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Class Size Reduction: A Facilitator of Instructional Program Coherence

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Class Size Reduction: A Facilitator of Instructional Program Coherence

by
Derick M. Kiger⁺

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Abstract

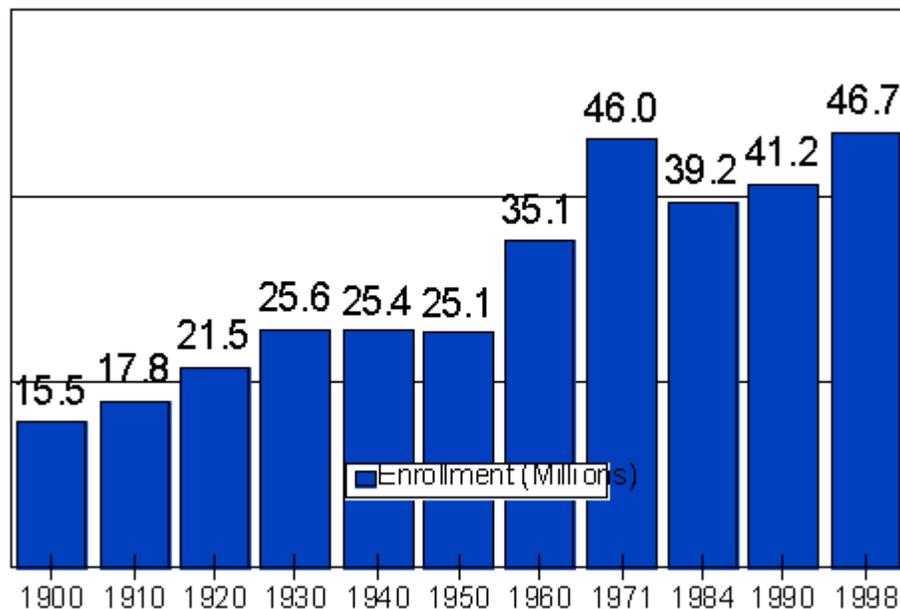
This case study evaluation explored how class size reduction (CSR) combined with other reform initiatives and contextual factors to affect student achievement. The evaluand was an elementary school that implemented Wisconsin's fortified CSR program named SAGE. Evidence was collected from existing records and purposively selected teachers via a focus group. A three-phase "cut and paste" analysis strategy was used to reduce data, display data, and draw and verify conclusions. Main and interaction effects are reported. Findings suggest smaller classes may affect student achievement by facilitating the coherence of school-level instructional programs.

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Introduction

Class size reduction (CSR) is viewed as a key reform strategy to improve the perceived achievement deficits in U. S. public schools. Several factors have stimulated the interest in smaller classes including increasing enrollments, a perceived achievement crisis, and a quest for programming to reduce educational inequities among advantaged and disadvantaged students. Post-WWII efforts to make public education more accessible combined with the "baby boom" population explosion to increase enrollments in U.S. public schools. According to the National Center for Education Statistics ([1999](#)), enrollment increased from 25.1 million in 1950 to 46.7 million in 1998. It is during this enrollment growth period that educational researchers focused their collective attention on the relationship between class size and achievement (Mitchell & Beach, [1990](#)). [Figure 1](#) shows the 20th-century enrollment patterns for public elementary and secondary schools in the United States.

Figure 1.
20th-century enrollment patterns for U.S. public elementary and secondary schools.



The "echo" of the baby boom promises to sustain experimentation with class size reduction. According to a special report issued by the U.S. Department of Education (1999, August 19), the public and private school enrollments are projected to increase each school year from 1999 to 2006. The number of births is also expected to increase slightly during the first part of the 21st century.

Many stakeholders of U.S. public schools have perceived a prolonged crisis in student achievement. The crisis has roots in the 1980s when politicians used declining domestic test scores and poor performance on international achievement tests to promote reform agendas (Berliner & Biddle, 1995). Business and industry contributed to the perceived crisis by claiming graduates of public schools were ill prepared for the emerging high-tech work force. Crisis response has embodied many educational reforms including school choice, continuous school improvement, standards-based accountability, and class size reduction.

Besides record enrollments and the achievement crisis, the quest for educational equity stimulated interest in targeted interventions. The gap between advantaged and disadvantaged students widened during a transitioning post-WWII economy (Mirel & Angus, 1994). Economic disparity coupled with sobering descriptions of failing and deteriorating schools motivated stakeholders' demands for equitable access to educational resources and opportunity. Class size reduction was implicated as an equity lever in an interview excerpt from Jonathan Kozol's book *Savage Inequalities* (1991):

Some experts, I observe, believe that class size isn't a real issue. He [the principal to whom Kozol is speaking] dismisses this abruptly. It doesn't take a genius to discover that you learn more in a smaller class. I have to bus some 60 kindergarten children elsewhere, since I have no space for them. When they return next year, where do I put them? I can't set up a computer lab. I

have no room. I had to put a class into the library. I have no librarian. There are two gymnasiums upstairs but they cannot be used for sports. We hold more classes there. It's unfair to measure us against the suburbs. They have 17 to 20 children in a class. Average class size in this school is 30. (p. 88)

In response to the emerging equity gap, the federal government instituted a series of legislation and programming to improve the educational resources and opportunities of disadvantaged student populations. The Elementary and Secondary Education Act ([1965](#)) authorized grants for elementary and secondary school programs for children of low-income families. Similarly, the Education for All Handicapped Children Act ([1975](#)) provided free and appropriate public education to all handicapped students and the Childhood Education and Development Act ([1989](#)) authorized the expansion of the Head Start preschool program for disadvantaged families.

The federal Class-Size Reduction Program ([1999](#)) divided 1.2 billion dollars among the states to improve achievement of economically disadvantaged schools. The federal government proposed an initial 21st-century CSR investment exceeding 20 million dollars to hire more teachers. The goal was to reduce the national average class size in grades 1, 2, and 3 to 18 students (Brewer, Krop, Gill, & Reichardt, [1999](#)).

Many states preceded the federal CSR initiative by committing significant resources to reduce class sizes. Indiana and Tennessee were forerunners in the development and use of smaller classes. During the decade of 1980, these states sought to affect student achievement by providing grants to reduce K-3 class size to 20 students or less in volunteer schools. California and Wisconsin followed suit in the 1990s by introducing early-grade CSR initiatives. Wisconsin's program named the Student Achievement Guarantee in Education (SAGE) linked class size reduction and other reforms to amplify the achievement benefits of smaller classes.

The CSR Achievement Impact

The CSR literature consists largely of evaluation findings from state-sponsored class-size reduction programs. These initiatives have generally reduced K-3 class sizes to 20 students or less. The evidence shows significant achievement effects that are most powerful for economically disadvantaged and minority students at kindergarten and grade 1 (Bohrnstedt & Stecher, [1999](#); Finn & Achilles, [1999](#); Molnar, Smith, Zahorik, Palmer, Halbach, & Ehrle, [1999](#)).

The initial CSR achievement benefits continue through middle school and high school according to some follow-up studies (Nye, Hedges & Konstantopoulos, [1999](#)). CSR students may be less likely to fail a grade level or be suspended compared with students attending regular-sized classes in grades K-3 (Pate-Bain, Boyd-Zaharias, Cain, Word, & Binkley, [1997](#)). Early-grade CSR may also result in a greater percent of students completing advanced course work in high school (Pate-Bain, Fulton, & Boyd-Zaharias, [1999](#)) and taking college-entrance exams (Krueger & Whitmore, [1999](#)).

Explanations of the CSR Achievement Impact

An emerging segment of research seeks to explain how CSR influences achievement. Several explanations have been provided (Anderson, [2000](#); Mitchell, Beach, & Badarak, [1989](#); Molnar, Smith, Zahorik, Halbach, Ehrle, Hoffman, & Cross, [2001](#); Pong & Pallas, [2001](#)). A common theme is that smaller classes affect student achievement indirectly by individualizing the teaching and learning process. Fewer students provide teachers an *opportunity* to deepen curriculum and increase coverage, and vary instructional and assessment practices. Teachers are also afforded an opportunity to know students better and attend to their needs more effectively.

Criticisms of CSR

Despite the enhanced teaching and learning opportunity created by reduced class size, researchers have not observed corresponding changes in the curriculum or instructional practices (Betts & Shkolnik, [1999](#); Holloway, [2002](#); Pong & Pallas, [2001](#); Stasz & Stecher, [2000](#); Varble, [1990](#)). Analysis of smaller classes has shown a focus on reading and basic skills and a reliance upon teacher-centered instructional techniques (Odden, [1990](#)). The viability of CSR has also been jeopardized by high programming and opportunity costs, limited classroom space, and a diminishing supply of qualified teachers (Brewer, Krop, Gill, & Reichardt, [1999](#); Hanushek, [1999](#); Hruz, [2000](#)).

Statement of the Problem

Much research has been conducted to detect and explain the CSR achievement impact. What is not well understood is how reduced class size combines with other reform initiatives and contextual factors to influence student achievement. A better understanding of these relationships could inform design, facilitate implementation, and strengthen achievement effects (Finn & Achilles, [1999](#); Mitchell & Mitchell, [1999](#); Nye, Hedges & Konstantopoulos, [1999](#)).

A significant portion of the CSR literature base originates from objectives- and management-oriented evaluations of state-sponsored class-size reduction programs. These approaches are useful for identifying needs, assessing effectiveness and producing evidence of program-specific outcomes but have limited utility for exploration and discovery. Individual schools that have reduced class sizes are natural and wealthy data sources that must be explored to deepen the literature base (Finn & Achilles, [1999](#); Harman, Egelson, & Achilles, [1997](#); Molnar, Smith, & Zahorik, [1998](#)).

Purpose Statement

The purpose of this case study evaluation was to explore how reduced class size combines with other reform initiatives and contextual factors to affect student achievement. The evaluand was an elementary school that implemented Wisconsin's fortified CSR program (class size reduction, education and human services, rigorous academic curriculum, & staff development and accountability) named SAGE. Each component was hypothesized to improve student achievement by affecting teacher-student interaction (Sapp, et al., [1996](#)). Interaction between CSR and other components was not hypothesized. The following terminology is used interchangeably throughout this paper: CSR, CSR programming, CSR initiatives.

SAGE

Wisconsin's Student Achievement Guarantee in Education (SAGE, [1995](#)) is a fortified CSR program with the aim of improving achievement of economically disadvantaged schools. Schools receive up to \$2,000 per low-income student in the eligible grades to pay the costs of the program. SAGE was initially implemented in 30 schools in 21 Wisconsin school districts in 1996-97. The number of participating schools expanded to 80 schools in 46 districts by 1998-99 (Bensen, [1999](#)).

The Wisconsin Legislature enacted the program into law based on the premise that CSR must be fortified with other interventions to elicit the greatest achievement impact. Participating schools implemented three program components besides reducing K-3 class sizes to 15 students over a period of three years. The supporting components included education and human services, rigorous academic curriculum, and staff development and accountability (Sapp, et al., [1996](#)).

Class Size Reduction

Each SAGE school was required to reduce regular education class size to 15 students or less at kindergarten through grade 3. According to program architects, reduced class size would be the most substantial program component because of its individualization of the instructional process. Teachers would have more time to "diagnose problems, select appropriate materials, target instructional practices, and evaluate progress" (Sapp et al., [1996](#), p. 2).

Education and Human Services

Each SAGE school was required to engage and collaborate with stakeholders to make a variety of services available before and after school. The education and human services component was included to "create and maintain an educational ethos in the classroom, school, home, and community in which learning is seen as a natural, lifelong, valued event" (Sapp et al., [1996](#), p. 2).

Rigorous Academic Curriculum

Each SAGE school was required to develop and provide a rigorous academic curriculum based on challenging standards. Regular curriculum review was required to identify adjustments needed to improve achievement. The function of the curriculum component was to focus the teaching and learning process on essential knowledge and skills (Sapp et al., [1996](#)).

Staff Development and Accountability

Each SAGE school was also required to implement a comprehensive staff development and accountability system. Elements of the system included new employee transition, planning and staff development time, and staff evaluation. The function of the component was to create a more reflective and skillful staff (Sapp et al., [1996](#)).

Case Study Evaluability

The evaluability of SAGE was high. Program requirements and activities were well defined. Schools were required to keep detailed records of program implementation and outcomes. District and school stakeholders were receptive and cooperative to program evaluation.

The researcher served as the district's Administrator for Research and Accountability from 1996 to 2000. The position was created to facilitate school improvement efforts through planning, evaluation, and testing. The researcher's primary responsibilities included administration of strategic and site planning, administration of the student assessment system, program evaluation, and school performance reporting.

Context

The evaluand is a south-central Wisconsin city school district with a resident population of approximately 35,000. The city's residents are racially and economically diverse, as approximately 30 percent are minority and economically disadvantaged. The city has experienced an increase in its Hispanic and bilingual population.

The city school district comprises 12 elementary schools, 2 middle schools, and 1 high school and serves approximately 6,775 students (School District, [1999a](#)). Approximately 62 percent of students are white, 28 percent African American, 9 percent Hispanic, and 1 percent Asian/Pacific Islander or Native American. Approximately 40 percent of all students qualify for free or reduced lunches per federal guidelines. Eighteen percent (18%) present special education needs. Student mobility approaches 40 percent at some elementary schools. The average number of elementary students per classroom teacher is 21.

The SAGE School

One of the district's elementary school's implemented and sustained SAGE from 1996 to 1999. The school facility was constructed in 1952 on 10 acres of land on the east side of the city and comprised 14 rooms, including a gym and library. School facilities were updated in 1962 to increase the number of classrooms to 20. The instructional capacity of the school is 334 students (School District, [1998a](#)). School enrollment was 284 students for the 1998-99 school year (School District, [1999a](#)).

The school staff comprises white female teachers (School District, [1999c](#)). The majority of teachers have at least 15 years of teaching experience. The school principal is a white male with 30 years of experience and was named the Wisconsin principal of the year in 1992. Approximately 28 percent of the student population is minority and 34 percent economically disadvantaged. Fifteen percent (15%) of students present special education needs. The average student-to-classroom instructor ratio is 17:1 while there are approximately 13 students per licensed instructor at the school.

Data Sources

Evidence was collected from existing records and purposively selected SAGE teachers via a focus group. Records are written or recorded statements prepared for attesting to an event or

providing an accounting (Lincoln & Guba, [1985](#)). Use of existing data is recommended because collection is usually cost-effective, existing data are not biased by the collection or analysis process, and abundances of "rich" data are usually collected but not sufficiently used (Worthen, Sanders, & Fitzpatrick, [1997](#)). Records are also valuable because they represent stable data, describe critical events, identify implementation problems and allow study of contextualized trends and sequences (Mahoney, [1997](#); Rossi, Freeman, & Lipsey, [1999](#)).

Focus Group

A focus group is a semi-structured method of group interviewing designed to yield contextually "rich" information about a topic in an efficient and quick manner (Sorensen, [1996](#); Worthen, Sanders, & Fitzpatrick, [1997](#)). Data elicited via focus groups are subject to several limitations. Generalizability is limited by nonprobability sampling techniques, the interdependent nature of the data, and possible bias introduced by a group facilitator. Other limitations include suppression of participant interaction by a dominant group member, lack of participant confidentiality, and potential difficulties of summarizing and interpreting qualitative data (Sorensen, [1996](#); Stewart & Shamdasani, [1998](#)).

Data Collection

Data from existing records (see [Table 1](#)) were collected and analyzed. The records were obtained from the district's SAGE school and administrative offices. The researcher determined the reliability and validity of the records by the indices of scope, completeness, and quality.

Table 1
Existing Records

Records	Origin	Description
Board of Education -Year End Report	District	Required by the school district. Describes the SAGE principal and school staff perceptions of SAGE components and impact.
Budget Hearing Presentation	District	Presentation to the Wisconsin legislature regarding the continuation of funding for the SAGE program. Describes the perceptions of SAGE staff about programming components and impact.
Site Development Plan	District	Required by the school district. The SAGE school's improvement plan.
Site Development Plan - Year End Report	District	Required by the school district. Describes the perceptions of SAGE staff about successes, progress, and concerns related to school goals.

SAGE - Year End Report	Wisconsin DPI	Required by the Wisconsin Department of Public Instruction (DPI). The Year-End Report requires each SAGE school to collect data about implementation of the SAGE components.
SAGE Contract	Wisconsin DPI	Required by the Wisconsin DPI. The school board of any school participating in the SAGE program must enter into a five-year achievement guarantee contract with the Wisconsin DPI. The contract specifies the eligibility criteria, SAGE requirements and establishes baseline data for the participating school.

Focus Group

Data were also elicited via a focus group interview. The researcher used purposive sampling to select a homogenous group of SAGE classroom teachers. This sampling technique was preferred to random sampling because it maximized the researcher's ability to identify emerging themes within the context of the evaluand (Erlandson, Harris, Skipper, & Allen, [1993](#)).

A written invitation explaining the purpose, format, time and location of the focus group was sent to SAGE classroom teachers (n=17). A consent form, participant information form, and a copy of the focus group questions was included with the invitation letter. The researcher followed the invitation with an e-mail to confirm participation.

A total of 7 teachers from kindergarten to grade 2 accepted the invitation. The average participant experience at the school was 12.14 years and the median was 10. The experience range was 20 years.

Informed consent was obtained from all participants before the focus group. The consent form was included with the invitation letter and explained the rights and obligations of persons agreeing to participate in the focus group. Most notably, that participation was voluntary, responses were tape-recorded and that confidentiality was assured.

Location, Date and Time. The focus group interview was conducted at the SAGE school from 3:30 p.m. to 5:30 p.m. to make participation convenient for teachers. A room suitable for a group gathering was used. Participants were seated around a table to preserve a sense of personal space and provide security for reserved members (Stewart & Shamdasani, [1990](#)). This arrangement was conducive to group interaction.

Facilitator. The focus group was led by the researcher, whose main task was to facilitate group discussion and interaction about the topic. The researcher introduced the purpose and topic of the focus group. Participants were also instructed about appropriate ways to respond and interact with others in the group. The researcher posed initial and follow-up questions to clarify and probe participant responses (Worthen, Sanders, & Fitzpatrick, [1997](#)). Care was taken not to direct, cue, judge, impose or otherwise limit the discussion.

Interview Guide. An interview guide comprising an introduction and several open-ended questions (see [Table 2](#)) was constructed by the researcher and used as an outline during the focus group (Stewart & Shamdasani, 1998). The guide also included probes like "Can you explain why?" or "Can you provide specific examples?" and a concluding statement giving participants an opportunity to make final comments.

Table 2
Interview Guide

Focus Group Questions	
1.	As you know, SAGE focuses on four components in the school (CSR, educational & human services, rigorous curriculum, and staff development & accountability). Which of these areas do you see as most important to improved student achievement and why?
2.	How did the supporting SAGE components interact with reduced class size to improve achievement?
3.	If you were given the chance to redesign the SAGE program, what would you do differently and why?
4.	What organizational structures, policies, or events at the district or school level positively affected the implementation of the SAGE program?
5.	What organizational structures, policies, or events at the district or school level negatively affected the implementation of the SAGE program?
6.	What changes occurred as a result of the SAGE program that you did not plan or expect?
7.	What influences do you think the SAGE program has had on your school in general and why?
8.	If you had to choose a SAGE program component as most significant, which one would you choose and why?

Tape Recording and Transcription. The focus group interview was tape recorded and transcribed so that the researcher did not have to rely upon extensive note taking and memory to fill in interview gaps. The transcription of the recording provided the raw data for analysis and established a permanent data record. Qualitative content analysis of the interview transcripts was used to describe, analyze and summarize emerging patterns in the data.

Data Analysis

Data analysis commenced with the collection of existing records and continued through the focus group interview. A three-phase "cut and paste" analysis strategy was used to reduce data, display

data, and draw and verify conclusions (Berkowitz, [1997](#)). Reduction required categorizing data and choosing which were to be emphasized, minimized or excluded based upon the purpose of the research. For example, the researcher read the program records and focus group transcript and "cut" the data that suggested how reduced class size combined with other SAGE components. The data chunk was "pasted" to an interaction category aptly named. Frequency and intensity of responses was noted to add weight to the analysis. The researcher also examined the nonreduced data for emergent categories. The data reduction process was repeated as necessary.

Limitations of this analysis technique include opportunity for subjectivity and bias introduced by a sole analyst (Stewart & Shamdasani, [1990](#)). A peer review was conducted by asking a colleague to analyze and compare data categories for congruency. Focus group member checks were also conducted to guard against subjectivity and bias.

Once the data were reduced and categorized, a scheme for organizing and displaying the data was constructed (Berkowitz, [1997](#)). Data displays (see [Table 3](#) for example) facilitated the identification and interpretation of interrelationships, interactions, patterns, and emerging themes by showing responses by data category. The data displays also facilitated conclusion-drawing. Another approach displayed the data via flowcharts, allowing the researcher to identify emerging themes and interrelationships.

Table 3
Example of a Data Display

How the CSR component affects achievement:

How	Data Source	Data
Extra Time	Board of Education -Year End Report (1999)	The extra time generated by the reduced number of students has allowed the children to develop their language, vocabulary and problem-solving skills more fully.
Extra Time	Board of Education -Year End Report (1998)	...increased opportunity for language development, problem-solving and creative grouping afforded by the extra time generated as a result of smaller numbers.
Classroom Climate	Board of Education -Year End Report (1998)	Classroom climate has noticeably improved. There are fewer behavior problems.

The final phase of data analysis was conclusion-drawing and verification (Berkowitz, [1997](#)). Conclusion-drawing involved making meaning of the reduced and displayed data. This required the researcher to examine the emergent themes, relationships, and patterns in relation to research questions and contextual setting. The researcher asked questions like "What patterns and

common themes emerge in responses dealing with specific items?" to facilitate this analysis phase (Mahoney, [1997](#)).

Verification required the researcher to establish the validity of the conclusions by presenting evidence of trustworthiness. According to Erlandson, Harris, Skipper, and Allen ([1993](#)), trustworthiness is established via techniques "that provide truth value through credibility, applicability through transferability, consistency through dependability, and neutrality through confirmability" (p.132).

Credibility is equivalent to internal validity and was established through triangulation and member checks. Triangulation allows for cross-referencing of data from different sources. Member checking allows focus group participants and other stakeholders to test data categories, interpretations, and conclusions, and is considered most crucial for establishing credibility (Guba & Lincoln, [1989](#)). For example, the researcher summarized the data and allowed participants to make corrections or challenges at the conclusion of the focus group. The researcher also furnished participants the focus group transcription and asked for clarification, confirmation, and other feedback.

Transferability is equivalent to external validity and was established via description of the context and sampling technique. Case study evaluation and purposive sampling limits generalizability. Transfer of findings beyond the bounds of the evaluand may be possible if the "applier" determines a salient overlap based on sufficient description of the context and accumulation of empirical evidence (Lincoln & Guba, [1985](#)).

Dependability is equivalent to reliability and confirmability is equivalent to objectivity (Erlandson, Harris, Skipper, & Allen, [1993](#)). For this study, each was established by providing a verifiable trail of procedures and data. An audit trail provides evidence of the raw data, data collection, data analysis, data interpretation methods used in the study (Lincoln & Guba, [1985](#)). An auditor could detect and confirm the trustworthiness of a study by examining the evidential trail.

Results

Results confirmed and extended the main effects of SAGE components. In addition, symbiosis among components was discovered. The interaction between CSR, other SAGE components, and contextual factors are depicted (see [Figure 2](#)) and described in the next sections.

1. Context - "Program-Friendly Environment"

The relationship between CSR, other reform initiatives, and contextual factors have received limited attention because of the practicalities associated with reducing class size (Finn & Achilles, [1999](#)). Exploration of the evaluand's context revealed several facilitating and impeding factors. On balance, the positive effects outweighed the negative influences to produce a more conducive or "program-friendly" environment for the implementation of SAGE. Table 4 presents the facilitating factors.

Figure 2.
The combination of SAGE components and contextual factors.

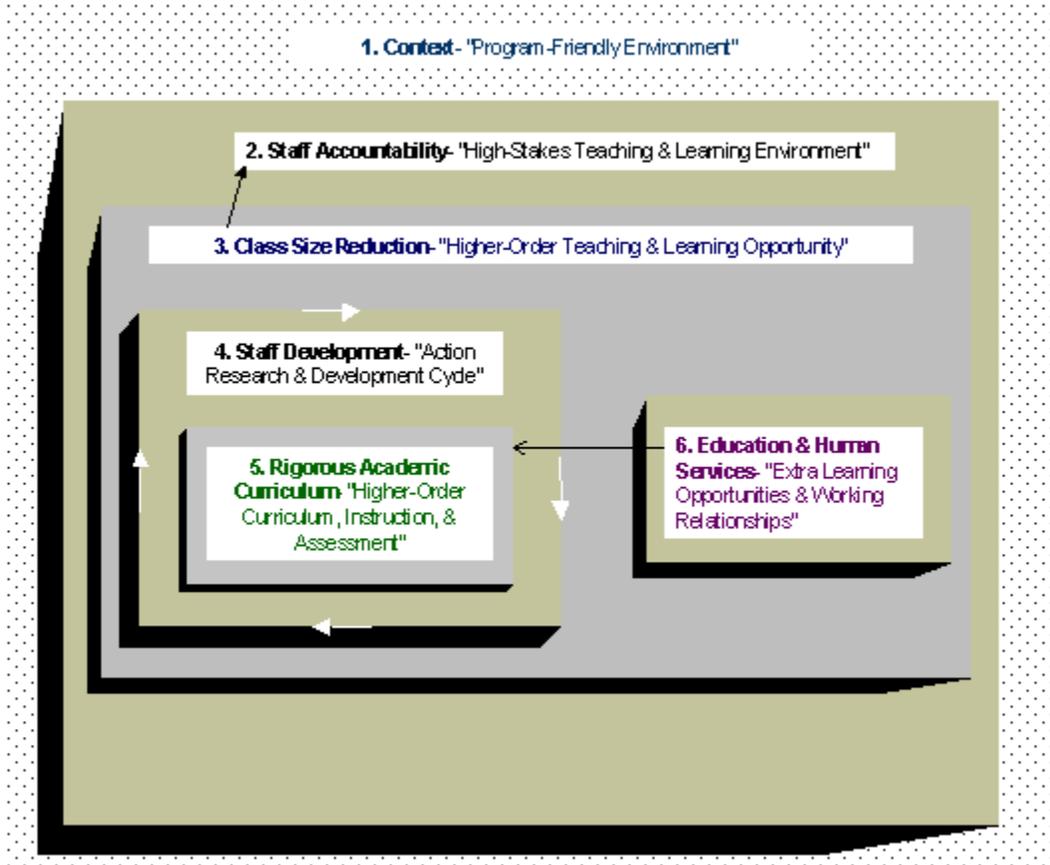


Table 4
Facilitating Factors

Beyond the School	
	Board of Education
1.	Established a Network of Filling Station Schools
2.	Accommodated Transfer of Staff and Students
3.	Supported Integrated Planning and Implementation
4.	Paid Extra Costs

	Central Office
5.	Supported Curriculum Development
6.	Supported Student Assessment and Program Evaluation
7.	Assisted Accountability Reporting
	Flexible Organizational and Policy Structures
8.	Site-Based Management
9.	Policy Waivers
10.	Site Planning Process
11.	Village-Partnership Process
	Within the School
12.	TRIBES Process
13.	HOSTS Mentoring
14.	Teacher Assistants/Aides
15.	Full-Day Kindergarten
16.	Leadership, Advocacy, and Accountability

Facilitators Beyond the School

Facilitators beyond the school grouped in three categories: Board of Education (BOE), central office, and flexible organizational and policy structures. The BOE supported SAGE beyond its "contractual" obligations. Existing district structures such as the "village partnership" decision-making process facilitated program implementation and development. The district's central office provided and sustained support for curriculum, assessment, and evaluation.

Board of Education Support. The BOE absorbed program expenses exceeding SAGE revenues. This included monies for additional classroom teachers, teacher assistants, curriculum development, curriculum and assessment materials, professional specialist time, and substitute teacher costs. The BOE also paid for early release busing routes on SAGE-specific staff development days and waived fees for community use of the school facility. As stated in program records:

The Board of Education has waived the fee for any community group wishing to use the school as a meeting place, or to use the gym for recreation. (Wisconsin Department of Public Instruction, [1997](#), p. 3)

As stated in the focus group transcript:

I think the district was quite supportive of it in the beginning and I think the school board; there were members that were quite supportive of it. (line 815)

The BOE also accommodated transfer of staff and students. Pre-SAGE staff was given the opportunity to transfer to another school once the school's site council decided to implement the program. A network of "filling station" schools was created to accommodate student overflows generated by class-size caps. As stated in program records:

Additional staff will be hired and employed at other schools to accommodate movement of students out of SAGE. (Wisconsin Department of Public Instruction, [1996](#), p. 2)

As stated in the focus group transcript:

In a big district the money pretty much took care of filling stations where kids went like ours. You had that other ten kids in the classroom that had to go somewhere. And pretty much we chose to build stations. (line 636)

The BOE supported integrated planning and implementation of SAGE. The strategy allowed grade-level staff not yet phased into the program to participate in planning, increase the section of classes, and experiment with class configurations. Implementation "bugs" were worked out of the classroom before that teacher's year of accountability took effect. As stated in the focus group transcript:

But the pattern after that first year was that the class that would come on the next year got to participate with the ones who were already in the program. So the first year the second grade got to participate in the planning and discussion and all of that right along with K-1 even though we weren't being held accountable to SAGE that first year. And then the second year we were being held accountable but the third grade got to do the same thing. So you had a year. You got in on the discussion and you got to think about the philosophy and see what all the pieces were going to be and how they were falling together. But then you got that year then to work out your own thinking system about how you were going to feed your grade second and third into that. And we've all thought that was a really helpful thing. We were able to think through and work out some bugs without the pressure. The district didn't have to let us do that. Because they also let us maintain three classrooms for that year even though in one case the numbers were a little squeaky to do that. But they let us maintain the structure physically that we were going to have to do later. And have that person already there and in place. So that we could plan together and do that growing together before our year of accountability began. (line 792)

Central Office Support. Central office resources were made available to aid the development, implementation, and evaluation of the program. A curriculum specialist facilitated the

development, refinement, and integration of the rigorous academic curriculum component. The specialist structured staff development work, focused and asked clarifying questions during activities, and played devil's advocate when necessary. The specialist also reviewed curriculum work, asked additional clarifying questions and made suggestions for improvement. The specialist made contributions to annual SAGE accountability reports to the BOE. As stated in the focus group transcript:

She [curriculum specialist] came in and facilitated that summer session to help us stay organized 'cause we worked in small grade groups. She set a direction for us and then she'd go back and forth between the groups trying to begin to seam it together and then after that was done then she kind of played devil's advocate with us. And say, have you thought this? What about that? Do you want to do anything about this or that? And read everything. So she put carrots out in front of us and see if we'll follow. Or what we want to do about it. She pulled our knowledge out of us instead of coming in and saying this is what it is. What does average kindergartner look like? What does a top of the line kindergartner look like? What does a below par kindergartner look like? What can they do? What can they do in math? What shapes do they know? We got real specific at each grade level, this is what we consider at this level for this grade to be able to do. And then we designed the instrument around it. It was great. Because it was valid. It was great that the district paid her to do that because she was like our voice of reason and our objective person. When we would all get kind of bent out of shape, and get caught up in this or that she could she could be the step back person and take a look. Every time our paradigm shift fell through the floor she would get it back up and going again. (line 764)

The SAGE school also used central office assessment and evaluation resources (Wisconsin Department of Public Instruction, [1999](#)). Support was provided to help manage testing, develop classroom assessment instruments, construct assessment data bases, and report assessment data. The assessment and evaluation support was also elicited for accountability reports to the Board of Education.

Flexible Organizational and Policy Structures. Existing district structures met several SAGE contract requirements (Wisconsin Department of Public Instruction, [1996](#)). These structures included the district's staff evaluation system, its staff mentor-mentee program, its village partnership decision-making process, and its site-based management requirements. A waiver process from the local educational association agreement with the BOE provided the SAGE school flexibility to adjust its school-day schedule for additional staff development and planning times. It also expedited the contractual stipulations for transfer or dismissal of low-performing staff.

The district's strategic plan and school improvement planning process aided the SAGE program (Wisconsin Department of Public Instruction, [1999](#)). The district's strategic plan articulated goals and endorsed strategies similar to those required by the SAGE program. The district's site development process provided a cyclical self-study framework engaging multiple stakeholders in needs assessment and other data analysis for strategic improvement planning. The process was helpful for SAGE staff as they planned, evaluated, and reported program success.

Facilitators Within the School

Several school-level factors facilitated SAGE. Supporting programming was implemented to improve classroom climate and reading achievement of at-risk students. Teacher assistants supported the teaching and learning process and full-day kindergarten combined with fewer students to increase classroom learning time. A dynamic school principal championed the program, acquired needed resources, and set high expectations for staff and students. School staff assumed leadership roles in curriculum and assessment development and accepted an extra workload.

Supporting Programming. The implementation of programming in support of learning facilitated SAGE. TRIBES (Gibbs, [1995](#)) helped improve classroom management and climate by developing inclusion, influence and community among students. Students learned a set of collaborative skills, and four "tribal agreements" were honored by students and teachers throughout their time together. The agreements encompassed attentive listening, appreciations/no put downs, mutual respect and the right to pass. Over time, teachers transferred responsibility to the tribe so that members could work collaboratively to set achievement goals, monitor progress and solve problems. As stated in the focus group transcript:

We often talk about this school family. And I think our kids really feel part of a family in the classroom. Because they do have so much more time to speak out and feel more confident. And they have more confidence. Because of the small group. They know each other better. Yes they do. [In unison] Than just knowing you on the playground. They know each other as students as well as friends. I think it's kind of come hand in hand with SAGE. TRIBES came along kind of at the same time as SAGE. And that just fell right together very nicely. Talking about family and a small group. And all the staff was trained in TRIBES right around the same time they were going through SAGE. So, that fit in very nicely. As far as feeling a part of something. (line 423)

The SAGE school introduced the Helping One Student To Succeed (HOSTS) tutoring program to affect reading achievement and the social and emotional growth of its at-risk students. HOSTS (Gibbons, [1971](#)) establishes a one to one relationship between a student and a volunteer adult from the community. The volunteer aspect of HOSTS also helped the school meet contract requirements of the education and human services component of SAGE. Peer tutoring within and across grade levels was also used to support learning. As stated in program records:

The HOSTS Mentoring Program, providing Reading/Language Arts assistance for gr. 2-5 at-risk students. (School District, [1999d](#), p. 1)

Peer tutoring was used in same grade classrooms and cross-grade levels at some point for all grades. (School District, [1999d](#), p. 6)

Classroom Support. Teaching assistants and student teachers were available to support classroom learning. The assistants were used in support of small group work, student computer use, and administration and scoring of classroom assessments. The assistants also helped in the preparation of reports cards that described and depicted student learning over a school year on specific content standards. As stated in program records and the focus group transcript:

Student teachers. (School District, [1996](#), p.1)

Having 15 kids is wonderful, but having a teaching assistant that took kids in small groups and really spent time with your lower level kids to bring them up. (line 677)

The reality is without them there our curriculum would be just a little less rigorous. We've made use of that in terms of bumping up the rigor. (line 695)

Full-Day Kindergarten. The school transitioned to full-day kindergarten with the implementation of SAGE. This structure combined with the smaller class size to dramatically increase the time and attention devoted to student learning at this grade level. The benefits broadened the scope of learning by providing more time for character education, experiences with computers and instruction in art, music and physical education. There was also more social interaction between students and more time to involve parents in the learning process. This improved student readiness to learn at grade 1. As stated in program records:

The full-day component of our SAGE program has benefited our students in a variety of ways...more time for academic achievement and enrichment, increased opportunities for class trips into the community, more experiences with computer technology and exposure to art, music and P.E. by our district specialist staff. We have also been able to do cross-grade curricular pairing and to more fully involve parents in the student day. We feel that the full-day program has allowed more time for the district goal of Character Education due to increased time for social interaction. (School District, [1997a](#), p. 1)

As stated in the focus group transcript:

Um, we notice that going to the full-day kindergarten at the same time, as we went to the 15, we just had hours of time left over that we could do other stuff. (line 77)

Leadership, Advocacy, and Accountability. School principal leadership was an important factor in program implementation and success. The principal organized, led, and sustained efforts for SAGE stakeholders. For example, the principal engaged in "professional battle" and won extra staff development days for SAGE planning and development. The principal also expected a "best effort" and commitment to excellence from all stakeholders. The school staff comprised professional educators who voluntarily assumed leadership roles in curriculum and assessment development, took professional risks, and accepted an extra workload to improve student achievement. As stated in program records and the focus group transcript:

Diversity and expertise of staff. (School District, [1997b](#), p.1)

We probably would have never had all of the benefits of SAGE without our principal. He steps out and gets all the things we need. For example, even our staff development days each year that we have throughout the year for our grades, I think he works really hard to go to bat for us. To keep our SAGE program going. I'm sure he has to do battle to get that. It's not just a given. (line 807)

I feel our principal above all has children he's interested in and that's his high priority. We do realize that this is his goal. And he's very organized about it. And when there's some rumbling, it's more about his way is very different from the way that we would go about doing it. Not that we disagree that he isn't doing it for kids or for the right reasons. It's just that the way he would

like to have it done or see it done is just very different from the way we think is practical sometimes to do it. But we seem to do it and it usually works out well. (line 1,153)

Impediments Beyond the School

Identification of contextual impediments is crucial as more schools invest limited resources to reduce class sizes (Finn & Achilles, [1999](#)). Class size drift, limited classroom space, inexperienced or unqualified teachers, misinterpretation of small class size effects, and high costs have affected the success of CSR initiatives (Biddle & Berliner, [2002](#); McRobbie, [1997](#)). [Table 5](#) shows the impediments for the evaluand.

Table 5
Impeding Factors

Impediments	
	Beyond the School
1.	Deteriorating Financial Capacity to Support "Above and Beyond" Costs
2.	Adversarial Relationship with NonSAGE Stakeholders
3.	Unrealistic Performance Expectations
4.	Perceptions of Resource Inequities and Favoritism
	Within the School
5.	Limited Space for Self-contained Classrooms
6.	Noninstructional Roles and Responsibilities of Teachers
7.	Limited Support Systems for Student Learning
8.	Limited Support for Special Education Students Transitioning to NonSAGE Grade Levels

Deteriorating Financial Capacity. The district was forced to reduce its operating budget because of declining enrollment and state revenue caps. Over time, budget constraints limited support for teaching assistants and curriculum resources needed for the rigorous academic curriculum component. As stated in the focus group transcript:

The budget is always a barrier. Sort of a visionary barrier. Once you start on a course of rigorous curriculum and different teaching methods and using different resources there's always going to have to be new things happening. And complementing what we've brought in. (line 886)

And when we first agreed to SAGE we were kind of sold to us on all this money we'd have for software and budget material and as it turned out that material was used to buy another teacher at another building to get her to 15 to 1. But what we thought we were going to get was you know, all new materials to enhance the teaching. (line 896)

Well one thing we haven't talked about is when we first started with SAGE we were able to keep more teaching assistants. And in some aspects we went backwards and had less teaching assistant time. At first we had a teaching assistant a half a day apiece and now we're down to an hour a day. (line 674)

Adversarial Relationship with NonSAGE Stakeholders. An adversarial relationship developed between some Board of Education (BOE) members and SAGE staff. The "us against them" relationship was fueled by unrealistic performance expectations and accusations of resource inequities from stakeholders of NonSAGE schools. Some BOE members expected a quick transformation of all students into high achievers and grew impatient when evidence (i.e., test scores) could not be presented. SAGE staff also believed BOE members weighted performance on year-end testing more than ipsative improvement across achievement measures and grade levels in judgements of program impact. As stated in the focus group transcript:

I tended to see SAGE as a program rather than an intervention. SAGE as an intervention takes on a different perspective in terms of progress and achievement. If you take it as a program then you have to come up with yes or no. Does it work? We can always show the progress that's being made. Do you want to look at it as a program period? You have to be at that 100%. That doesn't happen while you're growing. You can only show evidence of change and progress. (line 820)

...there's some kind of an expectation that SAGE is going to fix everything. And that if 100% of the kids are not achieving at 100%, 100% of the time than it's a failure. (line 911)

Too much emphasis on just numbers instead of on the individual successes. (line 918)

We felt listened to with this program so, the only place we don't feel that is sometimes when we present it to the Board. (line 1,037)

...we get slapped in the face because the number's not 100% of 100%. (line 948)

I don't think that we can be asked to raise the bar every year. Because it's a new group of children every year. Those new 5-year-olds walk in every year. They've never heard of SAGE. We're starting fresh. There's no cumulative effect. (line 962)

The adversarial relationship was exacerbated by stakeholders of NonSAGE schools who also wanted resources to reduce class sizes. The sentiments of inequity and expense of reducing class sizes elsewhere in the district heightened the BOE demand for proof of a powerful impact on student achievement. A "prove it" or "you're out" attitude was created. As stated in the focus group transcript:

...the further we got into the program, the more the people weren't so convinced it was so wonderful just for our school. Why weren't all the other schools having it? (line 817)

The difference is that the district's not paying for P-5 [pre-school to grade 5 entitlement program]. They are paying for us to some degree. So, that seems to be the dividing factor. (line 832)

And I felt like at first our yearly meetings with the Board were very adverse at times. Were very adversarial [In unison]. I just felt like we were on the line. On trial and that. To be honest with you, they still are in some respects. It's just like you don't get to present what you know. It's like you have to be on the defensive. I don't feel like it's a supported effort. It's more like you against us. And you better prove you made it or you're out. And that was a very hard thing the first few years. (line 901)

Impediments Within the School

Several factors at the school level were identified as impediments. The number of self-contained classrooms was limited. Teachers were asked to assume many roles above and beyond classroom instruction. A great deal of time was devoted to programming not directed toward improving student achievement.

Impediments also included the absence of learning support systems for students. For example, tutoring services and mentorships were not offered for students struggling with math. Support for the learning needs of special education students transitioning to NonSAGE grade levels was also cited as an impeding factor. As stated in program records:

Space- LMC size and lack of classroom and storage space. (School District, [1996](#), p.2)

Teachers are expected to wear too many hats, academic as well as social. (School District, [1998c](#), p.2)

Too much time spent on unfunded mandatory programs and programs not directly related to student learning. (School District, [1996](#), p.2)

We did not have a HOSTS Mentoring intervention for the area of math for those at -risk students who needed it. (School District, [1999d](#), p. 2)

Being able to adequately assess, assist our L.D. population in order to meet the standard when they get to grade 4. (School District, [1998d](#), p. 1)

2. Staff Accountability: "High-Stakes Teaching and Learning Environment"

Although grouped together by SAGE architects, staff development and accountability emerged as distinct components for the evaluand. Accountability for student achievement generated a high-stakes teaching and learning environment in which all other program components were embedded. Staff voluntarily accepted heightened professional consequences for the opportunity to work in an "ideal" teaching and learning environment with the potential of returning high academic rewards.

The high-stakes environment resulted in greater program investment by stakeholders. The investment produced more teamwork, efficient use of classroom time, and ownership of teaching and learning outcomes. Teachers also used the accountability component to leverage parental support of learning. Parents were more willing to "go the extra mile" because teachers staked job security to the guarantee of student achievement. As stated in the focus group transcript:

I think the accountability issue when we started SAGE, people were a little afraid like, oh no, we are going to be fired if we can't, or if our kids' don't, you know...when you sign on to something and actually sign and say I guarantee that my children are going to be able to do this, this, and this it makes you really invest in that program. (line 194)

Because when we first did it we were just working with our grade group and then all of a sudden we just realized that this is a team thing. And then all of a sudden we started melting in like the kindergarten to the first grade and to the second grade and so on. (line 140)

A long time ago when there used to be that weekly packet to do at home. The kids were given something to do for a half an hour while the teachers sat and worked that stuff out. It's been along time since we've used that approach for anything. Because of that accountability, that we feel the need to make every minute count for something. (line 301)

Because we did sign on that dotted line, and parents know we did sign on that dotted line, I think that they're a little more willing to go with us and when we try new things. When we get tough about that standard that we have to make. 'Cause I think they feel we truly have something at stake. I think the mindset for the parents is that we have put ourselves on the line and so therefore we have a right to expect them to do the same. (line 324)

And they're more willing to go with us when we tell them this is what it takes to be up there. (line 334)

3. Class Size Reduction: "Higher-Order Teaching and Learning Opportunity"

The CSR component affected student achievement indirectly by creating a higher-order teaching and learning opportunity for participants. Smaller classes provided the extra classroom time and climate necessary to effectively implement and execute a higher-order curriculum. Teachers were able to individualize the teaching and learning process and elicit parental support of students' individualized learning styles and needs.

Extra Classroom Time

Extra time was the most frequently cited benefit of reduced class sizes. Teachers were afforded more classroom time to work with students. A SAGE teacher estimated that CSR increased individualized attention and intervention by as much as 36 hours per student each school year. The extra time allowed teachers to accelerate curriculum coverage, broaden classroom assessment techniques, and develop students' language and thinking skills. The extra time was also used to aid struggling students and contact parents in support of classroom learning. As stated in program records:

Spreading my time and support over 15 children allows me to spend 44% more time with each child than I would in a class of 25. This translates into approximately 36 hours more a year of individual attention, intervention and teaching per child. This amount of time has proven to make a major difference for struggling students in their level of academic achievement and ability to be successful. (School District, [1997c](#), p. 7)

The extra time generated by the reduced number of students has allowed the children to develop their language, vocabulary and problem-solving skills. (School District, [1999b](#), p. 4)

...increased opportunity for language development, problem solving and creative grouping afforded by the extra time generated as a result of smaller numbers. (School District, [1998b](#), p. 1)

There is time to have individuals prove what they have learned through a number of activities, such as presentations and displays of student knowledge. (School District, [1999b](#), p. 7)

As stated in the focus group transcript:

If you have 15 little children to get around to instead of 30, you can get through almost twice as much stuff, you know, you can just get through more curriculum. (line 76)

I feel like going down to 15 also just brought the parents right in with it because you have smaller numbers; you also have more time to contact the families and the parents. (line 86)

Individualization

Individualization was another key benefit of class size reduction. Fewer students in the classroom created an academic "pop out" effect, making students more noticeable and engageable. Teachers could focus attention on the whole student (academic, social, emotional, developmental) and generate a deeper understanding of unique strengths and learning needs. The individualized understanding could be used to tailor the teaching and learning process. It also enabled "real time" feedback and view of student progress. As stated in program records:

We are more aware of their talents, fears, habits and self developed strategies so that we can incorporate and expand them and help students use them to their best advantage. We are able to talk with children more frequently to give feedback and guidance. (School District, [1998b](#), p. 4)

Daily in our classes we are able to work in small groups and/or one on one. (School District, [1997c](#), p. 6)

As stated in the focus group transcript:

I think also when there's only 15 you know immediately what level every child is at. And you can meet his needs right away. (line 65)

...we can touch base often enough with everybody so that they feel like they, they can see their own progress. It's not like two months from now my teacher will say hi to me again and tell me I did a good job in math. You get told everyday and you get told just about every activity. (line 417)

But you can look around that little class of 15 and say ooh, you haven't said anything for a while, Suzie. I find that with a larger group we [teachers] would just sit back and quietly let the rest of them [students] do the work. Especially with younger kids, it's not realistic to think you're going to get around to 30 kids on one question. Or in one class period, time just doesn't permit that. (line 394)

It's really hard, I think, to dodge us [teachers] when there's 15. Where once you get up near 20 and over, you [students] can learn to be anonymous. (line 401)

The individualization element of CSR promoted parental support of classroom learning. Parents perceived their children receiving special classroom attention, which produced a comfort zone and confidence in classroom learning. Parents became more willing partners in their child's education. Teachers reciprocated by exploring new avenues to involve parents in classroom learning activities. As stated in the focus group transcript:

I think that this has made the parents more comfortable [15 in this class]. That teacher really knows my child. And I need to really help out. It's just made them a little more comfortable. They've become much more a combo for just working with their child at home. (line 247)

How parents feel more welcome with a smaller class, I'm more willing to try things that involve parents. We do more small-group things where parents may come in. We do more computer stuff where they come in and, you know, cycle through the kids' work individually. (line 157)

And the most important thing to them is there's 15 children in the classroom. Because there's 15 children, I [parent] know my child is going to be looked at and taken care of. Things are going to be handled right away. That was the one thing that so many parents came in and said that was so important to them. Because they knew they were going to be taken care of because there was only 15 in that classroom. They weren't going to get lost. (line 1,010)

Classroom Effectiveness

The reduced class size contributed to the higher-order teaching and learning opportunity by improving classroom effectiveness. Teachers were able to use and manage a variety of instructional groupings due to the reduced number of students. Individualized learning interventions could also be made without sacrificing control or responsiveness to the larger group of students. As stated in program records:

A class of 15 allows for the recommended number of groupings that are manageable. (School District, [1999b](#), p. 10)

We are able to more effectively use flexible grouping strategies to meet the ever-changing individual needs, styles, and personalities of our students. (School District, [1998b](#), p. 4)

As stated in the focus group transcript:

...a child who's having a problem with a math test, you can pull that child out. You can sit them down at the table with you and you can work with them while the others are continuing with their work right then and there. When you have large classes, especially in the lower grades, you pull one out you start to lose them and the rest of them start wondering what you're doing. And with the 14 they'll just continue right on working. (line 42)

...the class reduction is wonderful because when a problem arises, you see it and get at it immediately. You don't have to wait for after school. You can do it right then and right there when it is still fresh in the child's mind. (line 37)

With only 15 you know immediately what level every child is at instead of taking 2 to 3 weeks to find out. (line 66)

Classroom Climate

The fewer number of students contributed to the higher-order teaching and learning opportunity by improving classroom climate. Classrooms were described as engaging, comfortable and trusting. A family-like atmosphere emerged and motivated students to learn, promoted more confidence, and more academic risk-taking. A positive relationship between reduced class size and reduced behavior problems in the classroom was reported by teachers. As stated in program records:

Any classroom teacher anywhere will confirm that class size is THE most important issue in creating a climate conducive to learning for all students. (School District, [1997c](#), p. 3)

Classroom climate continues to show high levels of motivation. (School District, [1999b](#), p. 6)

There are fewer behavior problems. (School District, [1998b](#), p. 4)

As stated in the focus group transcript:

I think our kids really feel part of a family in the classroom. Because they do have so much more time to speak out and feel more confident. And they have more confidence. (line 423)

...the children that would've been just lost and sit back and say absolutely nothing in a large group, have now kind of become their own person and they feel very confident that I can say something and nobody's gonna laugh at me. It's a small group and everybody's real close and they feel confident that they can say something and maybe it's gonna be wrong, but they're taking the risk and they're trying to do that and it's hard. (line 383)

4. Staff Development: "Action Research and Development Cycle"

The staff development component provided participants regular opportunities to meet, collaborate, and work as an integrated group toward the common goal of improved student achievement. The component evolved into a continuous action research and development laboratory focused on actualizing the SAGE concept. The school's curriculum was the predominate research focus. This cycle of action research and development moved the SAGE program from theory to practice. As stated in program records:

Allowed staff to get together on a regular basis for professional development; to Plan, Communicate, Discuss Execution, and to evaluate with a regular repeat of that cycle. WE MOVED FROM THEORY TO PRACTICE BECAUSE OF THIS. (School District, [1999b](#), p. 1)

Staff development has been an ongoing process. We are able to create new activities and projects which allow us to reach every learner. (School District, [1999b](#), p. 8)

As stated in the focus group transcript:

All the time our SAGE meetings that we're allowed per grade level give us that opportunity to talk with one another. To share ideas for the benefit of the kids. (line 109)

That time together has also allowed us to go back and evaluate. And ask was it working? Did it turn out the way we wanted it to? Did it get the effect and the value that we wanted or anticipated that it would? That's just as important a piece as the initial planning. Being able to continually refine what you've found has worked and bring it up to another level. Or forsake it in terms of something that you feel will get better. Or adjusted some way. And that takes a lot of time. That comes from hearing other people say, well, here's how it worked for me. Here's what I did. Here's what happened when I did something. Then I get other perceptions on how I might want to do it. (line 132)

Staff development to me goes beyond just sitting in a room learning about something new. It's time to think, it's time to plan, it's time to experiment, to research resources, all of those kinds of things. I think you can rigor up the curriculum, and you can get around to more kids, but at some point if you're truly trying to effect the change, it has to go beyond that in order to sustain what you've been able to do increasing the rigor and making better use of your time with 15 as opposed to 25 or 30. You've gotta have some time to work through how you're going to do that. To explore options. Checks and balances and all those things. (line 99)

Action Research and Development

The action research and development function of staff development was focused on the school's rigorous curriculum. Staff engaged in meaningful interaction toward research, planning, experimentation, refinement, and derivation of a common philosophical and working understanding of the curriculum. The result was a consistent, articulated, and evolving curriculum on which teaching and learning expectations could be formed to facilitate achievement. As stated in program records:

This has created time to maintain focus on the standards and stay in alignment with goals and objectives throughout the year. (School District, [1999b](#), p. 8)

As stated in the focus group transcript:

It also allows you to be consistent. One of the things I think that has made us successful is that we are basically very consistent across grade level. And then seamless from grade level to grade level. That takes interaction. And you can't do it standing in the hall. And you can't do it in 5 minutes. You have to understand each other's positions philosophically. Where you come from. What we meant by this, what we thought of when someone said staff development or rigorous curriculum. Or raising the bar or whatever the terms were or the concepts. We worked really hard and spending a lot of time on finding out what we all understood that to be. And then working with that. Incorporating that into our own thinking. (line 112)

5. Rigorous Academic Curriculum: "Higher-Order Curriculum, Instruction, and Assessment"

The rigorous academic curriculum component directly affected student achievement by requiring a transition to a higher-order curriculum. Teachers worked together to develop a seamless curriculum integrating local, state, and national content standards, critical thinking skills, and parental accountability for learning. Thinking and problem-solving skills became normalized in

the teaching and learning process. Routine classroom activities and projects challenged students to acquire knowledge, extend meaning, and make inferences.

The higher-order learning required an expansion of assessment strategies. Students were provided opportunities to show learning in a variety of ways. The multiple assessment products were used to construct learning portfolios that presented a more thorough picture of student learning. As stated in program records:

Using these standards we are able to develop lessons and assessment for higher level thinking skills. (School District, [1999b](#), p. 7)

Higher level reading and problem-solving skills are part of the program. (School District, [1999b](#), p. 4)

Writing projects, using chapter books, problem-solving and higher level thinking skills activities continue to be part of our curriculum as regular activities. In addition, we have been able to add things like individual research projects, activities that focus on reading for information and confirmation and genre's of literature. (School District, [1999b](#), p. 6)

I like the portfolio system because it helps me and my child know where they stand. (School District, [1997c](#), p. 2)

Students are allowed to develop and create their own assessment projects in order to cover their full range of understanding. (School District, [1999b](#), p. 7)

As stated in the focus group transcript:

The rigorous curriculum became more problem-solving and abstract. Because we are focusing on a higher level of thinking skills. (line 491)

Raised Expectations

The rigorous curriculum raised the achievement expectations at the SAGE school. More students displayed higher level reading performance in response to the challenging curriculum. Teachers reported that students were motivated by the learning challenge and became more confident in their ability to achieve at higher levels. The curriculum was also rigorous and flexible enough for higher-achieving students to move forward at an accelerated pace. As stated in program records:

We were able to go beyond our basic second-grade curriculum with many students instead of just a few in the past. (School District, [1999b](#), p. 6)

Last year we offered five reading levels in the "SAGE Reader" program. This year we increased it to six in order to meet the needs of the higher-level readers. (School District, [1999b](#), p. 4)

This year the reading specialist set up an independent program for two of our above-grade-level readers and met with them to monitor their progress. (School District, [1999b](#), p. 4)

We were pleased that we were able to extend many of our children into a more "formal" reading this year. (School District, [1999b](#), p. 2)

...we feel that we have certainly raised the level of expectation for those who demonstrate a fundamental readiness. They certainly loved the challenge and were excited and confident about their abilities as readers. (School District, [1999b](#), p. 2)

Student Readiness-to-Learn

The rigorous curriculum component helped to improve student achievement by reducing beginning of the year review time. Teachers possessed a thorough understanding of the inter-grade-level curriculum and were provided standard-specific evidence of student learning upon grade level promotion. This produced a smooth transition across SAGE grade levels and increased the amount of curriculum coverage. Staff also reported students were better prepared to learn, as evidenced by fewer "gray area" students. As stated in program records:

This year's second-graders arrived confident, independent and sure of "what they knew." They required far less review in the beginning and less reteaching as the year progressed. Several students entered second grade with skills that we don't usually see until later in the year and there were fewer "struggling" students than in past years. (School District, [1998b](#), p. 4)

The rigorous curriculum of SAGE has allowed us to cover more lessons and material than ever before. (School District, [1999b](#), p. 6)

SAGE has effectively put into place the pieces to intervene with students we have referred to in the past as "gray area" students. We see very few students with this type of academic pattern anymore. (School District, [1999b](#), p. 6)

As stated in the focus group transcript:

But in terms of rigorous curriculum and the fact that it's so focused, helped me to narrow down where it is I probably needed to check on. (line 231)

I use to spend anywhere up to a month reviewing at the beginning of school. I spent about three or four days this year and I was done. (line 227)

Parental Support

The SAGE school staff integrated a parental support component across its rigorous curriculum. Parents, students, and teachers were required to sign an annual compact agreement setting the learning goals and expectations of each party. The compact obligated parents to help their children achieve. Parents were routinely informed of their student's academic performance and classroom behavior and asked to intervene when needed. As stated in program records:

The degree of parent involvement helps further identify and recognize students' individual strengths and weaknesses. This in-depth understanding of each individual allows lessons to be more specifically tailored in order to raise the level of understanding and success. (School District, [1999b](#), p. 7)

As stated in the focus group transcript:

Then part of our rigorous curriculum is what we expect of the child at school and at home. In first grade we send home the SAGE School reader bag every single night, with a book in it for the child to work on and this year we've added flash cards to that bag. And the parents have to sign each night. To say that they've read to their child. And I think that is such a support system. Just doing that increases your rigorous curriculum immediately because they are doing so much of the necessary things like reading it with their child. (line 262)

If you don't have children who are behaving then you're not going to achieve. And the parents again have to sign that form and they're alerted as to what's happening. And they're writing to you or calling you asking you why. And that supports our curriculum. (line 274)

(The) Partners in Learning Compact that we set up and they (parents) take it quite seriously. So they have an obligation that if we promise to help their children achieve then they too need to promise to help their children. (line 88)

6. Education and Human Services: "Family - School Working Relationships and Extra Learning Opportunities"

The education and human services component produced a direct and indirect achievement impact. The component directly affected achievement by providing extra learning opportunities for participants directly linked to the school curriculum. The component indirectly affected achievement by aiding the formation of working relationships between adults, students, and teachers through before- and after-school events.

Family - School Working Relationship

The education and human services or "lighted school house" events that involved family members provided teachers a better understanding of the student's learning context outside the classroom. This insight helped teachers tailor classroom instruction to the student's unique interests, needs, and home resources. Teachers were also able to establish a comfortable rapport with parents and other family members. This facilitated school-home communication and responsiveness regarding learning expectations, achievement, and strategies parents could use to maximize at-home learning. As stated in program records:

The lighted schoolhouse aspect of SAGE has enabled us to offer monthly parent/ family activities that have greatly increased our family contacts. We have been able to get to know families and their priorities better, increase the variety of opportunities for them to participate in valuable ways, increase the understanding of what happens in the classroom and work in a true partnership with them. (School District, [1998b](#), p. 4)

Evening events and classes for the parents and child, is a prime time for the parent to keep up with their child's progress. Learn exactly what is expected of their child for their grade level. This helps us at home in helping our children. (School District, [1997c](#), p. 9)

We see a marked difference in the comfort and understanding of our families in regard to school and how it works. (School District, [1999b](#), p. 6)

As stated in the focus group transcript:

It's another way to get to know those parents. Which helps you to know their children better. It helps you to understand how things work at home and what kind of interactions the families have. Without that, you miss a piece of the child. (line 210)

Extra Educational Opportunities for the Family

The education and human services component enabled students to improve and reinforce their knowledge and skills beyond the regular school day or calendar. Extra educational opportunities for the family were offered to show what students are learning and to give adults a chance to improve their own skills. The adult family members were also provided resources to initiate and sustain at-home teaching and learning. As stated in program records:

Students have the opportunity to come in before 8 a.m. and stay after school to work on and reinforce skills in the classroom. (School District, [1999b](#), p. 7)

The first-grade team offers monthly computer nights to families. The computer nights are set up to have students show what they are working on at school, to provide opportunities for adult-student working relationships, and to give instruction to interested adults. (School District, [1997a](#), p. 4)

We have also been able to improve the home lives of children through the parent education that occurs in MegaSkills, our parent resource library and curriculum nights like Family Math and how to use reading strategies. (School District, [1998b](#), p. 4)

The Interaction of CSR and other SAGE Components

Although the main effects of SAGE were stated *a priori*, interaction among the components was not hypothesized. A symbiotic relationship between CSR and other SAGE components was discovered for the evaluand. The emergent combinations are depicted in [Figure 2](#) and reported in this section.

CSR and Staff Accountability

CSR balanced high-stakes accountability by reducing some professional risks associated with the student achievement guarantee. Staff perceived reduced class size as a necessary classroom condition for attaining and sustaining more student achievement. In particular, smaller classes gave teachers hope of individualizing the teaching and learning process to meet the unique learning needs and styles of students. As stated in the focus group transcript:

And I think that just knowing that we were accountable, knowing that it was gonna be on paper and that it was gonna be tested. You made sure you got to every child. And you knew that with the small numbers that it was possible. It wasn't a hopeless task. So, that accountability combined with the small class sizes. (line 201)

...you could have a small class size and just do the same old thing but having the small class size and then raising your expectations you see that it's possible. Whereas you could have all these high standards and 30 little five-year-olds and there is just no way that this is going to happen. I can't even get around to them to show them how to make a letter K. How am I going to expect

them to have all this achievement? But, when you have just 15, you can get around to them and it seems possible that you'll be able to meet those standards. (line 50)

CSR and Rigorous Academic Curriculum

CSR provided opportunities for teachers to effectively implement and execute the higher-order curriculum. There was more time to individualize and engage students in the teaching and learning process. Classrooms were more manageable and teachers could successfully monitor matters like out-of-class assignments. As stated by focus group participants:

I see... the class size going along with the rigorous curriculum. The two just really back one another up. (line 49)

I was with...another kindergarten teacher (from another school) who has a larger group of children. And she was saying, What do you think about the new reading program? I said I love it. You can just do so much and there're so many components. And she says, "Oh, I hate it." I can't get them all pulled together to settle down and concentrate on it. Cause she's got 25. She's got some difficult ones. And she says I know it would be neat, but it's just I've got so many. And it's so crowded and I just can't get them to focus. And it's just terrible. And I thought how different that was from our experience. And it's not because she's a bad teacher and we're good teachers. It's just that sheer number thing. You know you just can't pull that many into the kind of interaction that this program calls for. And I thought here are two people just because of class size have totally different impressions of the same curriculum. And I thought, yea, I think if I did have 25 little five-year-olds sitting there trying to do some of the activities that there are with this new reading program, I would be tearing my hair out, too. (line 366)

You drop the class size and raise your expectations and now you have time to do this [The SAGE School reader program] because you have 15 students. If you had 30 or 25 you might not, some of us are not home every night and check it every morning to see if came back. But because you have 15, you're willing to do that. (line 268)

The rigorous curriculum...the class size allows you to think about other things that are possible. (line 215)

The CSR component enabled the proper execution of the instructional and assessment methods required of the higher-order curriculum. Teachers were able to use more student-centered and flexible grouping instructional strategies. There was opportunity for more hands-on and enrichment activities. Reduced class size also provided time for administration and evaluation of a variety of classroom assessment, rendering a more comprehensive picture of learning. The focused curriculum combined with fewer students to shorten review periods. As stated in program records:

With smaller classes we have found ourselves able to offer a wider range of hands-on and enrichment activities. We are able to more effectively use flexible grouping strategies to meet the ever-changing individual needs, styles, and personalities of our students. (School District, [1998b](#), p. 1)

Coupled with our extensive assessment instrument, we have been able to more accurately pinpoint our children's individual learning styles and needs and to meet those needs in a more effective way. (School District, [1999b](#), p. 4)

There is time to have individuals prove what they have learned through a number of activities, such as presentations and displays of student knowledge. (School District, [1999b](#), p. 7)

As stated in the focus group transcript:

...small class size and the rigorous curriculum make it possible for you to address childrens' learning styles. (line 356)

...smaller class size has given us the opportunity to change some of our teaching styles. Instead of doing so much large-group presentation, you're spending lots more time partnering children and working with small groups. (line 352)

I use to spend anywhere up to a month reviewing at the beginning of school. I spent about three or four days this year. But that's because I knew exactly where to target that review and then I didn't have such a large amount of children to target. (line 227)

The other thing with rigorous curriculum is that it sets a standard that we all understand. So that I can make the most out of my reduced class size. (line 217)

CSR and Education and Human Services

CSR combined with the education and human services component to encourage attendance at before- and after-school activities and strengthen the working relationship between family and school. Smaller class sizes provided more opportunities for school-day interaction, which produced a comfortable rapport between school and family. The rapport improved the likelihood of family participation in extra educational opportunities offered as part of the education and human services component. As stated in the focus group transcript:

Dealing with smaller class sizes you get to know the parent much, much better. You offer more activities for them to come to the classroom. So when you offer an evening activity knowing the parents feel more comfortable because they know you well. They'll take a chance and they'll come in and do things. I think if we had 30 children per classroom we might not know the parents as well. The lighted schoolhouse is doing much better because of the smaller classes and the parents' comfort zone. We have made it very comfortable. (line 233)

Class size reduction also supported the education and human services component through parental individualization. Teachers had an opportunity to spend more quality time with parents at before- and after-school activities due to the reduced numbers. The extended time for expression of genuine interest strengthened the working relationship between the family and school and improved the chances of parental participation at future events. As stated in the focus group transcript:

Well...when they [parents] come they get a better quality experience than if you were trying to pan to a class of 25 or 30. The same thing happens to parents that happens to kids. If I can only touch base with you for a minute, you may walk away dissatisfied. Where if I can spend 5 or 6 or

7 minutes with you when you came I think you're much more likely to feel that I was genuinely interested in investing some time in you just like the kids feel. (line 241)

Staff Development and Rigorous Academic Curriculum

The staff development component combined with the rigorous academic curriculum component to yield and evolve the higher-order curriculum. Staff used the time to engage in "action research and development" focused on curricular issues. Teachers used the opportunity cooperatively to develop and refine the school's curriculum. The time was also used for evaluation of classroom assessments and development of strategies for reporting student achievement. As stated in program records:

This time allowed us to be Action Research-oriented curriculum planners, not just teachers. (School District, [1999b](#), p. 1)

This area is ongoing through our scheduled whole group and grade group planning and evaluation times throughout the year and during the summer. (School District, [1999b](#), p. 3)

Our SAGE team was able to collaboratively work together to develop a rigorous curriculum. (School District, [1997c](#), p. 5)

...to create new assessment materials and rubrics, revise tests (CRTs), share ideas, graph student progress, put together information to share with families and reflect and evaluate the progress of individual students and lessons. (School District, [1999b](#), p. 8)

The strategies and assessment needed could not be handled without staff development to support them. (School District, [1999b](#), p. 10)

We have created new ways of assessing and recording that reflect differing styles, intelligences, backgrounds and prior knowledge development. (School District, [1999b](#), p. 6)

As stated in the focus group transcript:

We've really been able to take a very good look at assessment in terms of how well it's matched what we do. And where the gaps are and when things don't turn out well on assessment, we have some ideas and some strategies to put into place. You know, immediately make an improvement rather than second-guessing it. We know how to break that down and look at it as pieces of a picture rather than one huge piece. We've learned how to recognize that test scores aren't the only picture of a child's achievement. But we've learned ways to separate what's happening and here's what the test can show you. Here's the other pieces we have that can show you the rest of the picture. So that if the test or assessments aren't as good as we'd like them to be, or don't show everything we like; we can readily identify tools and activities that would show the rest of the picture. Rather than having to rely just on those major high stakes kind of assessments. (line 340)

Through the hands-on development process, staff gained a common and thorough understanding of the curricular scope and sequence. The understanding facilitated the alignment of classroom instruction and assessment. Teachers were enabled to assess a SAGE student's grade-level learning status quickly, shortening review time and facilitating the commencement of new

learning. The ultimate result was a more efficient and responsive teaching and learning process. As stated in program records:

The rigorous curriculum of SAGE has demanded that we know our curriculum inside and out and therefore is more responsive to student needs. (School District, [1998b](#), p. 4)

Developing a rigorous academic curriculum has increased our knowledge of the state and district standards. (School District, [1999b](#), p. 7)

The rigorous curriculum has led to new and more efficient practices in the classroom. (School District, [1999b](#), p. 10)

As stated in the focus group transcript:

I know coming in what I can expect with second-graders to be able to do. Because I know what it took to get out of first grade. I know exactly, skill-by-skill what it took for them to get out. I know what I can count on, therefore I can hit the ground running. With this number and not take time to go through not only my 15 or even when you have somebody referenced that it takes you longer to get to know the kids. Within SAGE, I spend very little time having to get to know where kids are at. I know that. I can make certain assumptions coming in. For the most part I can count on it. (line 219)

Education and Human Services and Rigorous Academic Curriculum

The education and human services component enabled students to improve and reinforce their knowledge and skills beyond the regular school day or calendar. Extra educational opportunities for the family were offered to show what students were learning and to give adults a chance to improve their own skills. The adult family members were also provided resources to initiate and sustain at-home teaching and learning. As stated in program records:

The first-grade team offers monthly computer nights to families. The computer nights are set up to have students show what they are working on at school, to provide opportunities for adult-student working relationships, and to give instruction to interested adults. (School District, [1997a](#), p. 4)

Limitations

The consumer of case study evaluation must be aware of factors that affect conclusions, recommendations, and generalizations. Delimitations indicate the population for which generalizations may be applied and depend upon the conditions of randomization and sampling (Locke, Spirduso, & Silverman, [1987](#)). In this study, generalization of results is constrained to the local district. However, transfer of findings beyond the evaluand may be possible if the consumer determines a salient overlap in context (Guba & Lincoln, [1989](#)).

Existing records have limitations and must be evaluated within the context of the program. Data from records can be limited in accessibility, quality, scope, authenticity and completeness (Rossi, Freeman, & Lipsey, [1999](#)). The data can also be manipulated to cast a favorable light on a

program, practice, or policy. Alteration to management information systems can also limit the reliability of records. For example, accountability criteria, data collection forms, and formats may change over a program, requiring reinterpretation of previously collected data (Lincoln & Guba, [1985](#)).

The records used in this study met the quality indices. However, the reader must be aware that some of the records contained testimony designed to persuade decision-makers of program success. Investigators must also beware of records that do not suggest any weaknesses or areas for improvement. Staff was required to identify and report program weaknesses to officials each school year. SAGE staff was also required to record the areas for improvement and plans for implementing, correcting, or fortifying strategies.

Focus group data are subject to several limitations. Generalization of findings is limited due to the purposive sampling technique used to select participants and the interdependent nature of the collected data. The focus group data represented viewpoints of kindergarten, grade 1, and grade 2 teachers. Grade 3 teachers were not represented.

Summary of Results

This case study evaluation explored how reduced class size combined with other reform initiatives and contextual factors to affect student achievement. The evaluand was an elementary school that implemented Wisconsin's fortified CSR program (class size reduction, education and human services, rigorous academic curriculum, & staff development and accountability) named SAGE. Evidence was collected from existing records and purposively selected SAGE teachers via a focus group. A three-phase "cut and paste" analysis strategy was used to reduce data, display data, and draw and verify conclusions. [Table 6](#) presents a summary of the main and interaction effects.

The results confirmed and extended the theorized main effects of class size reduction and the other school reforms. Unanticipated symbiosis between CSR and other components was also discovered. Fewer students produced classroom conditions that aided implementation and execution of a higher-order curriculum that, in turn, made heightened accountability for student achievement more palatable. CSR also encouraged family participation in before- and after-school events by providing more opportunity for interaction and individualized parental attention. Likewise, the staff development and education and human services components were linked to a common instructional framework. In sum, the combination of reduced class size and other SAGE reforms within a "program-friendly environment" strengthened instructional program coherence (IPC) for the evaluand.

Table 6
Main and Interaction Effects of CSR, Other Reform Initiatives (SAGE Components), and Contextual Factors

Reform Initiative and Effect

Main Effects			
1.	Context	➔	<i>Program-Friendly Environment</i>
2.	Staff Accountability	➔	<i>High-Stakes Teaching and Learning Environment</i>
3.	Class Size Reduction	➔	<i>Higher-Order Teaching and Learning Opportunity</i>
4.	Staff Development	➔	<i>Action Research and Development Cycle</i>
5.	Rigorous Academic Curriculum	➔	<i>Higher-Order Curriculum, Instruction, and Assessment</i>
6.	Education and Human Services	➔	<i>Family - School Working Relationships and Extra Learning Opportunities</i>
Interaction Effects			
1.	CSR - Staff Accountability	➔	Reduced Professional Risk of <i>High-Stakes Teaching and Learning Environment</i>
2.	CSR - Rigorous Academic Curriculum	➔	Enabled Proper Implementation and Execution of <i>Higher-Order Curriculum, Instruction, and Assessment</i>
3.	CSR - Education and Human Services	➔	Enhanced <i>Family - School Working Relationships and Extra Learning Opportunities</i> via Parent Individualization
4.	Staff Development - Rigorous Academic Curriculum	➔	Developed the <i>Higher-Order Curriculum, Instruction, and Assessment</i>
5.	Education and Human Services - Rigorous Academic Curriculum	➔	Provided Extra Improvement and Reinforcement Opportunities Relating to <i>Higher-Order Curriculum, Instruction, and Assessment</i>

Conclusion

Much research has focused on detecting and explaining the CSR achievement impact. A common theme is that smaller classes affect student achievement by individualizing the teaching and learning process. Results of this study suggest smaller classes may also affect student achievement by facilitating the coherence of school-level instructional programs, a concept defined as "a set of interrelated programs for students and staff that are guided by a common framework for curriculum, instruction, assessment, and learning climate and that are pursued over a sustained period" (Newmann, Smith, Allensworth, & Bryk, [2001](#), p. 297). CSR strengthens IPC by creating working conditions that support implementation of the common

framework. IPC, in turn, improves student achievement by "helping teachers to work more effectively on problems of school improvement and by directly increasing student engagement and learning" (Newmann, Smith, Allensworth, & Bryk, [2001](#), p. 300).

Suggestions for Future Research

Much of what is known about class size reduction has been generated by large-scale, objectives- and management-orientated evaluation studies. The decontextualized evidence yields a partial understanding of the successes, failures, opportunities, and challenges associated with CSR. Future studies should involve multiple stake-holding groups and include mixed-methodologies to gain a whole perspective of how reduced class size may be contextualized to improve student achievement via instructional program coherence. Experimentation and comparison of fortified CSR initiatives applied in diverse contexts would suggest models of best fit for urban, suburban, and rural schools.

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