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School Size

After decades of district consolidation and the construction of larger and larger schools at both the elementary and secondary levels, momentum and support in the U.S. have shifted during the past several years toward the creation of small schools. This shift has become most apparent in some of our nation's largest urban districts, including New York, Chicago, Boston, and Philadelphia, where significant numbers of small schools have been started with the help of federal and private funding.

The growing support for small schools stems from a belief that many of the problems associated with today's schools are related to their size. In this paper, a synopsis of the research evidence regarding school size and its relation to educational outcomes is presented. Most of the recent evidence focuses on secondary schools since the majority of large schools in this country serve secondary-level students. However, it appears that similar conclusions can be drawn for elementary schools as well.

Conclusions concerning student achievement scores are still tentative, but it appears that small schools, regardless of their structure (i.e., autonomous small schools, historically small schools, theme-based or focus schools, etc.) can produce other positive results for their students, including greater participation rates in extracurricular activities, higher attendance rates, lower dropout rates, and lower levels of violence and other negative social behaviors. In addition, achievement in small schools is more equitably distributed across students, regardless of their race/ethnicity and socioeconomic status. Low-income and minority students, in particular, appear to benefit from small schools. The impact of school size on teacher outcomes is mixed.

School size alone, however, is not a panacea for the problems facing our nation's schools. Whether or not small schools are effective seems to depend more directly on the social and academic conditions that are created within the schools than on their absolute size. The key elements that appear to be needed for small schools to be effective include the following:

- a **personalized environment** in which students and teachers develop strong, supportive relationships so that students feel cared about and teachers know their students;
- **autonomy** to control decisions about staffing (including the hiring of teachers), resource allocation, scheduling, and curriculum and instruction;
- a strong **focus on student learning**, with a coherent and purposeful curriculum, pedagogy that is adapted to students' needs; high, rigorous standards for all students, and support systems for students who need extra help to attain those standards;
- a **supportive environment** for teachers, in which teachers feel supported by their colleagues and administrators, can make key decisions about curriculum, instruction and assessment, have time to collaborate with each other, and are provided with ample opportunities for professional development;
- **accountability** focused on student achievement;
- and for small schools located within large school buildings, **separateness and distinctiveness** so that students and teachers are able – both physically and psychologically - to closely identify with their small school.

To the extent that small schools are better able than large schools to create these conditions within their schools that make a difference for teaching and learning, then small schools appear to be a promising strategy.

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Karen J. DeAngelis

Introduction

After decades of district consolidation and the construction of larger and larger schools at both the elementary and secondary levels, momentum and support in the U.S. have shifted during the past several years toward the creation of small schools. This shift has become most apparent in some of our nation's largest urban districts, including New York, Chicago, Boston, and Philadelphia, where significant numbers of small schools have been started with the help of federal and private funding (Wasley et al., 2000).

The growing support for small schools stems from a belief that many of the problems associated with today's schools are related to their size. This is particularly true for the large, comprehensive high school, which was recently described by one critic as an "inhumane institution" (McQuillan, 1997, p. 645). In this *Issues in Education*, I present a synopsis of the research evidence regarding school size and its relation to educational outcomes. Most of the recent evidence focuses on secondary schools since the majority of large schools in this country serve secondary-level students. However, it appears that similar conclusions can be drawn for elementary schools as well.

In sum, the research shows that school size alone is not the cure-all for our schools' ills. At best, it appears that small schools *under the right conditions* can create social and academic environments that lead to improved student outcomes, particularly for disadvantaged students. To the extent that small schools are better able than large schools to create the conditions within their schools that make a difference for teaching and learning, then small schools, as the National Research Council (2004) concludes, appear to be a promising strategy.

How small is "small"? [1]

There is no agreed upon definition of "small" in the school size literature (Cotton, 2001; Gladden, 1998; Muir, 2000-2001; Raywid, 1999), although Raywid (1999) observed that those who emphasize the importance of a school's environment tend to advocate for lower enrollment limits than those who emphasize academic effectiveness. Recommended school sizes include:

- no more than 200 students (Gregory, 2000),
- less than 400 students (Wasley & Lear, 2001),
- less than 400 students at the elementary level (Lee & Loeb, 2000),
- about 200 to 500 students (Fine, 1998; Fine & Somerville, 1998),
- about 400 to 800 students (Cotton, 1996),
- and less than 1000 students (Howley et al., 2000).

Lee (2000) notes that 600 students is a popularly used figure in the literature, despite the fact that little empirical evidence exists to support that number. In the only empirical investigation of the "optimal" school size, Lee and Smith (1997) found that secondary school effectiveness - as measured by average achievement gains in mathematics and reading - is maximized in schools serving 600 to 900 students, although learning gains tend to be distributed more

[1] The terminology used to describe small schools is complicated due to the fact that small schools tend to be structured in many different ways. Various labels, including autonomous small school, small learning communities, theme-based or focus school, alternative school, freestanding school, historically small school, school-within-a-school, and career academy, are employed in the literature. See Cotton (2001) for a detailed description of these school types.

equitably across students in schools with less than 600 students. Notwithstanding this lack of consensus, many schools in the United States exceed even the largest recommended size for schools with over 29% of secondary schools and nearly 5% of elementary schools enrolling 1000 students or more (National Center for Education Statistics, 2003).[2] In this report, I follow the lead of a number of researchers in this area and employ the terms "small" and "large" in a relative sense, unless noted otherwise.

The Evidence [3]

Over the last half-century, support for large schools, most notably at the secondary level, has been based on two beliefs. First, large schools are less expensive to build and operate than small schools due to "economies of scale", an economic term associated with the increasing efficiency of the production of a good as the number of goods being produced increases. Second, large schools at the secondary level are better able than small schools to offer a comprehensive array of courses, thereby providing better academic opportunities for all students (Lee, 2000). Both of these arguments favoring large schools have been challenged in recent studies (Dolinsky & Frankl, 1992; Haller et al., 1990; Heinbuch & Frankl, 1992; Monk, 1987; Stiefel et al., 2000). Stiefel et al. (2000), for example, compared the budget per student of small (less than 600 students) and large (more than 2000 students) high schools in New York City and found that while the small schools had somewhat higher budgets per student, their budgets per graduate were comparable to those of the large schools due to the higher dropout rates associated with the large schools. Given that a primary goal of the education system is to graduate students, small schools appear as cost-effective as large schools according to these results.

With regard to the comprehensiveness of high school programs, Monk (1987) and Haller et al. (1990) found that comprehensiveness does increase as school size increases, but it levels off at low to medium enrollment levels, depending on the subject area. For math, schools with 50-99 students in the graduating class (about 200 to 400 students total) are able to offer an array of courses similar to that offered in even larger schools, whereas schools seem to require about 200 students in the graduating class (800 students total) to offer a similar selection of science and foreign language courses as larger schools (Haller et al., 1990). These results compare favorably to the recommendations of Conant (1959). James B. Conant, who often is credited with (or blamed for) the movement toward larger, comprehensive high schools, believed that schools need 100 students or more in a graduating class to implement a comprehensive curriculum. Thus, while it appears that very small schools may limit course-taking opportunities for students, schools need not be very large to offer comprehensive programs.

Achievement Scores

The growing excitement over small schools obscures research findings showing mixed results in student achievement scores between small and large schools (Cotton, 1996; Gladden, 1998; Muir, 2000-2001). Gladden (1998) suggests that the mixed results are due to a failure by researchers to account for mediating effects of school environment and other variables on the size-achievement relationship; studies that account for mediating effects, he contends, tend to find a negative relationship between size and achievement, supporting the argument for small schools. Based on the studies reviewed for this *Issues in Education*, I found another pattern in the literature that may explain some of the

[2] Over 57% of secondary schools and about 41% of elementary schools enroll 500 students or more. And nearly 39% of secondary schools and over 11% of elementary schools enroll 800 students or more (National Center for Education Statistics, 2003).

[3] To the extent that many small schools, most notably those that are specially created to be small, are able to select both the students and teachers in those schools, the benefits of small schools cited in this section are likely overstated. Selection bias, however, is unlikely to account for all of the differences found between small and large schools (National Research Council, 2004).

inconsistencies. Studies that employ a sample of data from an existing population of schools (such as a national, state or district sample of schools) fairly consistently - albeit not universally - find that student achievement is higher in small schools compared to large schools (Bryk & Driscoll, 1988; Eberts et al., 1982; Friedkin & Necochea, 1988; Fowler & Walberg, 1991; Gamoran, 1996; Howley, 1996; Huang & Howley, 1993; Lee & Bryk, 1989; Lee & Loeb, 2000; Lee & Smith, 1995, 1997).[4] In contrast, the findings from case studies and studies that utilize smaller samples of schools to compare the achievement outcomes of newly-created small schools or redesigned existing schools and comparison schools (i.e., matched schools, formerly-existing large schools, or host schools) tend to be more mixed on this outcome (Crain et al., 1999; Darling-Hammond et al., 2002; Kemple & Snipes, 1993; Wasley et al., 2000). Perhaps these latter results are due to the relative infancy of many of these schools or, perhaps, as Fine (1998) reminds us, "there are bad small schools" (p. 4).

Equity in Achievement

While conclusions regarding the effects of school size on achievement for students in general should still be regarded as tentative, there is strong and consistent evidence showing that achievement in small schools is more equitably distributed across students, regardless of their race/ethnicity and socioeconomic status (Freidkin & Necochea, 1988; Howley et al., 2000; Lee & Bryk, 1989; Lee & Smith, 1995, 1997). That is, the achievement gap that exists between minority versus non-minority students and high-SES versus low-SES students tends to be narrower in small schools than in large schools. Large schools, Lee & Smith (1997) conclude, tend to be disproportionately harmful to students from poor and minority backgrounds.

Other Student Outcomes

Student outcomes on a number of measures other than achievement scores tend to be as good as or better in small schools than in large schools, particularly for disadvantaged students. For example, studies have found that negative social behaviors, such as vandalism, class cutting, classroom disorder and truancy, are less prevalent in small schools than in large schools (Bryk & Driscoll, 1988; Darling-Hammond et al., 2002; Haller, 1992). Research considering dropout rates generally favors small schools over large schools (Bryk & Driscoll, 1988; Bryk & Thum, 1989; Darling-Hammond et al., 2002; Kemple & Snipes, 2000; Pittman & Haughwout, 1987; Wasley et al., 2000), although Rumberger & Thomas (2000) found just the opposite after taking into account the background and composition of schools' students. Student engagement – as measured by participation in extracurricular activities and/or attendance - also tends to be higher in small schools (Barker & Gump, 1964; Bryk & Thum, 1989; Kemple & Snipes, 2000; Lindsay, 1982; McPartland et al., 1997; Oxley, 1997; Wasley et al., 2000). Research findings on student attachment and satisfaction are less consistent, although Gladden (1998) reports that small focus or theme-based schools appear most consistent at producing positive effects on these student outcomes, perhaps because students usually self-select into such schools.

Teacher Outcomes

The impact of school size on teacher outcomes is mixed (Gladden, 1998). Bryk & Driscoll (1988), Lee & Loeb (2000), and McPartland et al. (1997), for example, found small schools to have positive effects on teachers and their attitudes, as evidenced by improved

[4] Lee & Smith (1997) actually found a curvilinear relationship between size and achievement, with mid-sized schools (i.e., schools with 600-900 students) showing better achievement results than both smaller and larger schools. Friedkin & Necochea (1988) and Howley (1996) found a negative relationship between size and achievement but only for low-SES students; in fact, their results suggest that larger schools produce better achievement outcomes for high-SES students. Fowler & Walberg (1991), in contrast, found no interaction effect of SES and size.

attendance, greater satisfaction, a higher level of staff morale, and a greater sense of responsibility for student success. Hannaway & Talbert (1993) discovered a negative association between size and teachers' reports of community, but only in urban schools; the relationship was insignificant in suburban schools. And Lee et al. (1991) found teachers' sense of control and satisfaction to be lower in smaller schools. Given that efforts to reform or recreate schools can be extremely challenging, time consuming, and fractious, especially in situations where only a portion of a school's faculty is involved (Muncey & McQuillan, 1993), these varied outcomes for teachers are not surprising. Gladden (1998) notes that teachers in small theme-based or focus schools seem to report especially strong benefits of working in those schools, perhaps again because teachers, like their students, are often able to self-select into such schools.

Small Size is Not a Panacea

A point of agreement in the literature on school size is that size alone is not a panacea for the problems facing our nation's schools. Simply reducing a school's enrollment will not magically improve student outcomes. Fine (1998) states, "Small may be necessary, but it is not a sufficient condition for quality schooling" (p. 4). Small schools, researchers contend, can promote better student and teacher outcomes by enabling changes to occur in the academic and social environments of schools that can produce such results (Bryk & Driscoll, 1988; Bryk & Thum, 1989; Cotton, 1996, 2001; Darling-Hammond et al., 2002; Fine & Somerville, 1998; Gladden, 1998; Lee, 2000; Lee & Loeb, 2000; Lee & Smith, 1995; McQuillan, 1997; Muir, 2000-2001; Pittman & Haughwout, 1987; Raywid, 1997-1998; Wasley & Lear, 2001). Taken together, these studies suggest that with fewer students and a small faculty, small schools *under the right conditions* can facilitate meaningful relationships between and among students and teachers; focused, student-centered instruction that is challenging for all students; regular opportunities for teacher collaboration and professional development; and a distributed leadership structure that allows for a high level of teacher autonomy on issues related to curriculum, instruction and assessment.

Key elements that appear to be needed for small schools to be effective include the following (Cotton, 2001; Darling-Hammond et al., 2002; Fine & Somerville, 1998):

- a **personalized environment** in which students and teachers develop strong, supportive relationships so that students feel cared about and teachers know their students;
- **autonomy** to control decisions about staffing (including the hiring of teachers), resource allocation, scheduling, and curriculum and instruction;
- a strong **focus on student learning**, with a coherent and purposeful curriculum, pedagogy that is adapted to students' needs, high, rigorous standards for all students, and support systems for students who need extra help to attain those standards;
- a **supportive environment** for teachers, in which teachers feel supported by their colleagues and administrators, can make key decisions about curriculum, instruction and assessment, have time to collaborate with each other, and are provided with ample opportunities for professional development;
- **accountability** focused on student achievement;
- and, for small schools located within large school buildings, **separateness and distinctiveness** so that students and teachers are able – both physically and psychologically - to closely identify with their small school.

Conclusion

Although conclusions concerning student achievement scores are still tentative, it appears that small schools, regardless of their structure (i.e., autonomous small schools, historically small

schools, theme-based or focus schools, etc.) can produce other positive results, especially for low-income and minority students. Whether or not small schools are effective, however, seems to depend more on the social and academic conditions that are created within the schools than on their absolute size.

Advocates of small schools suggest that the conditions needed to support quality teaching and learning are nearly impossible to create and sustain in large schools, particularly those with high concentrations of disadvantaged students. It is unclear from the literature whether this is true. It is also unclear whether the small school effects found thus far can be replicated on a large scale, especially given that many of the newly created small schools have benefited from selecting their teachers and students. To the extent that the advocates are correct and that selection effects account for only a portion of the reported benefits, then momentum in this country seems to be moving in the right direction.

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School Size

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