luxury of 15 to 1 [in specials].

In classrooms with sufficient space, the environment is a resource that supports instruction. Regardless of whether the teacher used teacher-centered whole-group instruction or activity-based small group teaching, classroom space can be thought of as a teaching assistant. It provides opportunities for

individualized instruction by giving children a bubble in which to learn—a space of their own to interact with materials, to think, to learn. Depending on the classroom and activity, this bubble can be a place for students to work individually or collaboratively. Space provided an environment with discrete activity areas. In kindergartens and first-grade classrooms, these typically included a rug area for the group to gather for stories and calendar, and in all grades, regardless of whether students worked at desks or tables, there was more than sufficient room for their activity. Space beyond the main work areas was used for individual and small group activities: for reading, for block building, for games. In classic early childhood style, the environment was part of the instructional design, used to facilitate student movement, to set boundaries, and to help students focus. The following example illustrates how space provided opportunities for children to spread out and learn.

> *Ms. Hillington has hung a very large sheet of construction paper on the board. "Today we are going to do something like symmetry—tessellations." She takes another piece of paper and cuts out a shape, traces it several times, then colors what she has traced. The children watch intently.*
>
> *Ms. Hillington: Get a small piece of paper from recycling and scissors. (She shows the class again how she traced her shape repeatedly on the large piece of paper.) See how it all fits together? It looks groovy any way you turn it. What is this called again?*
>
> *Samuel: I forgot.*
>
> *Hope: Tessellation.*
>
> *Ms. Hillington: Who can tell me what that means?*
>
> *Tabia: Keeps repeating itself.*
>
> *Ms. Hillington: What is special about it?*
>
> *Tabia: It comes together.*
>
> *Ms. Hillington: Like a . . . ?*
>
> *Samuel: Puzzle!*
>
> *Ms. Hillington: Any shape works but the easier way is to have an angled corner, not rounded.*
>
> *With large construction paper distributed by Ms. Sears, the class begins cutting out shapes and placing them on the paper. Ms. Hillington does a second demonstration for children who have questions. The children are working on projects all over the room. There are moments of*

> *silence as well as many quiet conversations as children ask questions or share their creations with one another. Both teachers circulate around the room working with different children, wherever they need support.*
>
> *Juan, one of the quietest boys in the room, has spread his paper across several desks and is creating a green and purple design. Today he calls me over to see his design.*
>
> *Hope uses the top of the bookcase as her workspace. She slides the paper down or up depending on which section she is working. She makes her design in shades of pink and red.*
>
> *James sits at the large writing table at the back of the room. He bends over his paper and works intently the entire time.*
>
> *Samuel and Isaac work side-by-side. Both stand to do the project and they continually move to examine how the projects evolve from multiple perspectives.*
>
> *A number of the students have identified disabilities that some would think might get in the way of this activity. Not today!*
>
> *At 11:25, Ms. Hillington tells the class that they only have a few more minutes.*
>
> *Ms. Hillington: We worked our cachungas off this morning!* (Ms. Hillington's second grade, Gallows Elementary)

This example shows the teacher and students using available space as an aide to teaching. The tracing activity could have been done on an 8 × 11 piece of paper at individual desks, but it would have been less effective with second graders. The students could be independent because they could choose the space most appropriate for them. As a result, the teachers could interact with them on substantive issues rather than disciplinary problems. Pairing a smaller group size with adequate space allows teachers to tailor activities that differentiate instruction, promote social problem solving, and allow for divergent modes of learning.

More challenging were the 30:2 models of shared space and team teaching. To accommodate the increase in classrooms, five schools used a combination of large and small classes, with the large classes requiring teachers to team teach or to divide up the space with temporary walls. These 30:2 configurations had strong impacts on teaching and learning. Almost every teacher and administrator talked about space as a challenge in SAGE schools. When asked about the challenges presented by SAGE, Lauren Rich, a second–third grade teacher at Earhart, used a clever play on words to link SAGE, the use of space, and instructional wisdom:

> The space is a bigger issue. I do think that yes, we have SAGE, yes it's wonderful, but to get into a situation where my classroom that has 17 students in it now will be forced to have 30 students in it and two adults teaching at the same time—I think that is certainly not—that doesn't seem sage to me. You know SAGE, being an acronym, I understand, but it also means "wisdom." And that is not wise. That is not wise to put all these people into one small, one space. A space meant for one class becomes a space for two. I don't see that that's really manageable, in the best interest of the kids. (Mrs. Rich, Earhart, Grades 2 and 3)

Mrs. Rich questioned the logic of putting two classrooms into a small space, a situation experienced by her first-grade colleague, Elsa Root. Earhart was a small neighborhood school that used every available space for classrooms, specials, and special service instruction. Ironically, the building sat on a huge grassy lot that had essentially three playgrounds' worth of space. Several of the teachers bemoaned the fact that they couldn't build on it to increase the capacity of the school itself. As the school was stretched to incorporate SAGE into its work, the teachers were presented with a space challenge. Paula Everett, the principal at Earhart the year before our study, described some of the decisions that shaped space in a SAGE context:

> Prior to SAGE, we had a little theater area where students would do performances and gather for assemblies and things. And what needed to happen, again, the year before I came on board—that area was leveled to make that an additional classroom space. . . . Certainly that is a real challenge for me in this building. We're overcrowded, and we're finding an adequate number of classroom spaces is often difficult. One of the downfalls of this is that we've had to have a few classrooms be classrooms that technically aren't classrooms.

In the previous year, a 1,000-square-foot classroom was divided by file cabinets to make two first grades. Mrs. Root was one of the teachers assigned to teach in that space. The room's strange shape, paired with its division, made for awkward room arrangement and use. Mrs. Root described the frustrating experience:

> I went to a first-grade teachers' conference last year and they had so many ideas for these neat things to do in your room. And last year I had nowhere. I had four tables in there and my desk and a little carpet space and it's like, where are you going to put all of these things? You want a reading corner, an art area, and a science area. There were some times where I would get lost in what I was reading because I would hear what they were doing [on the other side] and we'd try to plan it where we would have our story time at the same time, but then I would be hearing her read her story.

Mrs. Root also noted that because the bathroom was on her side of the room, children from the other class frequently entered the cluttered space to use it.

Conversely, the telephone was on the other side of the divider. Things that she needed always seemed to be where they were not.

During the year of our study, Mrs. Root moved to a regular classroom space, and Mrs. Alcott and Mrs. Turnquist shared the large classroom. Mrs. Root described how different her experience was in a new environment:

> Oh, so much better—I mean, there's just so much more room and not so many distractions. Just by the way I can organize my things and I've got a reading corner where the kids can go to and I can have an adequate gathering place on the carpet so they're not right up to the chalkboard . . . anyway, the adequate space for a word wall, I hardly had space on the bulletin board over there at all . . . So more space—more space works wonders.

The issue of space was highlighted at other schools as well. At the beginning of the year, Mrs. Carter, a third-grade teacher at Bethany, described the challenges of sharing a classroom in a space meant for one class:

> Since I share a room, my class is squeezed into a smaller area and I have to store books and other materials at home and in my car. I have no space for centers. Additionally, since 6-foot dividers are used to section off the room, the noise level is unacceptable. Also, since the TV door, sink, and phone are located on the other side of the room, I have limited use of them.

She elaborated on the issues when we talked with her at the end of the year:

> Normally I am able to set up centers in my room. . . . For example, I had a big state map. And the children can go over there and there would be questions. You know, "Where do more potatoes come from?" . . . While they were doing that, some other kids might be working on a science project over here. I could work with those who needed help. But I can't do that at all in this little area. I can't even have a spot to put our science projects. So that has been a big test to my philosophy. I can't do a lot of individualized things, because I can't pull the kids and have other kids really learning. My biggest regret this year is that I didn't have space for tutors in my classroom. So, I only have two tutors this year on Monday and Wednesday . . . and they have to go in the hallway.

Imagine having your office situated in such a way that you had to go through a colleague's office from the hallway. Furthermore, imagine that you shared a telephone and that it was not on your side of the divider. Finally, imagine having your office semiopen to your neighbor's so that you could hear virtually every phone call, meeting, and so on. Just as this would not be an optimal situation for you, it was not optimal for these teachers. In another twist of fate, the partner classes tended to be kindergarten, the grade that had the most equipment (thus requiring more space) and the noisiest activities.

Space was an integral part of the implementation of the SAGE program. In the high-poverty schools that had received resources to reduce class size, the power of the reform was constrained by square footage in a school and the ability to shift space to central instructional activities. Administrative decision making was key in this process, sometimes facilitating teacher ability to make the most of CSR through innovative use of space across instructional staff and other times wasting opportunities by being unable to move beyond tradition in space allocation (Burch & Theoharis, 2005).

Configurations and Quality

To complement our participant observation analysis of practice, we also administered two standardized environment instruments, APEEC (Hemmeter et al., 2001) and ELLCO (M. W. Smith & Dickinson, 2003). The APEEC evaluates the use of developmentally appropriate practices (Bredekamp & Copple, 1997) by rating the classroom physical environment, instructional context, and social context through observation and teacher interview. A composite score represents the average rating across 16 items on a scale of 1 (*inadequate*) to 7 (*excellent*) (interrater reliability $r = .86$). The ELLCO describes the support available to young children for their language and literacy development. It is composed of three distinct sections. A 24-item literacy environment checklist is reported as a total score with a minimum of 5 and a maximum of 40 ($r = .84$). The classroom observation and teacher interview targets high quality classroom literacy practices, resulting in a composite score ranging from 1 to 5 ($r = .90$). The Literacy Activities Rating scale describes the number of book reading sessions and writing activities conducted during an observation with a potential score range of 0 to 13 ($r = .66$).

We were interested in the degree to which instructional quality was related to SAGE configuration and used these ratings as one way to portray those relations. In Table 3, we present the average APEEC and ELLCO ratings for 15:1 and 30:2 classrooms by grade level. We chose this strategy given the patterned differences in scores and practices across the K-3 developmental span. We have chosen not to do tests of significance on these comparisons given the interpretive approach taken here, the sample size, numbers of comparative categories, and unequal cell sizes.

Across the two instruments, the 15:1 classrooms had slightly higher ratings in all cases except for one. This pattern is interesting given the diversity among classrooms within and across configurations, with teachers in a given group using teacher-centered approaches such as direct instruction (DI), more student-centered practices such as balanced literacy, and everything in between. Paired with our observations of teacher practice, it could be argued that the smaller classes provided richer student–teacher interaction than was available in the larger groups. One structural element of interest that might have affected the ratings is that a number of the 30:2 teachers told us that supply funding was calculated on a classroom rather than per-pupil basis, so that a class with 15 received the same funding as a class with 30. These

Table 3
APEEC and ELLCO Ratings by Grade and Configuration

	Grade K			Grade 1			Grades 2 to 3		
	M	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*
APEEC									
15:1	5.8	.28	4	5.4	.57	5	5.1	.68	9
30:2	4.6	.93	5	4.7	.45	4			
ELLCO Literacy Environment									
15:1	26.3	3.80	4	23.6	6.80	5	2.1	5.50	9
30:2	21.6	4.90	5	21.0	6.00	4			
ELLCO Classroom Observation									
15:1	3.8	.53	4	3.5	.85	5	3.4	.67	9
30:2	3.2	1.04	5	3.1	1.07	4			
ELLCO Literacy Activities									
15:1	10.5	1.73	4	9.0	1.22	5	8.7	1.87	9
30:2	10.0	2.83	5	10.0	1.41	4			

Note. APEEC = Assessment of Practices in Early Elementary Classrooms (Hemmeter, Maxwell, Jones Ault, & Schuster, 2001); ELLCO = Early Language and Literacy Classroom Observation Toolkit (M. W. Smith & Dickinson, 2003).

ratings of environmental richness could reflect, in part, the need to split resources in ways not necessary in 15:1 rooms.

Implementing SAGE Through Two-Teacher Classrooms

U.S. schools are often characterized as egg-crate cultures, where individual teachers do their work behind closed doors. An ethos of autonomy and individuality pervades much of teaching, and this collided in important ways in SAGE contexts, where teachers were required to double up and teach larger groups of children together. This PTR approach to a class size reform, necessitated by space limitations, was shaped by individualistic ideas about teaching and was left unperturbed when professional development related to CSR was not provided.

Colleague coverage. Another challenge for the 30:2 classrooms was the perception that one of the team members was expendable when teacher absence was an issue. In four of the five schools using the 30:2 model, teachers in the partner rooms were routinely used to cover absences. At Bethany, though rarely an issue, the 30:2 teachers preferred to cover for partner absences. At Allerton-Farwell, Montford, and Wellstone Blvd., partners covered for each other, and they were pulled to cover absences in other classrooms. This meant that rather

than having 30 students and two teachers, at times these classrooms had 30 students and one teacher. Why is this important? If CSR is a treatment, the treatment is compromised if you do not regularly get the full dose.

An example of how this played out highlights the problem. At Wellstone Blvd., all staff members were assigned a DI group. During the DI block, these small groups worked on very specific lessons. Unfortunately, no backup plan existed to cover staff absence. If staff were absent, the principal announced that their assigned group wouldn't have DI that day and students were left on their own—no one was assigned to cover them and no work was given to the students. A model that was designed to individualize instruction in fact resulted in less instruction for some students, and nothing in the SAGE program could change that.

Tag-team teaching. In all but one of the 30:2 classrooms and in the SAGE block configurations, teachers used what we call "tag-team teaching." According to Answers.com, tag teaming involves "a team of two or more wrestlers who take turns competing against one of the wrestlers on another team, with the idle teammates waiting outside the ring until one of them is tagged by their competing teammate" ("Tag Team," 2005). Although some might resist comparing professional wrestling and teaching in the primary school, the metaphor of teachers taking turns with a group of students is apt. In these classes, the predominant model of large-group teaching was of one teacher "running" the class while the other supported discipline or did clerical tasks.

In the following vignettes taken directly from observations in a kindergarten and first grade in a rapidly improving school, we illustrate how the use of tag-team teaching reduces opportunities for instructional interaction compared to coteaching strategies. Both vignettes represent literacy activities in the primary grades during a common task, the morning message. In the first example, from Nancy Giles and Karen Martin's kindergarten classroom of 27 students, the teachers coteach, splitting the large group into two smaller groups for instructional purposes. At the time of the vignette, Mrs. Giles is working with 10 students in the classroom while Mrs. Martin is in a space out at the end of the hall doing the same morning message and activities with the rest of the class.

> *Mrs. Giles turns her attention to the easel that contains the* Daily News. *She begins by having the students look at the first line: Today is Monday, September 27, 2004. She reads it aloud, following with a pointer. She then asks the students to read it aloud with her. Next, she encourages the children to make observations about the sentence. The children take turns looking and drawing conclusions about the letters that are in the sentence as well as in their own names. Each of the ten children in this group makes an observation. Some circle letters, and others circle words that they recognize.*
>
> *After all have studied the sentence, Mrs. Giles turns to the next sentence: The weather is _____ and _____. Mrs. Giles asks the children*

to help her fill in the blanks. Oscar offers "sunny." Mrs. Giles comments that "sunny" is an excellent choice, and she writes it into the first blank. Jerome proposes "cold." Mrs. Giles hesitates and asks the child if he wore his mittens and snow boots to school. He replies that he didn't. She asks if he wore his winter coat. He shakes his head no. Mrs. Giles suggests that they amend the answer to "cool." The children agree, so Mrs. Giles fills the blank with "cool." She rereads the sentence and has the children read it again with her. Finally, Mrs. Giles asks Claue to create a sentence for the group to "think about." He says, "My shirt glows in the dark." Mrs. Giles writes on the easel: Claue said, "My shirt glows in the dark." *She asks Claue to step out his sentence to help them observe its length. He skips to the edge of the carpet and, as the students chant his sentence, Claue takes one step for each word. Mrs. Giles comments that he has created a wonderfully long sentence (Claue takes really big steps). The message continues with students creating, stepping, counting and discussing their sentences.*

Kindergarten at Montford
Rapidly Improving School
Pupil-teacher ratio for this activity 10:1
Class size 27:2

In contrast, in the vignette below, a first-grade teacher, Nina Caster, attempts to engage 22 students in a similar task as her teaching partner, Diane Felton, is in and out of the classroom, attending to other business.

Mrs. Caster asks the children to find their learning spots. Each of the 22 students moves into assigned position in rows on the carpet facing their teacher and her easel. Danielle hides behind a desk and needs to be reminded to "make a good seating choice." She moves out from behind the desk. Mrs. Caster continues, taking a pointer with a funny-looking rubber hand stuck to the end. She begins to point at a sentence that has been written on the easel. She stops to ask Josh to pay attention. She moves back to the message:

Wednesday, September 14, 2004.

Good morning children. We talked about cooperation yesterday. Today we will practice. Our parents are invited to a meeting after school today. Have a happy day! Mrs. C and Mrs. F.

Mrs. Caster asks volunteers to read the various parts of the message. She pauses to send Auggie to a "time away," as he has been pushing students at the back of the group. He moves to the back of the room, and Mrs. Felton, who has just come in the door, talks with him quietly. He soon returns to the group, and Mrs. Felton heads to her desk to go through student folders. Mrs. Caster turns back to the group, still waiting

for a reader. She gets no response. She prompts the group by saying, "C'mon team 130 (the classroom number)." She waits. "Who wants to volunteer?" This doesn't inspire the children, so Mrs. Caster begins reading the message herself. She pauses before the last two sentences, looking expectantly at the children. Sandy offers to read. When she is done, Mrs. Caster asks if the students have any questions or comments. Tico wonders if they have to attend tonight's parents' meeting, and Mrs. Caster assures him that they do not. The children fall silent again.

First Grade at Montford
Rapidly Improving School
Pupil-teacher ratio for this activity: 22:1
Class size: 27:2

In the first example, Mrs. Giles and Mrs. Martin each took a small group for instruction. Children were clearly engaged and had many opportunities to interact in very personal ways with language. In the second example, students in a group of 22 were more than passive; they were disengaged and almost resistant. Mrs. Caster spent as much time on management as she did on literacy instruction, and she seemed to be the only person participating in the activity.

The teachers in the first example were using the resource of CSR by forming smaller groups for instruction so that children had more opportunities to interact with content, the teacher, and each other. The teachers in the second example did not work in a reduced class size context—they were tag-team teaching. In our many observations at Montford, we saw consistent, authentic coteaching in the kindergarten classroom. Although the first- and second-grade teachers divided their group for guided reading each morning, all other instruction was tag teamed. We found this to be a common theme across all sites that used 30:2 configurations, and we became interested in understanding its prevalence.

As we observed in these classrooms throughout the year, we were reminded of the sheer volume of work that teachers do each day. We noticed the intensification that the teachers faced as a result of working with high densities of students living in poverty, an increased responsibility to communicate with parents and families, expectations that they work collaboratively in teams, and the ongoing pressure to improve standardized test scores.[2] Adding to this, many of the teachers were attempting to implement "best-practice" methods for teaching literacy in their classrooms. This carries the expectation that teachers engage in practices such as creating multilevel, multigenre classroom libraries, maintaining word walls, and implementing guided reading into their curriculum. The intensification of the teachers' responsibilities influenced their chosen methods for instruction as well as the ways they used the resource of having two teachers in the classroom. The only way, it seemed, that a teacher could possibly accomplish all of these best-practice methods was to become two teachers.

Mrs. Turnquist, a 30:2 kindergarten teacher at Earhart, confirmed this as she explained how she and her partner shared the workload:

> I loved team teaching because it's nice to have another adult in the room and you don't have to be responsible for everything. You have someone else to share that responsibility. If you have any type of behavior problem, it's really nice to feel that you have someone else on your side. And you have someone else to help with the rest of the group if you have to do something with one individual child. . . . I think you learn so many things from another person. . . . You can share the literacy lessons, the math lessons, the science, everything else, and that's kind of a neat thing to be able to do at the elementary level, because we have so much planning and so much prep.

Tag-team teaching allowed these teachers to reduce the amount of planning they each had to do as well as the amount of face time they had with their students. This was not laziness. Tag-team teaching was a coping strategy that the teachers employed to resist the intensification of their jobs. Just as a wrestler "tags" his partner when he needs a break from the ring, these teachers relied on one another to meet the challenges of teaching.

Of the nine team-taught and one SAGE block classrooms, only Mrs. Martin and Mrs. Giles consistently divided the students into smaller groups and did true coteaching. In the other situations, the teachers either tag-team taught, or they worked as a leader and aide. Mary Durst, the principal at Montford, recognized this tendency to drift toward tag-team teaching and the implications for CSR:

> One of my main concerns is even with two teachers in the room, when you get above 25, it's too many little bodies. Our teachers work well together and they team teach, but there is still time when one teacher's leading and the other teacher is kind of roaming. When that happens you have a 1:25 ratio, really, you're not splitting that class up. I think, whether it was SAGE or whatever the philosophy, small classes make a huge impact on learning. So two teachers or not, if we can keep those classrooms smaller, that would be the ideal.

This lack of small-group instruction in two teacher classrooms was especially interesting given that these classrooms had very few additional adults available—few parent volunteers, student teachers, special education and reading teachers, or paraprofessionals for additional support.

Fragility of teams. Another issue that reinforced tag-team teaching was the fragility of the team relationship: Teachers and principals thought that only some collaborations were possible. Mrs. Alcott and Mrs. Turnquist were convinced that their partnership worked because they were compatible philosophically and already had a foundation of friendship. Mr. McMullen,

a first-grade teacher at Bethany, noted that new hires were made with a specific teaching partner in mind. This represented what he thought was quality leadership: "I think it was a smart thing to do from his perspective as the leader of the school to get two people that can work together and also the work that our kids put out shows it." His teaching partner, Mrs. Feller, noted that partners do not need to be clones, they just need to be on the same page. She saw it as a matter of community building.

In fact, some collaborations do not work. At Wellstone Blvd., a low-achieving school, two kindergarten teachers were paired in a 30:2 teaching configuration. The partnership was rocky from the start, and by December, one of the teachers asked the principal if she could move her students into an empty classroom used to store extra desks. Despite continued pleas, which included moving everything herself, the principal denied her request. His reasoning was that if he allowed one team to split, then he would have to do it for all of the teams. The teacher finally took a sabbatical beginning in January rather than continue in a nonproductive and very stressful teaching relationship. The children then had a series of substitute teachers assigned to fill her position.

At Calloway Elementary, Ms. Collier, the principal, used a structural approach to solve partner problems—she reassigned teachers to new solo spaces:

> If teachers wanted to work together then we would make it happen, but if they didn't want to work together, then I tried to get rooms for them to work. We had a couple of teams that weren't working well, and so I took away the classroom for the music teacher and I took away the art teacher's classroom. The music teacher, we made sure her days are opposite the gym teacher's days, and the music teacher works in the gym and then the art teacher just has to be on a cart and go from room to room, because the bottom line is what's in the best interest of these kids and we don't have time to work out the personality conflicts with the adults.

This kind of solution was possible because this school had declining enrollments and there was available space into which they could move.

Supporting Teachers to Implement SAGE Programs

Despite the provision in the SAGE law for professional development, few of our participants could identify professional development experiences directly related to teaching smaller classes. Professional development initiatives focused instead on best practices through balanced literacy, visits to other schools engaged in high-quality teaching, and work in professional learning communities. All of these schools had worked recently to align their instructional practices with a certain model; in some schools, it was balanced literacy, and in others, it was direct instruction. Targeting professional development at teaching practices in literacy was a theme shared across schools.

There was also a trend toward providing time for staff to work together for planning and collaboration rather than relying on outside consultants to educate. Regardless of the focus, however, the assumption seemed to be that teachers would automatically transfer the lessons learned in those types of experiences to the CSR context. Miss Sellers, a third-grade teacher at McMahon, noted the lack of specific attention to changes in pedagogy:

> We really did not get any training for SAGE. It was, we're going to be SAGE—oh, okay. That's about it. Nobody came in or we never really talked about what could we do differently now that we're SAGE. I guess I kept thinking we were going to get something from the state saying, "OK, guys, now you're SAGE, these are the things that you need to look at doing." And we didn't. It was just kind of "Here you are, you're SAGE."

Ms. Feller, a first-grade teacher at Bethany, noted that the lack of professional development was a lost opportunity:

> I think a lot of teachers don't realize what a goldmine it is to have such a low ratio, and I think if you're still teaching, you know, by the worksheet, by the book every day, you're not utilizing the great gift of having 15:1 or 30:2 that you could, to meet those kids on a individual basis.

Paula Walworth, the principal at Earhart, articulated why this was a problem—that positive student outcomes in CSR programs rely on good teaching:

> Small class size is still only as good as the teacher teaching it. If you have a weak teacher with 15, then with 12, they're still not doing a great job. If you have a great teacher with 30, they're still doing an awesome job; they're just going to do twice as well maybe with 15. So I would put that emphasis out there and out more there publicly. I say not only does it value programming for kids, but it really puts a different value on teachers. . . . The funding isn't to keep fewer kids together; it's to give us better teachers.

Teachers had interesting ideas about how professional development might help them capitalize on SAGE. Marcia Delton, a third-grade teacher at Calloway Academy, suggested groups of SAGE teachers in particular configurations and particular grade levels supporting each other. Her idea was prominent among the teachers—they learned best when the development was directly related to their specific professional needs:

> I consider this professional development: a kind of consortium of teachers, of SAGE teachers, getting together, I don't know, once or twice or three or four times a year. To talk about what goes on in their SAGE room . . . I think teachers learn a lot more from each other than

> an expert. I think people tend to think people from some of those organizations that get up and kind of lecture really haven't been in a classroom recently enough to know the ins and outs and social ways of what kids are going through.

Paula Walworth thought that basic information about SAGE would provide a foundation for teachers to change practice:

> I think training, staff development: What is the SAGE program? What are its goals? What is its whole theory? So that there would be an awareness of what are the advantages we should expect by being a part of this program. As well as some staff development on given a smaller class, what is it we expect you to be doing because you've got fewer students? Some professional development that says, you have fewer numbers and the expectation is that you will have more communication with parents now.

Although some teachers felt that sharing by teachers would improve practice, and some principals thought more information would help increase understanding and therefore support change, a veteran district administrator pointed out that SAGE was one thread in a complex tapestry of school practice.

> We don't talk that much about SAGE itself. SAGE isn't a thing. SAGE is a funding source that helps to support where we want to go. So what we talk about is the achievement gap, and we talk about the logistics of how is it working and do you have enough classrooms and how are the teachers; we talk about those kinds of things, pulling the SAGE principals together. But we mostly talk about our commonalities of what we're going for here. (Penny Karson, curriculum coordinator, Bellamy School District)

If a program such as SAGE is seen as a funding stream rather than a teaching practice, it is little surprise that it was not framed as a major instructional initiative. Its place as a component of an overall educational design makes much sense.

Discussion

As the literature on CSR has matured, it has helped us see the complexity of implementing a policy purported to increase student achievement by strengthening student–teacher interaction. Because CSR is implemented in the multifaceted system of classroom practice, it is supported and constrained by the forces at play in the day-to-day life of the elementary school. The specific example of SAGE implementation shows how the resources provided by the SAGE program financed additional staff but came up against the limited space of the school building, requiring innovative reallocation of

space and staffing. In contexts with adequate space, teachers had the opportunity to use it to structure instruction of many different kinds, including large-group lessons, small-group pull-out sessions, and individual activities that were either teacher or student directed. In space-constrained contexts, teachers struggled to do the kind of teaching they knew was appropriate with young students and were forced to give up many of the hands-on or small-group activities supported by volunteers. Responding to the ever-increasing intensification of their work, teachers placed in teaching teams overwhelmingly resorted to tag-team teaching. This model had one teacher managing instruction while the other teacher did administrative work. This strategy resulted in an effective increase in class size for the students involved. This one-teacher/one-class approach reflected the egg-crate culture of U.S. schools.

In our year of observing SAGE classrooms and talking with teachers and principals, we saw many teachers capitalize on the tremendous investment of SAGE through innovative teaching and collaboration. Given the complexity of their students' lives, we do not think any of the participants would argue that teaching in a reduced-sized classroom was easier; instead, SAGE made a huge job more manageable. Rather than focusing solely on the face-to-face instructional tasks, teachers were frequently pulled to the other, related aspects of teaching: communicating with parents, institutional bookkeeping, classroom housekeeping—all the things that relentlessly fill teachers' days.

This can be seen in the following excerpt of an interview with Dena Felton, a second-grade teacher at Montford:

> You have 25 kids with lives and the things that they want to share with you and issues and it's so much easier to have two of us, you know. . . . One of us is doing the morning activities with them, the other one can be calling home if something happened to the folder; if we need to talk to someone, you know we can do that. Or if the parent stops in, one of us can continue teaching, while the other one is talking with the parents. . . . I really think how we do it just is beneficial for our students, where one of us leads the entire unit and the other one is either pulling up a small group of students that didn't meet the last goal or working one-on-one with some of the kids that aren't getting what we're doing.

Teachers favor SAGE because it allows them to do the kinds of things that they believe are best for children. It allows them to differentiate instruction in reading and other content areas. It allows them to communicate with students daily through home and back folders and through on-the-spot conversation. It allows them to work one-on-one with children. It allows them "backup" for management and behavior issues. Although they may not always take advantage of these things, there is a space for them to do so. The error is in assuming that teachers can navigate that space without any guidance. It is equally erroneous to throw two teachers together and expect

them to work in tandem without any specific training for how to achieve this. This type of "contrived collegiality"[3] may result in teachers' adopting models of team teaching (such as tag teaming) that do not exploit having two teachers in the classroom. Often, because team teaching is imposed on teachers, their task purpose is foreign and lacks the internal persuasiveness of relationships chosen on their own. The lack of coteaching, particularly in contexts in which little effort was put into professional development to catalyze it, should come as no surprise.

There is specificity in the practice of teaching smaller classes that goes against the grain of the tradition of 20 to 25 students and one teacher, a tradition forged through decades of experience. Whether CSR results in a smaller group or a team-teaching situation, it appears that teachers could benefit from specific support so that they do not bring the same old tools to a new context.

Although SAGE can make teachers' lives more manageable, it complicates them as well. Teachers in SAGE classrooms must learn to change their practice, to (in team situations) work side by side with another teacher, to navigate new classroom spaces, to incorporate challenging curriculum, to recognize the numerous levels of ability within their group of children, and to teach those children at the appropriate level. Teachers in SAGE classrooms must demonstrate that they have met a variety of goals. With SAGE comes a host of challenges that teachers in traditional classrooms do not necessarily face. The teachers with whom we worked showed overwhelmingly their willingness to meet these challenges. They just did not always have the tools for doing it. It became clear to us early in the project that teachers wanted resources for improving their practice. Several asked about professional development opportunities that focused specifically on teaching in SAGE classrooms, and several noted they had never thought of the kinds of changes in teaching a smaller class might allow until we asked them about it.

This research provides a bird's-eye view of a policy to show how SAGE was implemented in local contexts. The purpose of our work is to serve as a tool for teachers and administrators as they face the challenges of implementing and maintaining this instructional initiative. More than anything, this research has reinforced for us the very important idea that teacher action is connected to a myriad of other factors that shape what is possible. Teaching in SAGE classrooms was shaped by persistent physical realities of space, administrative staffing decisions, teacher willingness to collaborate through coteaching, the conditions of intensification in teaching, and lack of CSR-specific professional development. CSR, in the case of SAGE, is not a single policy variable but a cog in the larger machine of schooling. If the larger machine doesn't change, the cog is inconsequential.

Future research on CSR initiatives can add to our understanding by expanding this contextually oriented approach by linking teaching and learning to other elements of life in schools. One way to think about CSR is to frame it as a program that builds instructional capacity (Cohen, Raudenbush,

& Ball, 2000). How does reducing class size enhance the ability to deliver high-quality instruction to all children? Building on the work to date, a first step would be to more clearly examine instructional activities. We have much to learn about the particular strategies that are most effective with smaller groups and in coteaching situations. In a slightly different vein, this project showed the utility of mapping administrative decision making in allocating resources for CSR, but there is still much to learn, particularly linking school, district, and state leaders. We have not heard the final answer on the question of student outcomes produced by being in a smaller class. No one study will answer all the questions, so we must continue to design and carry out research from a variety of perspectives and using a variety of methods.

SAGE in particular, and CSR in general, allows teachers the space to create meaningful learning opportunities for students. Giving teachers support to develop new strategies for teaching smaller groups makes it more likely. The presumption that change will naturally occur in teacher practice was not borne out in our observations and interviews. It would be a shame to reduce the power of this reform by not helping teachers and administrators to develop new practices matched to smaller groups. This is a step toward different kinds of teaching, one that requires guidance, reflection, and innovation.

APPENDIX
Interview Information

Interviews with teachers took place in the fall and in the spring, typically in classrooms during noninstructional time. Interview duration ranged from 40 to 90 minutes. Teacher interviews focused the local teaching context and how Student Achievement Guarantee in Education (SAGE) affected teaching in terms of resources such as space, equipment, materials, instructional strategies, assessment, collaboration, and relationships with families. Examples of questions asked were the following:

- The SAGE program provides a number of resources to schools. How has participating in SAGE affected your teaching?
- With smaller classes, there are more classrooms. What challenges has this presented to your school in terms of space, materials, equipment, etc?
- Beyond having fewer children to assess, how has SAGE changed your assessment practices?
- What would be important for me to know to really understand what it's like to teach in this SAGE school?
- Some people suggest that class-size reduction requires a different kind of teaching. Could you describe how that might or might not be true?
- How has this year's group made you think about that?

We interviewed principals in the fall, midyear, and at the end of the school year in administrative offices or at home, in one case. These interviews lasted 45 to 120 minutes. We asked principals to describe their local leadership context and how they implemented SAGE in their school, again focusing on

resource allocation and instructional leadership. Examples of questions included the following:

- How have you managed space as you've implemented SAGE?
- SAGE has four distinct elements. Could you tell me how your school enacted each of these elements this year?
- How would you evaluate the success of these efforts?
- What kinds of supports have you had from the state and from the district for SAGE?
- What goals do you have related to SAGE?
- How are these goals created? Evaluated?

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[1]All names for districts, schools, and participants are pseudonyms.

[2]Michael Apple describes the many symptoms of teacher intensification, ranging from being allowed no time at all to even go to the bathroom, have a cup of coffee, or relax to having a total absence of time to keep up with one's field (Apple, 1995).

[3]In conditions of contrived collegiality, teachers are thrown together for administratively determined purposes rather than for more organic, spontaneous, teacher-chosen tasks (Hargreaves, 1992).

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