# Reducing the Negative Effects of Large Schools

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## *From Small to Large and Back*

The arrival of the baby boomers in the 1950s generated an unprecedented demand for classrooms and the search for educational excellence led influential thinkers like Harvard's James Bryant Conant to declare that high school enrollments needed to exceed a thousand students to support an honors track. America, after all, required more of the "best and the brightest" to win the Cold War. Small schools simply provided too few opportunities for gifted students.

Supporters of large schools got another boost in the 1960s as school districts were compelled to address desegregation. The larger the school, the more likely it would enroll a diverse student body. Small neighborhood schools began to disappear, in large measure because neighborhoods were slower to desegregate than school systems.

Fast-forward to the 21st century. Large schools no longer are regarded as the panacea for America's educational challenges. Many of the problems of public education, from low student achievement to high dropout rates, are being traced to large schools, especially high schools. In 2005, the 25 largest public high schools in the United States ranged in enrollment from 4,378 (at Robinson Secondary School in Fairfax County, Virginia) to 5,299 (at Belmont High School in Los Angeles).

Doubts about the ability of large high schools to provide the caring and assistance needed to ensure a quality education for urban youth led the Bill and Melinda Gates Foundation to initiate a massive program to support the downsizing of high schools. Aided by Gates money, a number of urban school systems, including New York City and Chicago, launched major campaigns to create smaller learning environments. The spread of charter schools and the proliferation of alternative schools and afternoon academies for students who failed to benefit from conventional school programs provided another springboard for downsizing.

## *Four Options for Creating Smaller Schools*

School systems wishing to reduce the negative impact of large schools have four basic options: renovate and redesign existing schools, reorganize and reallocate space in existing schools, utilize satellite facilities, and build new small schools.

### 1. Renovate and Redesign Existing Schools

Sometimes problems also present opportunities. The fact that many of America's school buildings require extensive modernization and renovation creates an opportunity to not only make needed improvements, but to redesign physical space to reduce the negative effects of size.

- **High schools** are subdivided into units with several designations. ***Houses*** are organized horizontally by grade level, such as a ninth grade house, or vertically, encompassing two or more grades. ***Academies*** often have a career focus and, in fact, may be referred to as "career academies." ***Schools-within-schools*** are small schools located within a host school. In many cases, houses and academies, and schools-within-schools have a distinct curricular focus. Each high school in Henrico County, Virginia, has a "center of excellence," a specialty school-within-school that draws students from other high schools as well as the host high school. ***Alternative schools*** are any freestanding school or school-within-school, but increasingly the term is associated with small schools for students who have

been suspended or expelled from a regular school, or who have experienced academic difficulties. A large high school may contain an alternative school, which may operate during regular school hours or as an after-school or evening program.

● **Middle schools** tend to be redesigned around ***pods*** or ***clusters***. Each pod or cluster contains classrooms for teachers of core subjects and, perhaps, a teacher workroom. A typical arrangement might involve four classrooms — English, social studies, science, and mathematics — all opening onto a common area or atrium. The four teachers in these classrooms function as a team, instructing the same group of 80 to 120 students and planning together. Students take additional subjects elsewhere in the school, but at least half of each day is spent in the same pod or cluster.

● **Elementary schools** may be subdivided into small groups of spaces. A ***family*** might cover the classrooms on one side of a corridor, including a kindergarten, first, second, third, fourth, and fifth grade class. When a group of students completes one grade, they move to the next room on their side of the corridor. The teachers in the family plan together and coordinate instructional activities. A ***neighborhood*** could encompass two families, or the classrooms on both sides of a corridor. Neighborhoods make it relatively easy for two teachers at the same grade level to coordinate activities, group and regroup students, and conduct joint lessons. Some elementary schools are designed around ***pods*** or ***clusters***, like middle schools. These units may be arranged to include classrooms at the same grade level or various grades.

## 2. Reorganize Existing Schools.

A second option involves reallocating space and reorganizing existing schools without undertaking any major changes in the physical structures. Because this strategy is relatively inexpensive compared to others, it has proved quite popular. When New York City undertook a major initiative in the late 1980s to create smaller high school learning environments, it decided to subdivide large high schools into houses and schools-within-schools without making major structural changes (Genevro, 1990; Public Education Association, 1989).

The initial focus of New York City's "house plan" was to create separate learning environments for ninth graders in the city's huge high schools. The ninth grade had been a source of problems for New York City educators, as it had been for educators across the nation. Behavior problems and absenteeism increase in ninth grade, retention is the highest for any grade level, and student achievement plummets. To address these problems, the New York City Board of Education endorsed the creation of more personalized learning environments for ninth graders.

### *Redesigning Chicago Schools*

The redesign of existing schools has taken several forms. Chicago, for example, has implemented three models (Wasley, et. al., 2000, pp 10-11).

A ***freestanding school***, like a conventional school, has its own space, budget, and principal. It can have its own building or be housed in a building with other freestanding schools. Chicago had 53 freestanding small schools in 2000.

A ***multiplex school*** houses a number of small schools in one building, each of which functions independently but under the same principal.

A ***school-within-school*** is a small school located within a large host school. It has its own mission and curricular focus, but it does not operate independently from the host school.

Renovating and redesigning existing schools typically involves secondary schools, but in Chicago's case a number of the downsizing projects involved elementary schools. In some cases, the small elementary schools contained two or three grade levels; in other cases, they covered kindergarten through fifth grade. One small school included kindergarten through eighth grade.

In a house plan, students, teachers, administrators, guidance personnel, support staff, and the school building itself are reorganized into small groups that people can identify with and feel a part of. Ideally, students take all or the majority of their classes within their house, a group they belong to by choice, not academic ability. (Public Education Association, 1989, p. 4).

New York City called for eventually expanding its house plan to include all high school students. When researchers from Bank Street College of Education studied the earliest efforts to develop houses, they found much to be encouraged about as well as some concerns. A major concern involved the lack of funds to redesign physical space to give each house a distinct identity and provide actual separation from other houses

(Public Education Association, 1989, p. 21). Since the early days of its House Plan, New York City school authorities have made a concerted effort to correct this problem. Where existing facilities have been reorganized into houses, the most popular approaches have been to designate corridors, wings, or floors for particular houses. These options may not always provide complete separation, but they offer a sense of common identity without major adjustments to the physical plant.

A related strategy, "right sizing," has been used in the Washington, D.C. public schools to modify, rather than close, schools in neighborhoods with declining populations of young people. Modifications may involve demolishing certain sections of existing schools or allocating part of the facilities for administrative functions, thereby effecting a reduction in school size.

## 3. Utilize Satellite Facilities

Danville, Virginia, was unable to build a new high school but it desperately needed to relieve pressure on overcrowded George Washington High School. Taking advantage of a nearby vacant junior high school, the school district encouraged teachers to propose "focus schools" that could be housed in the neighboring facility (Butin, 2000). Four focus school proposals were accepted, and in the fall of 1997 the Langston Focus School Center opened. Each of the four focus schools had a unique theme, ranging from global studies to business education. They opened with approximately 100 ninth graders each. For the next three years a new grade level was added each year as the original cohort moved up. The target enrollment for each focus school currently is 300 students.

A two-year study of Danville's focus schools found students were achieving at least as well as a matched sample at the main high school and that the retention rate was considerably higher (Butin, 2000). Truancy rates and discipline problems were lower. Overcrowding at the main high school was relieved and two additional focus schools were approved.

Utilizing a satellite facility presents some challenges. When it is not located on the same campus as the main high school, as in Danville, transporting students to and from school becomes more difficult. School administration increases in complexity, since the high school principal's office remains at the main high school. Danville appointed an on-site assistant principal to oversee the focus schools and coordinate activities with the main campus.

## 4. Build New Small Schools

A fourth option is to replace large schools with new schools that are smaller. While construction initially may be costlier than renovation, there are immediate benefits as well as possible long-term savings. Building new schools eliminates the problem of finding temporary placements for students during renovation and creates opportunities for bold educational initiatives that might be impossible in a renovated facility.

Consider the case of Franklin County, Virginia. Lacking support for a bond issue large enough to replace an overcrowded and outdated county middle school, district officials decided to build a new learning center to accommodate 500 students, roughly half the county's number of eighth and ninth graders (Duke, 1998b). They were determined to construct a facility that would provide young people with unique learning experiences — career-oriented projects that would engage students and help reduce the county's high dropout rate.

The result is the Center for Applied Technology and Career Exploration (CATCE), a nationally recognized educational facility and program that does not look or function like a conventional school. Designed to resemble a high-tech business, the 64,000- square-foot facility was created without a cafeteria, gymnasium, or library. CATCE consists of eight career centers, each with a large multipurpose conference room, a commons area, and administrative offices. Every student has access to a computer workstation. For exercise, students walk to a new YMCA, purposely located across the street from CATCE.

Franklin County eighth graders spend a semester at CATCE engaged in practical, hands-on projects, and a semester at the regular county middle school studying traditional subjects. To provide students with a more personalized learning environment, Franklin County challenged the belief that students must be housed in the same facility all year.

Other school systems may not be as imaginative as Franklin County, but they recognize the importance of small schools. A report by New York City's Public Education Association (1989) recommended that high schools should be designed for 500 to 1000 students. Excellent examples of such schools include Chicago's Northside College Prep (capacity 800) and Manassas Park High School (capacity 600) in northern Virginia.

When it is impossible to build a small school, planners should consider the multiplex or school-within-school models mentioned above.

## The Conversion of Julia Richman

To better understand what is involved in converting a large school into smaller units, consider a specific example. Julia Richman High School is located in New York City. Built in 1922, the massive five-story, U-shaped building and annex take up a city block. Over the years the physical plant deteriorated and the school's reputation declined. Julia Richman's graduation rate fell, vandalism and violence rose, and student pride in the school dropped.

To reverse this downward spiral, the New York City Board of Education chose Julia Richman as one of the first high schools to be reorganized into smaller units. The project took two years (1994 - 1996) to complete because provisions had to be made to graduate all students from the old Julia Richman High School before initiating a choice-based set of new schools.

The Julia Richman Complex, as it is now known, contains six schools, most enrolling approximately 300 students. The schools include:

- Vanguard High School. A typical high school course of study and organizational structure.
- Manhattan International School. Designed for students with limited fluency in English.
- Talent Unlimited Performing Arts High School. A specialty school that also offers basic courses.
- Urban Academy. A high school for transfer students that is organized around multiage classes.
- P226M. A special education junior high school designed for severely autistic children.
- Ella Baker Elementary School. An elementary school for children of employees of hospitals in the neighborhood.

Most of the schools occupy their own floor. The Urban Academy is housed in the annex. In addition to the six schools, Julia Richman has several gymnasiums, a library, common science lab, a cafeteria, and a health clinic serving all students. When they are not using these facilities, students remain in their separate schools. Double doors separate each school from common areas, and students do not walk through one school to get to their own school. A pedestrian bridge connects the annex to the main building. To cut down on congestion, starting and dismissal times for each school are staggered.

Students in Julia Richman's schools take full advantage of the complex's location in the midst of an urban area. Those who need to take Advanced Placement courses do so by attending classes in local community colleges. Every Wednesday afternoon, students leave school to perform community service while their teachers plan together and schedule meetings.

Students at Julia Richman develop a strong loyalty to their particular school. To enhance the feeling of separateness, each school operates as an independent entity, with its own principal, assistant principal, and two counselors. Each school has its own administrative offices and workrooms. To supplement the common science lab on the fifth floor, schools are equipped with lab tables on wheels so that any classroom can become a temporary laboratory.

The Julia Richman Complex was created without a major investment in redesign. While the basic floor plan was left unaltered, a few large classrooms were subdivided by adding walls. Each school was provided with its own entrance, offices, and storage rooms. The heating and electrical systems had to be rewired and upgraded. Air conditioning was added and two greenhouses were installed on the roof. Asbestos abatement measures were taken in several areas, such as the new dance studio, where old flooring had to be removed. The gymnasiums and library were renovated. A number of cosmetic touches were undertaken, including painting, refurbishing restrooms, and providing new window treatments. The $2.5 million price tag was relatively low because the work was done in-house.

## The Case for Small Schools

Various arguments can be advanced in defense of small schools. A study of Chicago's efforts to promote small schools, conducted by a research team from Bank Street College of Education (Wasley et al., 2000, p. 2), identified four primary reasons.

Why create small schools? Above all, in to address four specific problems: the need for small, intimate learning communities where students are well known and can be pushed and encouraged by adults who care for and about them; to reduce the isolation that too often seeds

alienation and violence; to reduce devastating discrepancies in the achievement gap that plague poorer children and, too often, children of color; and to encourage teachers to use their intelligence and experience to help students succeed.

Additional reasons include improved school safety and security (Duke, 2002) and better coordination among staff members (Fowler & Walberg, 1991).

Is there evidence to support these arguments for small schools? The answer is yes.

One of the first systematic studies to report the benefits of small school size was Barker and Gump's *Big School, Small School*. Among their intriguing findings was the fact that students in small schools were more likely to participate in school-sponsored activities than their large school counterparts, even though large schools tended to offer more activities. In a comprehensive review of 103 studies of school size, Cotton (1996) noted, among other positive findings, that students in small schools viewed particular subjects and school in general more positively.

Some of the evidence comes in the form of testimonials from individual schools. As a result of being subdivided into houses, New York City's Dewitt Clinton High School, for example, went from being one of America's largest and most troubled high schools to one of President Clinton's 96 outstanding high schools (Lakhman, 1999). Between 1988, when New York City launched Project Achieve to help struggling high schools, and 1998, Dewitt Clinton raised average daily attendance by over 17%, reduced the dropout rate by 8 .5%, and increased the on-time graduation rate by almost 50%. Between 1993 and 1998, enrollment in Advanced Placement courses jumped from 131 to 553 and the number of Regents exams that were passed rose from 1,311 to 3,228.

Granby High School in Norfolk, Virginia, is another success story. After an extensive renovation that included subdividing the venerable local landmark into four academies, Granby began to re-attract students who had withdrawn to go to private schools (Schnitzer & Caprio, 1999). Disciplinary referrals dropped substantially and students reported receiving more individual attention from teachers and other staff members.

Several large-scale studies reinforce the positive experiences at Clinton and Granby. An investigation of school size effects in 293 New Jersey public secondary schools found that, next to district socioeconomic status and the percentage of students from low-income families, school size was the best predictor of student achievement on state tests (Fowler & Walberg, 1991). Students in smaller schools, regardless of socioeconomic status, tended to do better on state tests.

Researchers for the Rural School and Community Trust looked at 13,000 schools in Georgia, Montana, Ohio, and Texas and found that smaller schools consistently outperformed larger schools (Keller 2000). Perhaps most important, smaller schools posted higher scores on standardized tests than would have been predicted from their poverty levels alone. In other words, the negative effects of poverty are reduced in smaller schools.

In a unique study of the impact of school size, Lee (2001, 126-143) focused on 12$^{th}$ graders in 789 public, Catholic, and elite private high schools. The large majority of schools were public. All of the students attended the same high school between 10$^{th}$ and 12$^{th}$ grade. The effects of school size were evaluated in terms of student performance in reading and mathematics. High schools were clustered into eight groups based on enrollment: less than 300 students, 300 to 600, 601 to 900, 901 to 1,200, 1201 to 1,500, 1,501 to 1,800, 1,801 to 2,100, and over 2,100. Student achievement effects were measured against the modal size for an American high school – 1,200 to 1,500. Lee's analysis indicated that the optimal size for a high school was between 601 and 900 students. Achievement gains were lowest for students in schools over 2,100 students, but they were nearly as low for students enrolled in schools under 300.

Until recently, most of the large-scale research on small schools focused on schools in general, not schools that were intentionally designed to be small. In a study conducted in Arkansas in 2002 (Johnson, Howley, & Howley), the interaction between achievement, poverty, and school and district size yielded findings that may possibly contribute to eliminating the achievement gap between rich and poor students. The researchers found that the higher the level of poverty in the community served by the school, the more damage larger schools and school districts inflicted on student achievement. The study also found that the achievement gap between students from rich and poor communities narrowed in smaller schools and smaller schools were most effective against poverty when located in smaller districts. In direct contravention to the prevailing notion that consolidation of smaller schools and districts invariably leads to better outcomes for students, the authors noted:

This study clearly shows that trying to save money through consolidation of either schools or districts would predictably have the perverse effect of actually widening the achievement gap and worsening the inequities of Arkansas education (Johnson, et. al., p.11).

Another study in North Dakota further documented the positive effect of small schools on student achievement. The researcher divided all high schools in the state into five categories based upon the size of the student population and averaged the reading and mathematics test scores posted on the state Department of Public Instruction website. In both reading and math, the mean of student achievement was higher in smaller schools than it was in the state's largest high schools (for the purposes of the study, those enrolling a population > 500.) Furthermore, in contrast to standard images of big-city poverty and the complex social issues that impact more urbanized states, students enrolled in the smaller high schools in the study were eligible for free or reduced-price lunch at higher rates *yet still outperformed their peers* attending larger high schools in North Dakota's biggest cities. The author affirmed that, "The data shows definitively that there is simply no possible academic rationale for forcing the closure of small schools; if anything, it is the large schools that should face pressure to close" (p. 39).

With the advent of comprehensive downsizing initiatives in Chicago and New York City, the opportunity exists to investigate the impact not only of schools that happen to be small, but also schools that are purposely created to be small.

● ***Chicago***. In 1988 the Chicago School Reform Act initiated a massive effort to restructure school governance and redesign schools in a school system reputed to be one of the worst in the nation. More than 150 small elementary and secondary schools were created, some as a result of new construction and others by virtue of sub-dividing large schools. When Bank Street College of Education researchers studied many of these small schools, they found evidence of improved student achievement, attendance, and persistence (Wasley, et. al., 2000). Parents, teachers, students, and community members reported high levels of satisfaction with small schools.

Confirmation of the Bank Street study comes from another study of Chicago schools. Lee and Loeb (2000) investigated the relationship between school size and two outcomes: teachers' attitudes about their responsibility for student learning and students' gains in mathematics achievement over a one-year period. Data from 264 K-8 schools revealed that schools enrolling fewer than 400 students were characterized by more positive teacher attitudes and higher student achievement.

Based in part on encouraging findings from these earlier studies, Chicago Public Schools, with assistance from the Bill and Melinda Gates Foundation, launched the Chicago High School Reform Initiative (CHSRI) in 2001. By the fall of 2005, the CHSRI had opened 23 small high schools by converting large high schools into several smaller entities.

In order to assess the impact of the CHSRI, a team of researchers (Kahne, Sporte, de la Torre, & Easton, 2008) compared 11$^{th}$ graders in other Chicago high schools. They found that students perceived small schools to be more supportive environments. This fact probably contributed to somewhat higher attendance rates and lower dropout rates at the conversion schools. The researchers also investigated the impact of conversions on teachers. While teaching in a small school was found to be associated with greater teacher collegiality, influence, and collective responsibility, no evidence was found that teachers adopted improved methods of instruction.

● ***New York City***. Between September 2002 and September 2005, the New York City Department of Education opened 162 new small secondary schools, tripling the number of public secondary schools (Foley, Klinge, & Reisner, 2007). Supplemental support for this initiative came from various foundations, including the Bill and Melinda Gates Foundation. Leadership and technical support for 75 of the startups was provided by New Visions for Public Schools (NVPS). The 75 schools were known as the New Century High Schools (NCHS). An evaluation of the NCHS, completed in 2007, provided the first assessment of the impact of the New York City initiative (Foley, Klinge, & Reisner, 2007).

The primary indicator of success used by evaluators was the percentage of students in the Class of 2006 who graduated from high school on time. The NCHS graduated 20% more students than larger New York City high schools (78.2% versus 58.2%). About 17% of comparison-group students dropped out, while only 3% of NCHS students left school before graduating. These impressive results are moderated by the fact that comparison-group students were more likely than NCHS students to earn a Regents or Advanced Regents diploma (67% versus 45%). NCHS students boasted

higher rates of school attendance and promotion than comparison-group students, but they also were suspended more often. NCHS schools enrolled larger percentages of poor students and students with lower eighth grade test scores than comparison-group schools.

A unique study conducted in 2008 by researchers at New York University cast light on the relative cost of educating students in small New York City high schools (Steifel, et al., 2008). Drawing on nine years of data from over 200 New York City high schools, ranging in size from under 300 to over 2,000 students, the study is one of the most sophisticated of its kind attempted to date. The central finding is that the cost of educating students cannot be separated from the type of small school. Small schools that focus on a particular theme, such as science or the performing arts, are less costly on a per pupil basis than comprehensive high schools, regardless of whether they are large or small. In speculating on why small themed schools are less expensive to operate, the researchers reasoned that they have a narrower set of course offerings and fewer Advanced Placement courses. "The results suggest that for themed schools, costs per pupil decline with enrollment and are at their lowest at roughly 500 students" (Steifel, et al., 2008, p. 3). Furthermore the authors noted, "Given that themed schools enroll students who are more difficult to educate, it is all the more impressive that themed small schools approach the costs of comprehensive schools at a certain point" (p. 29).

## *Other Benefits of Small Schools*

Besides promising findings from Chicago and New York City, there have been a number of other indicators that downsizing large schools can yield benefits for students and teachers. In *High Schools on a Human Scale*, Toch (2003) provides detailed descriptions of five small high schools including the aforementioned Julia Richman Education Complex. Each school emphasizes the importance of interpersonal relations, individualized attention, and lots of extra help for struggling students. Toch (2003, p. 13) concludes that smaller schools "encourage stronger bonds between students and teachers and generate a level of genuine caring and mutual obligation between them that's found far less frequently in comprehensive high schools."

The Bill and Melinda Gates Foundation commissioned a study of newly constructed small high schools and high school conversions funded by its grants to four large school systems (Smerdon & Means, 2005a; Smerdon & Means, 2005b). Both the new and the conversion schools enrolled higher proportions of poor and minority students than did the large comprehensive high schools with which they were compared. In two districts, students in the small schools experienced larger improvements in English/reading than comparison-group students. Interestingly, some differences were found between student outcomes in newly constructed small schools and high school conversions. Attendance rates, for example, were higher at newly constructed small schools than at conversion schools. Compared to their previous status as large comprehensive high schools, the conversion schools showed gains "in their implementation of personalized school cultures in which students feel known and supported by their teachers, both academically and personally" (Smerdon & Means, 2005a, p. 59).

Some of the emerging evidence supporting small schools is not based exclusively on newly constructed small schools and high school conversions. Jay Mathews (2008), for example, looks at all public high schools each year and ranks them based on the number of Advanced Placement, International Baccalaureate, and Cambridge tests taken by students divided by the number of graduating seniors. In 2007 only 3 of the top 100 schools had graduating classes smaller than 100 students. A year later, there were 22 small schools in the top 100.

Several recent publications have focused on the fact that small schools tend to be safer environments for students. Klonsky (2002) notes that small schools benefit from three factors: 1) students are more visible, 2) teachers tend to function more like a community, and 3) the schools are characterized by a greater sense of purpose. Hill and Christenson (2007) found that teachers in urban schools enrolling 200 – 749 students were less likely than their counterparts in larger schools to report daily, weekly, or monthly incidents of robbery, theft, vandalism, verbal abuse, or use of illegal drugs or alcohol.

## *The Cost Effectiveness of Small Schools*

The question of scaling up small schools in the 21st century invariably leads to the notion of cost effectiveness. The conclusions of studies conducted in the latter half of the 20th century support the cost

effectiveness of larger schools; serving a greater student population yields economies of scale appreciated by taxpayers. Yet reframing the notion of cost effectiveness to consider the output of a successful public education system, (i.e. number of four-year graduates), prompts rethinking regarding educational expenses. The higher graduation rates of smaller schools in both rural and urban communities are convincing more scholars and public officials that the traditional arguments of economies of scale needlessly constrain broader and more logical notions of the purposes and products of public schools.

Findings from reports produced in Vermont and Nebraska have eschewed the traditional constructs of cost per pupil and economies of scale and homed in on the achievement levels of students and a new metric known as *budget per graduate*. Despite raw numbers that reflect a slightly higher cost per pupil, a study by the Vermont Department of Education (1998) included recommendations to forego school consolidation and maintain existing smaller schools. While the cost to educate a pupil in the state is higher in smaller schools (by an average of 6 – 12%, with a high of 18% in schools with a population below 50), the study noted that on fourth grade exams administered in reading and math, "Students in small Vermont schools do as well or better than students in larger schools even though the income and education levels in the communities with small schools are *lower*" (p. 5).

In the study conducted in Nebraska, Funk & Bailey (1999) considered the crucial metric of on-time graduation. The higher percentages of students graduating within four years at smaller high schools (population below 600) prompted their investigation. Small schools, despite the slightly higher cost per pupil, demonstrated an overall cost effectiveness due to the greater percentage of on-time graduates. The study conducted in Nebraska also focused on the issue of school consolidation and elimination of smaller schools. The investigators highlighted data showing higher graduation rates as well as higher rates of matriculation in post-secondary instruction by students attending Nebraska's smaller high schools. They used these successful outcomes to challenge the traditional assumption of an optimal school size based solely upon economies of scale. The authors noted:

Any higher school finance costs associated with small schools virtually disappear when the substantial social costs of non-graduates and the positive societal impact of college-educated citizens are considered (p. 4).

Given the sustained success of the critical mass of small schools established in New York City during the late 1980s and early 1990s, researchers at New York University (Stiefel, Berne, Iatarola, & Fruchter, 2000) sought to determine the feasibility of scaling up the strategy. 121 high schools in New York City were divided into small (<600), medium (600 – 1,200), and large (>2,000) populations. The researchers calculated that the average budget per graduate of a traditional comprehensive high school (population > 2,000) was $49,967 while the average budget per graduate of a student attending an "academic and articulated alternative" small school (a school designed to serve a traditional population, requiring no exceptional support services, and with a population <600) was $51, 876. Both iterations of school design proved to be the most cost effective of all options existing in New York City at the time of the study and continue to be so in the present day.

Lawrence, et. al., (2002) used figures from a database of 489 school facilities projects undertaken between 1990 and 2001 to demonstrate that smaller schools were not prohibitively expensive and could be built cost-effectively. The authors noted:

> Comparing the cost of construction for all the schools in the database, the cost per student to build smaller schools is about twenty percent higher ($15,709 versus $ 12,977) than the cost to build larger schools. The cost of $5.00 more per square foot, however, is only about five percent higher ($109 versus $104) (p. 19).

Moreover, the researchers examined a subset (n=145) of the schools that they deemed to be more "reasonably sized" (population <1,000) than traditional "mega-schools" and calculated costs in square footage. These reasonably sized schools were divided into smaller and larger groups for elementary, middle and high school. Based on calculations of cost per square foot and cost per student, the authors concluded that the smaller of the "reasonably sized" schools were less expensive to build than the larger of the "reasonably sized" schools due to the inclusion of more grades in the smaller schools as well as slightly fewer square feet (151 to 161) allocated per student. The final conclusion emphasized that smaller schools were not prohibitively expensive and that smaller schools could even be more cost effective when "mega-schools" were eliminated as an option. But even in comparison with "mega-schools," the cost of constructing smaller schools was only marginally higher.

## *The Downside of Downsizing*

Small schools, like many influential reforms, yield unexpected rewards and unexpected challenges. For small schools, the foundational component of providing exceptional service to underserved students has sometimes been adversely affected by the lack of specialized professional staff. The lack of adequate space in urban communities also has influenced the success of the reform. This section describes these two unanticipated challenges experienced by the practitioners of small schools as well as remedies that have been attempted to ameliorate circumstances antithetical to the mission of small schools.

Contemporary small schools strive to provide the quality education traditionally reserved for a select portion of America's student to historically underserved students in urban communities. Yet the question has arisen as to whether certain historically underserved populations, including special education students and students with limited English proficiency, are receiving equal access to the limited space available in today's successful small schools.

***Challenges with exceptional populations.*** In 2006, David Bloomfield, a professor of law and education at Brooklyn College, filed a complaint with the federal government on behalf of New York City's Citywide Council on High Schools. The complaint alleged that the New York City Department of Education discriminated against special education students and students with limited English proficiency by denying them spots in the city's new small middle and high schools. Officials in the administration of Michael Bloomberg, who has made the scaling up of small schools a central initiative during his tenure as mayor, confirmed that smaller schools generally have fewer special education and limited English proficient students when first opened, but he went on to note that the schools eventually catch up to conventional enrollment percentages. In their defense, New York City officials also noted that new small schools have demonstrated greater success with the special needs students that have enrolled, despite their proportionally lower numbers. In the 2005-2006 school year, 74% of students in special education were promoted from ninth to tenth grade in small schools, compared with 59% in traditional high schools (Samuels, 2007).

The stated goal of the Bloomberg administration and Schools Chancellor Joel I. Klein is for the enrollment of small schools to reflect the citywide averages in special education and limited English proficiency by their third year of existence. In the 2004-2005 school year, 5.6 % of students at small schools were eligible for special education services versus 10.3% at traditional high schools (Gootman, 2006). By 2007-2008, the percentage of incoming students with special needs had increased considerably and approached 10% of total enrollment. Robert Hughes, the president of New Visions for Public Schools, a nonprofit group that has helped shaped much of the city's small schools, noted the lack of a "formal exclusionary policy," (Gootman, 2006) and went on to share that small schools simply do not have sufficient resources in their early years to fully serve students with special needs. Advocates of special needs students view the situation as a violation of civil law and oppose the official Department of Education policy cited in Samuels (2007):

> For their first two years, small schools are not required to offer special education services for students who require classes co-taught by a special education and regular teacher, or instruction in "self-contained" classrooms of special-needs students. From the start, however, they must serve students who can function in a classroom with additional support part of the day from a special education teacher (Samuels, p. 10).

Prior to the 2007-2008 academic year, in a formal measure undertaken to square the imbalance, New York City offered grants to ten small schools to encourage efforts to enroll higher percentages of special education and limited English proficient students. The ten small schools used grants of up to $45,000 a year for two years to hire a lead special education teacher. A second group of ten received $45,000 for one year to hire an extra teacher certified in teaching limited English proficient learners. Critics still cited the size of the program as insufficient and stressed the wisdom of crafting an initiative from the outset that is congruent with current civil rights policies (Samuels, 2007).

Recently, Duke & Duke (2006) have also argued for the creation of more inclusive small schools. They see a natural fit between inclusive educational settings and the contemporary small schools movement and describe the interconnection as, "a necessary progression of the small schools movement" (p. 7). They specify twelve possible benefits of connecting the mission of small schools with expanding notions of inclusiveness for students with disabilities. These benefits include access to different learning communities, higher quality instruction, and increased student achievement.

***Challenges with space and numbers.*** An unintended consequence of the pace and intensity of scaling up small schools in both New York City and Chicago has been the displacement of students attending traditional schools designated for conversion or reconstitution. Many large high schools that undergo conversion into small, autonomous schools are ultimately unable to handle the size of the existing student population after reorganization. The reassignment of "leftover" students has resulted in effectively "dumping" them into traditional neighboring schools and the unanticipated influxes have exacerbated issues of overcrowding in receiving schools. Particularly burdensome has been the inflow of clusters of special-needs students; existing schools that are already overcrowded are simply unprepared to meet the wide-ranging needs of a greater special-needs population. Some traditional schools on the receiving end of "leftover" students have reported increased levels of violence and higher suspension rates (Herszenhorn, 2005).

In Chicago, eight traditional schools that were required to accept students displaced during Mayor Richard M. Daley's Renaissance 2010 initiative (a program begun in 2004 with the goal of creating 100 small schools by the end of the decade) posted increases in reported violence that were at least twice the average for similar city high schools. The result of this unintended ripple effect was a backlash against not only the speed and intensity of the small schools scale-up but the entire notion of reorganizing failing schools through reconstitution. The Chicago Teachers Union stressed the elevated incidents of violence in its criticism of Renaissance 2010. Moreover, a member of the Chicago City Council sought a moratorium on further school reorganizations until an evaluation of the academic progress of all students whose schools were closed or reconstituted took place. In March 2006, the Illinois State Legislature passed a bill requiring greater public review before the Chicago Public Schools could close and reconstitute an existing school (Robelen, 2006).

***Student Achievement.*** As the 2000's unfolded, contemporary small schools frequently outpaced their district counterparts in conventional metrics used to gauge the performance of public schools. Compared to traditional schools in their respective communities, small schools have produced higher attendance rates, higher graduation rates, higher rates of matriculation in post-secondary instruction, lower dropout rates, and reduced absenteeism (Levine, 2002; Meier, 2002.) Yet the outcomes for a critical component of current school reform, increased student achievement, have been mixed. Results indicate that student achievement is not always higher in small schools and while there is some evidence of marked improvement in certain schools, it remains inconsistent across communities with a critical mass of small schools.

The Center for Collaborative Education is a non-profit advocacy organization that promotes small schools in Boston, MA. In a study conducted by the CCE and reviewed by independent researchers, data collected from the Massachusetts Comprehensive Assessment System in the 2003-2004 school year and recorded in the Massachusetts Department of Education's Student Information Management System (SIMS) indicated higher levels of achievement for students enrolled in the Pilot Schools (Boston's cadre of 19 small schools) than for students enrolled in traditional Boston Public Schools. Table 1 illustrates these results:

**Table 1**
Contrasting Scores between Pilot Schools and Traditional Boston Public Schools from MCAS Administration- School Year 2003-2004

| Grade Level | Subject | Pilot Schools | | Boston Public Schools | |
|---|---|---|---|---|---|
| | | Advanced/ Proficient | Passing | Advanced/ Proficient | Passing |
| 3rd | Reading | 68% | 96% | 34% | 80% |
| 4th | ELA | 46% | 77% | 29% | 74% |
| 4th | Math | 37% | 71% | 21% | 68% |
| 6th | Math | 38% | 69% | 17% | 46% |
| 7th | ELA | 48% | 87% | 36% | 80% |
| 8th | Math | 26% | 54% | 12% | 43% |
| 10th | ELA | 36% | 84% | 17% | 58% |
| 10th | Math | 33% | 80% | 24% | 59% |

In a similar study, Kahne, et al., (2008) compared the achievement scores of eleven schools in the Chicago High School Redesign Initiative (CHSRI) with Chicago's non-alternative high schools. In this study, the researchers found *no difference* in achievement on the PSAE (Prairie State Achievement Exam) between students attending traditional high schools and students attending CHSRI high schools over a four-year period. The researchers noted the following for all but one of the years in which data was collected:

> Achievement among 11th graders, as measured on the statewide standardized achievement tests in math and reading (the PSAE), was no different for students attending CHRSRI [Chicago High School Redesign Initiative] high schools than for similar students at otherwise similar schools (p. 295) … In 2005-2006, there was a marginally significant difference for the

> reading test ... However, the size of the difference was less than a point (p. 295).

Wainer and Zwerling (2006) plotted the mean scores of fifth grade students from 1,662 contributing schools in the state of Pennsylvania and analyzed the regression line. They noted the overrepresentation of smaller schools by several factors in both the highest performing and the lowest performing groups.

***Teacher Retention*.** The issue of teacher retention has long bedeviled public education. Yet little examination of the topic has been undertaken within the context of contemporary small schools. Might the challenge of retaining teachers be exacerbated by the dynamics of small schools? Teachers in small schools manage multiple roles; they teach, advise, tutor, mentor, perform administrative duties and can serve as a stabilizing force in the lives of students that come from disadvantaged backgrounds. It is a time-consuming venture, often requiring that teachers monitor students' activities on the weekend and during the summer in order to derive the full benefits of the relationships that underpin the small schools enterprise. Administrators in small schools and charter schools, including Boston's Pilot Schools and the KIPP schools, have devised strategies to counteract the especially rigorous intellectual and emotional environment. These strategies include clear communication of heightened expectations for teachers during recruitment periods and permission for some teachers to cut back on hours while remaining with the organization. The composition of small schools is unique and numerous educators expressed opinions about the acute challenges that are faced, suggesting administrators and policymakers closely monitor teacher burnout and institute mechanisms to ensure a steady stream of teachers prepared to contribute to this unique educational environment (Keller, 2007).

## *Key Questions*

***1. Who are the intended beneficiaries of smaller schools?*** Planners must determine whether they want to create smaller learning environments for all students or only some students. While many projects involve subdividing schools into houses or other small units for all students, other projects are based on designing small units just for one group, such as ninth graders or at-risk students. While small learning environments may be advantageous for all students, they may be particularly beneficial or even essential for certain individuals. The latter group may include young people in need of considerable assistance to overcome academic deficits and those who require constant supervision and a great deal of structure.

***2. What Is the Best Way to Reduce the Negative Effects of School Size?*** Deciding how to create small learning environments is a matter of weighing the alternatives against available resources, time constraints, and local politics. On occasion, for example, construction of a new high school to relieve overcrowding may be squelched because influential citizens do not want to distill the power of a local athletic program.

The major options that were presented earlier in this paper include building a small school from scratch, utilizing a satellite facility, reorganizing the space in an existing school, and completely renovating and redesigning an existing school. In the short run, the second and third options probably are the least expensive, but they are not necessarily long-term solutions. Satellite facilities also may require renovation and redesign.

In some cases, local politics will not permit the abandonment of an older facility. When the Norfolk City School District faced a decision regarding the future of Granby High School, it considered building four small high schools in place of the large, but outdated facility (Schnitzer & Caprio, 1999). District officials soon realized that Granby was too important a part of the city's history to abandon or destroy. The decision was made to create four academies at Granby and, in the process, renovate the existing facility as well as add additional space. The entire project, completed in 1998, ran approximately $25 million.

Time constraints, as well as politics, can influence the decision on how best to downsize. If one of the central issues is the need to relieve overcrowding, as was the case in Danville, the bet option initially may be to utilize a satellite facility. It takes considerable time to plan a new school or renovate an existing facility.

***3. What is the Best Organizational Structure for the Project?*** Planners must decide the type of small units into which a large facility will be subdivided. The options include houses, academies, focus schools, charter schools, schools-within-schools, centers, clusters, team-based pods, classroom families and neighborhoods, and alternative schools and programs. Some options represent autonomous units that share a common

facility. Other options represent units of the same school, each subject to the authority of the same principal. Determining the most appropriate structure requires a consideration of financial arrangements, the mission of each nit, and the extent to which key services and spaces must be shared. It makes little sense to create supposedly autonomous units, for example, if they are expected to share the same mission and support services and they lack an independent budget. There are advantages, of course, to independence. Units that enjoy a high degree of autonomy are more likely to generate a unique culture and an inspired commitment to the success of the program.

Upon what basis should units be formed? Units may be constituted in various ways, depending on their purpose. One choice involves the grade level of students. Some houses, for example, are intended only for ninth graders, in order to ease the transition from middle school to high school. Other houses are purposely designed to accommodate students from different grades. In this arrangement, students spend several years in the same house, as they advance from one grade to another.

A second basis for forming small units concerns the means by which students are admitted. Do students choose their unit or are they assigned? Access, in turn, is related to a third basis for unit formation – curricular theme, such as science and technology or health-related careers. When units have a specialization, students must be free to choose the one that they will attend. In other cases, random assignments may make the most sense. In the case of alternative schools for students who have been suspended or expelled, access typically is based on administrative assignment.

The issue of access to units is not without political consequences. Some critics of small schools fear that they provide an opportunity for de facto segregation. They believe that students who are free to choose their small school will do so in a way that undermines the goal of social integration. Since large schools have not always avoided de facto segregation, however, this argument may need to be reconsidered.

What design features are needed to facilitate the creation of small learning environments? Once the preceding questions have been addressed, it is necessary to consider how physical space can be arranged to enhance the downsizing project. As Goodlad (1984, p. 310) has written, “Most existing buildings lend themselves poorly to providing some spatial identity for each school…” He went on to state, “Ideally, some internal reconstruction should accompany the recommended reorganization.” In most cases, reorganization requires a balance be struck between separate facilities and shared facilities.

When small units constitute separate schools with their own curricular focus and administration, it is important for each to have a distinct physical identity. Design features such as separate entrances and administrative offices, separate classrooms, unique color schemes and decorations, and a separate commons area or gathering place for students are helpful. Each unit should have, to the extent possible, its own circulation pattern. Staggered class schedules may facilitate this objective when the physical space does not permit completely separate traffic patterns to and from class.

Many large schools that have been subdivided into small autonomous or semi-autonomous units retain a common cafeteria, gymnasium, library/media center, and clinic. When Granby High School in Norfolk, Virginia, was redesigned, the four academies shared a commons area that doubled as a cafeteria. Around the commons were facilities housing a career resource center, a student activities room, a health clinic, an attendance office, and a security office (Schnitzer & Caprio, 1999, p. 47).

Staggered scheduling may make it possible for students from different units to each lunch and exercise without overlapping, if planners do not desire such commingling. If each unit has adequate technology, students can access many library resources through the Internet, thereby reducing the need to visit the library/media center.

When units have distinct curricular and career themes, each may require special facilities. A school-within-school devoted to environmental science may require special laboratories and greenhouses. An arts academy may need studios with ample natural light, small stages, rooms for individual music lessons, and considerable space for the storage and display of projects. A health careers focus school may include a working clinic stocked with appropriate equipment.

What problems may occur as a result of subdividing a large school into small unit? An obvious problem to watch out for is friction between units. Such friction may result from various causes, ranging from misguided loyalty to competition for scarce space and resources. When different units must share certain spaces, it is helpful to designate one individual as the coordinator of facilities. This person should develop and enforce

guidelines for requests to use common areas. It also may be useful to form a steering committee, consisting of representatives from each nit, to handle issues of common concern.

Another potential problem relates to shifting enrollment patterns. When small schools located at the same site are accessible by choice, enrollments can be expected to fluctuate. Such fluctuations may mean that, from time to time, some schools will need more space and other schools will need less space. A mechanism must be worked out for handling such adjustments in a fair and tension-reducing way.

Those who subdivide large schools that are overcrowded need to realize that subdivision is not a cure for overcrowding. Unless square footage is increased as a result of renovation, or some students are reassigned to other facilities, the overcrowding that plagued the large school will get passed on to the subdivided facility. The only relief that may be expected under such circumstances is that problems resulting from overcrowding may be handled more effectively by small units. Still, it is preferable not to tax building capacity when introducing small units.

## *Recognizing Success*

By what yardstick can educators determine whether a project to reduce the negative effects of school size has succeeded? The answer, of course, depends on the specific goals of the project. In general, though, small schools are built and large schools are subdivided to:

1. facilitate a more caring and supportive school culture
2. reduce feelings of alienation and anonymity that can lead students to drop out.
3. improve student academic achievement.
4. reduce behavior and attendance problems.
5. increase cooperation among teachers.
6. permit teachers to deal with the special concerns of a particular group of students.
7. permit students to focus on a particular and specialized course of study.

Some indicators of success may apply to several of these seven purposes, while others are specific to one purpose. Improved attendance, for example, suggests success not just for purpose 4 but for purposes 1 and 2 as well. It is important for planners to determine the criteria by which they will judge success before they implement their downsizing project. Some possible indicators of success related to one or more of the seven reasons are:

- improve grades and grade point average
- improved scores of standardized tests
- improved quality of student projects
- greater student commitment to completing school
- improved student attendance
- reduced disciplinary referrals, suspensions, and expulsions
- better relationships between students and teachers
- faster intervention when students experience academic difficulties
- greater student participation in lessons and other instructional activities
- greater student interest in school
- greater student interest in a career
- reduced teacher turnover
- greater cooperation among teachers
- lower student retention at grade-level
- higher graduation rates
- lower dropout rates
- increased parental involvement and school/home communication

Under certain circumstances, it is conceivable that small schools will produce mixed outcomes. For example, attendance may improve while grades in a particular subject drop slightly. In such cases, stakeholders must consider whether the benefits of downsizing outweigh the costs. Based on the current research on small schools, though, it is reasonable to expect more benefits than costs will result from efforts to create smaller learning environments.

## *Conclusion*

Nearly twenty years after the decision of some large urban school districts to vigorously pursue small schools reform, is it reasonable to characterize the overall impact of contemporary small schools? Like many reform initiatives, small schools returned some positive results in anticipated areas as well as some in unexpected areas. Yet small schools have also produced their share of disappointments. Tables 2 and 3 summarize the findings thus far.

While there is no reason to believe that small schools are a panacea for all the challenges facing public education today, there is also no reason to discount them as one of a variety of strategies for addressing the needs of students, including some students who have failed to thrive in conventional learning environments. Small schools may not yet have demonstrated a consistent capacity for out-performing large schools in terms of student performance on standardized tests, but they have begun to post a track record for keeping students in school long enough to graduate.

**Table 2**
Financial Costs/Benefits of Downsizing

| Item | Clear Cost | Clear Benefit |
|---|---|---|
| Higher per student expenditure | X | |
| Cost effectiveness of budget per graduate | | X |
| Enhanced autonomy for faculty to allocate resources | | X |

**Table 3**
Non-Financial Costs/Benefits of Downsizing

| Item | Clear Cost | Mixed Results | Clear Benefit |
|---|---|---|---|
| Faculty collaboration | | | X |
| Personalized learning and working environment | | | X |
| Teacher ownership | | | X |
| Autonomy and freedom from the "central office" | | | X |
| Fewer elective course offerings | X | | |
| Few subject area specialists on staff (e.g. licensed art & music teachers) | X | | |
| Higher attendance rates | | | X |
| Higher graduation rates | | | X |
| Higher rates of matriculation in post-secondary instruction | | | X |
| Lower rates of violence | | | X |
| Student achievement on standardized tests | | X | |

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***Additional Information***

See the NCEF resource list School Size online at http://www.ncef.org/rl/size.cfm

***Publication Notes***

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