

Pennsylvania School Boards Association



ES&PSM

School Building Size



Is there a right size?

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School Building Size Is there a right size?

Executive Summary

PSBA's look at school size regarded research and data related to the topic from the last half century. While there is ample advocacy-based and research-grounded literature addressing the question of appropriate school size for elementary and secondary schools, it seems unfortunately there are no definitive studies indicating exactly how large or small a school building should be in order to most appropriately meet the needs of all students. In fact, there is not even consensus on what is small, and what is big. Searching for an answer to the question of "What is a small school?" yields differing results regarding both enrollment numbers and desired outcomes. Suggestions for elementary school enrollment numbers range from around 200-300 students as an upper limit, while in secondary schools the suggested upper limit varies among small schools advocates from 600-900 students per building. Most research seems in agreement that buildings with more than 900-1000 stu-

Average enrollment in America's schools has been growing for the past 60 years or more, posting a 13% rate of growth for high school buildings, and a 15% rate of growth for elementary buildings

dents should be considered large, and that appropriate size is an enrollment number that will vary from building to building and district to district.

A move toward consolidation of school districts and construction of larger school facilities that arose in response to multiple social factors through the 20th century eventually rested upon cost savings as a result of economies of scale, and availability of diversified curricula in larger learning settings as primary defense of large, often sprawling schools and campuses. Average enrollment in America's schools has been growing for the past 60 years or more, posting a 13% rate of growth for high school buildings, and a 15% rate of growth for elementary buildings in a relatively short 20-year period between 1987 and 2007. According to USDOE information, approximately 70% of American high school students currently attend schools of 1,000 or more students.

Questioning the effectiveness of large schools, as well as ability to meet the social and develop-

mental needs of all students, small schools researchers regarded the question of school size as early as the 1970s. Through the 1980s and 1990s, research into the topic had created a movement of sorts in the direction of smaller learning environments and communities. While no definitive conclusions have become available, broad consensus in the following areas exists:

- *Under the right conditions, as schools get smaller they produce stronger student performance as measured by attendance rates, test scores, extra-curricular activity participation and graduation rates.*
- *Smaller schools appear to promote greater levels of parent participation and satisfaction, and increase communication between parents and teachers.*
- *Teachers in small schools generally feel they are in a better position to make a genuine difference in student learning than do teachers in larger schools.*
- *There appears to be a particularly strong correlation between smaller school size and improved performance among poor students in urban school districts. These findings provide evidence that smaller schools can also help narrow the achievement gap between white/middle class/affluent students and ethnic minority and poor students.*
- *Smaller schools provide a safer learning environment for students. (ECS, 2010)*

These areas of consensus exist despite often conflicting research results in the areas of cost sav-

ings analysis, actual impact on student outcomes, and access to expanded educational and extracurricular activities. The question of cost continues to plague smaller schools, as generally, per pupil expenditures seem higher when comparing a multi-building (more buildings that house fewer students) to a single building (one building that houses more students) strategy. However, factoring in costs associated with on-time graduation, remedial services for students and social costs impacted by drop-out students may equalize actual expenditures. Independent attempts as well as efforts funded by the federal government and non-profit organizations including the Bill and Melinda Gates Foundation worked to show correlation between smaller learning environments and teacher satisfaction, student engagement, safety and graduation rates. As a result, there has been significant buy-in from many of the nation's largest school districts to break up schools into smaller learning communities. This buy-in seems to have been prompted in part by implementational funding from the federal government.

This paper will look at school size as it relates to student achievement, school climate, economic optimization and school governance. A summary of current literature will be provided along with discussion of the impact of school size on graduation rates, student discipline, teacher attitudes/teacher efficacy, student involvement and leadership considerations. Summary of various arguments is provided in the paper, followed by considerations for executive administrators and school boards in Pennsylvania public schools.

School Building Size

Is there a right size?

Introduction

As America grew through the end of the late 19th and early 20th centuries to become a world superpower, a national movement in the direction of modernization took hold of the country in all areas of life. Following World War I, as America focused inward as the result of more isolationist foreign policy, the country began to see extraordinary leaps forward in technology, medicine, organizational and management theory, national media presence and business innovation. From Henry Ford's introduction of the assembly line in 1913, to Chester Barnard's business leadership theories in 1938's *Functions of the Executive*, to a national shift in consumerism to an industrial strategy of planned obsolescence, national clamor for new, improved, faster, bigger and more efficient became the demand of the American population.

This demand extended beyond the business world to impact public education as America's school districts faced widespread consolidation through the 1940s, 50s, 60s and 70s. James Conant's 1956 book, titled *The American high school today: A first report to interested citizens*, spurred the consolidation movement with his assertions that cost effectiveness and sufficiently varied curriculum could only be achieved in schools with graduating classes of at least 100 students. Conant also argued at the time that small high schools were one of the biggest problems with the American public education system, and that

elimination of small schools should become a top priority in the nation.

When the Soviets launched Sputnik in 1957, a sort of national panic took hold in the United States. American educational programming was deemed insufficient to the demands of our race for scientific superiority, and politicians from the local level to the national began to take a closer look at the American public education system. The lessons of the past decades showed us that bigger was better and more efficient. And as the post World War II baby boom hit the nation, school sizes increased to ensure a wider range of academic programming that would put American students on the same level as those from the Soviet Union. The space race ended in 1975, and the Soviet Union collapsed in the following decade. But as a general rule, the size of America's schools has continued to grow.

What is a small school?

Paul Abramson, education industry analyst and Council of Educational Facilities Planners International Planner of the Year for 2008, writes in a June 2006 article for *School Planning & Management* of being asked what he believes will be the biggest issues that define how schools will function over the coming decades. His number one answer was school size. "Perhaps the small schools movement is just the latest fad. But, fad or not, the issue of the proper size of high schools needs to be explored in the context of the purpose of schools

and what size best allows them to do their job” (Abramson, 2006).

Many advocacy groups and authors have written about school size both before, and since that time. Smaller school size has been declared one of the top 12 educational trends shaping school planning and design (Stevenson, 2007). The federal government has incentivized school districts with large schools to create smaller learning environments for pupils. While there have been attempts to create scientific, peer-reviewed assessment of appropriate school size as it impacts building cost and student achievement, the results have been somewhat varied. While research tends to suggest that smaller learning environments may produce positive outcomes for students, the question of cost continues to remain. And there is no complete agreement among researchers related to the level of benefit to students provided by smaller learning environments. In fact, there is not even consensus as to what constitutes small.

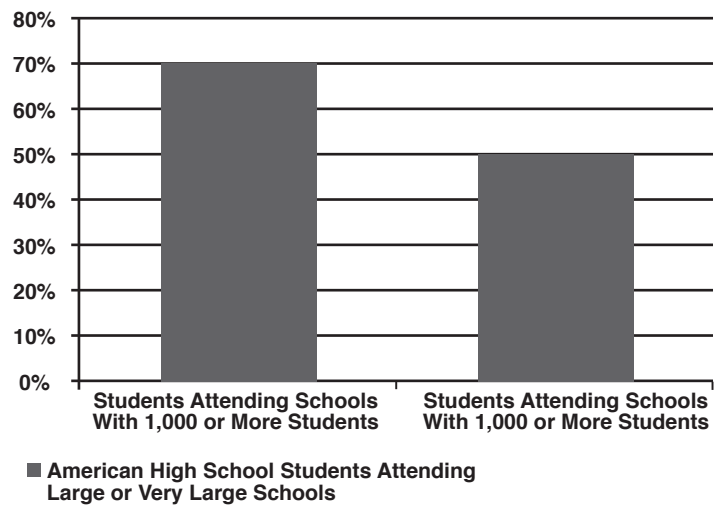
There is no standard definition of a small school. Ranges for small schools vary considerably, making understanding what exactly constitutes small a tricky endeavor. Most researchers in this area suggest separate definitions of small for elementary schools and secondary schools. Suggestions for elementary schools range from around 200-350 students as an upper limit, while in secondary schools the suggested upper limit range varies from 600-900 students per building. Some use a general number of 300-400 students to define small. Most agree that buildings with more than 900-1,000 students should be considered large, and most agree that appropriate size is an enrollment number that will vary from district to district.

Schools in transition

Over the past 40 years, much attention has been given to the appropriate size of schools. Cost and student outcomes stand out as the two main questions that arise when addressing the question of what size school to build. In the early 1900s, the United States public schooling system was made up of many small schools and small school districts that were all controlled and funded locally. A trend toward larger school facilities

Chart 1

American High School Students Attending Large or Very Large schools



USDOE, 2010

and consolidation of districts that gained momentum through the 1950s arose in response to several factors. Cold War concerns that American students were not on par with Soviet counterparts combined with the academic notion that economies of scale would see larger, more cost-effective schools that were able to offer more and better curricular options for students. James Conant effectively argued that larger schools were necessary for the appropriate academic preparation of United States’ children while consolidation proponents pushed for uniformity in educational programming, centralization of administrative processes and the development of area vocational-technical schooling. Conant’s call for diversified curricular options still holds weight today. Expanded and adequate educational opportunities for students are indeed crucial for the academic preparation of modern students. And while widespread push for consolidation of smaller districts continues in many parts of the United States, economies of scale still rings as the call of the cost-conscious.

Through the decades, schools grew in size and enrollment while the number of districts nationwide dropped dramatically from approximately 117,000 in 1937 to around 15,000 today (PSBA, 2009). During a 60-year period of time when the population of American public school children nearly doubled from 25

Table 1

Year	Average enrollment in schools, by type					
	Total	Elementary	Secondary		Combined Elementary/Secondary	Other
			All schools	Regular schools		
1982-83...	478	399	719	---	478	142
1983-84...	480	401	720	---	475	145
1984-85...	482	403	721	---	476	146
1987-88...	490	424	695	711	420	122
1988-89...	494	433	689	697	412	142
1989-90...	493	441	669	689	402	142
1990-91...	497	449	663	684	398	150
1991-92...	507	458	677	717	407	152
1992-93...	513	464	688	733	423	135
1993-94...	518	468	693	748	418	136
1994-95...	520	471	696	759	412	131
1995-96...	525	476	703	771	401	136
1996-97...	527	478	703	777	387	135
1997-98...	525	478	699	779	374	121
1998-99...	524	478	707	786	290	135
1999-2000...	521	477	706	785	282	123
2000-01...	519	477	714	795	274	136
2001-02...	520	477	718	807	270	138
2002-03...	519	476	720	813	265	136
2003-04...	521	476	722	816	269	142
2004-05...	521	474	713	815	298	143
2005-06...	521	473	709	819	318	128
2006-07...	521	473	711	818	325	138
2007-08...	516	469	706	816	300	147

National Center for Education Statistics, 2009, Retrieved 2010 http://nces.ed.gov/programs/digest/d09/tables/dt09_095.asp

million to almost 50 million students, the number of school facilities (buildings) dropped from 158,000 to only 92,000 currently (PSBA, 2009). Large, bureaucratically governed, sprawling campuses became the norm for America's high schools as more and more students were collected into fewer and fewer buildings. Average enrollment in regular American public high schools grew by 13% from 711 students to 816 students in a relatively short period of 20 years from 1987 to 2007

(NCES, 2009). Today, "approximately 70% of high school students in America go to schools with over one thousand or more kids" (Shapiro, 2009).

Similarly, the nation's public elementary schools grew in enrollment to accommodate dramatic population explosions in the 1950s and 1990s. Between 1982 and 2007, average enrollment in America's public elementary schools grew by 15% from 399 students to 469 students (NCES, 2009).

School size and impact on students?

As early as the 1970s, researchers had begun looking at student enrollment and its effect on student achievement. Researchers wondered if the growing size of America's schools was having an impact on students' academic achievement. Much research has been done in this area over the years, but unfortunately, there is no definitive work that conclusively determines the size of a school building has either a positive or negative impact on the academic success of all students. The Education Commission of the States (ECS), however, highlights several key issues among which there seems a broad consensus among school size researchers. These are:

- *Under the right conditions, as schools get smaller they produce stronger student performance as measured by attendance rates, test scores, extra-curricular activity participation and graduation rates.*
- *Smaller schools appear to promote greater levels of parent participation and satisfaction, and increase communication between parents and teachers.*
- *Teachers in small schools generally feel they are in a better position to make a genuine difference in student learning than do teachers in larger schools.*
- *There appears to be a particularly strong correlation between smaller school size and improved performance among poor students in urban school districts. These findings provide evidence that smaller schools can also help narrow the achievement gap between white/middle class/affluent students and ethnic minority and poor students.*
- *Smaller schools provide a safer learning environment for students.*

Source: ECS, 2010

General agreement on these statements has grown, in part as a result of the efforts of a group of vocal advocates who began to call for an examination of the effectiveness of America's large public schools at the elementary and secondary levels. As early as 1964, Barker and Gump had argued in their book, titled *Big School, Small School*, the value of smaller schools. This notion began to grow in popularity, and gained momentum through the 80s

and 90s. Over the years, small schools proponents noted what they considered to be deficiencies in a schooling system that seemed to be placing more kids into fewer educational facilities. Small schools advocates declared that large schools "contribute to depersonalization, negativism, alienation, and ultimately truancy and drop-outs" (Ehrich, 2000). Advocates for smaller schools also argued that social problems, including alienation and a decreased sense of belonging among students, can seem more prevalent in larger schools.

Because of a focus on "cognitive academic curricula," argues school size researcher James Garbarino (1997), those in charge of decisions related to school facilities have devalued the importance of social dynamics that exist in America's schools. Garbarino highlights the importance of what for many children is their first and possibly only substantive social interaction outside of a family environment. Famous Soviet psychologist and social development theorist Lev Vygotsky wrote widely through his life about the fundamental role that social interaction plays in a child's cultural development. And small schools advocates provide an interesting, seemingly paradoxical argument that larger schools with more students present the potential for diminished social interactions. The argument suggests that as students get lost in a sea of hundreds or even thousands of other children, it can become difficult to develop a sense of community for all students. In large schools, the number of students can have the effect of diminishing a personalized experience for children. It can be easier to blend into the crowd and to hide among all the other students.

Advocates for smaller schools pointed to the research of Barker and Gump (1964) as well as others (Shapiro, 2009) that suggest students in small schools are provided expanded opportunities for school community involvement as compared with students in larger schools. These researchers suggest students in small schools are better able to develop a fit into the social network that exists in schools by having, as a result of less competition, more opportunities to participate in extracurricular activities from athletics to social organizations.

Next, small schools advocates noted that discipline issues including student/student and student/

teacher violence, drug and alcohol use, and bullying seemed more prevalent in larger schools. Small schools champions argue that students in smaller learning communities are less prone to disruptive behavior as a result of a “more orderly” learning environment (Lee and Smith, 1995; Wasley et al., 2000; McMullan, Sipe, and Wolf, 1994; Quint, 2006; National Research Council, 2004; USDOE, 2010). Many opponents of large schools suggest that administrators and teachers in small schools can be more effective in controlling or limiting incidences of student discipline. Teachers and administrators have a higher likelihood of knowing students and fellow teachers by name in schools with fewer than 500 students (Shapiro, 2009), and are more likely to have an orderly environment with more in-place social controls (Leggett & Shapiro, 1983).

Mixed findings

But research to support these notions tends to be somewhat mixed. In 2002, the Bill and Melinda Gates Foundation released a “detailed opinion study” that included information gleaned from thorough interviews with education experts, parents and students. Findings from the report were also based in part on three national surveys that analyzed responses of students, parents, and educators in both small and large high schools. The study, titled *Sizing Things Up: What Parents, Teachers and Students Think About Large and Small High Schools*, points out that both small and large American high schools are plagued by “unsettling social and discipline problems” and that teachers and students in both large and small schools report a general lack of respectfulness, in addition to problems with drugs, alcohol, cheating and bullying (2002).

Improved student outcomes/student performance is always the ultimate goal for education reformers, and researchers have regarded the relationship between school size and student performance in an attempt to highlight a correlation between the two. As early as 1970, James and Levin wrote in a report released by the Brookings Institute that they could find no significant relationship between student enrollment and student achievement (Melnick, Shibles and Gable, 1987). Three years later, a report issued by the Maryland Small Schools Task Force agreed with James and Levin, indicating leadership, staff dedication and competency, and community support were more important factors of overall student achievement than school size (Melnick, Shibles and Gable, 1987).

In 1985, the Illinois State Board of Education issued a report indicating schools with student enrollments of fewer than 215 students, and more than 1,280 students resulted in lower overall student achievement than schools with enrollments between 215-493 and 494-1,279. A number of studies were conducted through the 1990s and early 2000s that were intended to compare student performance related to school size. But research in this area is again mixed, making it difficult to determine definitively the relationship between school size and student achievement (Trani and Irvine, 2010).

Table 2

Student/Teacher/Parents Perceptions Regarding Violence, Drugs, and Alcohol

% of respondents who say	Parents		Teachers		Students	
	Large Schools	Small Schools	Large Schools	Small Schools	Large Schools	Small Schools
Drugs and alcohol are a serious problem in their school	60	52	53	58	64	55
It is likely that a violent incident causing severe bodily harm will occur at their school in the next two years	45	45	46	32	27	20

Sizing Things Up: What Parents, Teachers and Students Think About Large and Small High Schools, 2002 www.publicagenda.org/files/pdf/sizing_things_up.pdf

Studies conducted through the 1990s in New Jersey, Virginia, Georgia, Montana, Ohio and Texas appear to provide evidence that school size may be a predictor of student achievement (Fowler and Walberg, 1991; Schnitzer and Caprio, 1999; Keller, 2000). The decisions by several of the nation's largest school districts, including New York City, Chicago and Philadelphia, to break up schools into smaller learning communities certainly seems to suggest strong support for the notion that small is better.

Shapiro (2009) highlights a United States Department of Education research summary that notes the value of small schools in increasing achievement, graduation rates, satisfaction and in improving behavior. The works of Coladarci (2006) and Lee and Loeb (2000) echo this notion, showing that smaller schools tend to have a positive effect on student outcomes. But the contemporary work of Tajalli and Opheim (2005) shows that size has no effect on student achievement (Trani and Irvine, 2010). Eckman and Howley (1997) found in their research what they called "a strong relationship between higher academic achievement and lower enrollment." Bradley and Taylor (1998), Lee and Taylor (1997), and Lee and Smith (1997), in separate research studies found that both schools that are too large and schools that are too small can have negative effects on student achievement. Some researchers wonder how much the perceived benefits of smaller schools are due to the school's size as opposed to factors including support from smaller communities, instructional quality or parental involvement. These questions remain, and while there is strong support nationally over several decades for the idea that smaller schools may promote student achievement, the evidence is hardly conclusive.

What about bigger?

It should be noted that in researching for this topic, it was difficult to find anyone currently actually advocating for larger, more populated elementary and secondary schools. But large schools continue to be built, and many districts across the country are either investigating or being pushed to investigate consolidation. Consolidation advocates and those in support of larger schools rely primarily on two main lines of thought when deciding to build bigger.

Quality of programming is often cited as a primary reason for providing larger and more expansive learning environments for students. Cost savings as a result of economies of scale is often noted as a second benefit to large schools and campuses. Occasionally, quality of facilities is mentioned as a benefit gained by larger schools and districts.

Large schools are in theory as well as in practice, often times better able to offer a wider array of academic and extracurricular activities. Small schools proponents argue more students in small schools will be able to take advantage of existing extracurricular or curricular-based activities including band, athletics, theater and clubs. Fewer students equate to less competition for available slots in those activities, which translates via this argument to increased opportunity. Those in favor of larger schools deliver a very similar argument: But the argument has a twist. Larger schools, while providing a more competitive environment for available slots in activities including athletics, band, theater, clubs, etc., are more and better equipped to provide an expanded array of opportunities for students. Students in small schools that may have guaranteed access to few of these types of activities within the school are compared with students who may have competitive access to a much wider array of activities in larger schools.

The same argument exists for academic programming. Some researchers, educational professionals and parents have wondered if a school can be too small to provide adequate curricular options for students. There seems to be some evidence to support this notion. Susan Black is an educational consultant and contributor to *American School Board Journal* (ASBJ), a magazine published by the National School Boards Association (NSBA). She investigates the question of the "Right Size School" in an April 2006 article in which she asks if schools can be "too small to provide adequate curriculum and instruction" (Black, 2006). Black's article points out small schools are likely to offer a smaller number of courses when compared with larger schools, saying, "In English, for example, students in large high schools might elect courses on 19th-century British novels, Shakespeare and African-American writers. In small high schools, students are likely to

be limited to a grade-level sequence labeled English I, II, III and IV” (Black, 2006). Melnick, Shibles, and Gable write in a 1987 article for *Research in Rural Education* that, “Proponents of large consolidated schools have claimed that large schools are capable of offering a greater range of courses. By providing more varied course offerings, students have greater flexibility in choosing courses to fulfill their graduation requirements and future career objectives.”

Researchers and small schools advocates acknowledge the potential for a more varied curriculum in larger schools and districts that often have a deeper pool of resources from which to pull. But some experts in this area point out that school size does not necessarily guarantee more and better course offerings. Many (Black, Abramson, Shapiro, Melnick et al) suggest a more appropriate indicator of quality of education is school leadership and teacher professionalism. Moreover, Shapiro (2009) writes that only 12% of students in large high schools take advantage of “specialized courses” associated with larger schools.

Cost is the reason most cited for reliance on large, sprawling campuses in the United States. An overwhelming majority of American school children attend public schools that are considered to be large, or very large. The idea of economies of scale suggests that building a larger facility rather than separate smaller facilities should result in overall cost savings related to per pupil expenditures and physical plant costs. This same argument has also been used consistently by proponents of school consolidation. Recent research in this area by the Pennsylvania School Boards Association does not support the supposition that significant cost savings are achieved through consolidation of school districts (PSBA, 2010).

Cost questions

There have been relatively few attempts to provide an unbiased, accurate and thorough assessment of the cost of smaller versus larger school facilities. One such attempt was made in a 2008 study partially funded by KnowledgeWorks Foundation and the Bill and Melinda Gates Foundation. Author Craig Howley challenged conventional wisdom that “holds that economies of scale necessitate the

construction of larger schools” (Howley, 2008). His study, doubting the bigger is cheaper mentality from which many new construction projects are approached, asked two primary questions. First, “Are larger schools less costly to build?” And second, “What contextual variables predict cost?”

The author brings up a remarkable lack of scholarly interest in this area, especially considering the often contentious nature of the process of building new schools. In Howley’s review of the relevant literature prior to his study, he found only one peer-reviewed scholarly study of school construction costs in all of professional education literature. This study, completed by Azari-Rad, Philips and Prus in 2002 looked at square footage rather than student enrollment numbers, and showed that a multi-building option as opposed to the erection of a single large facility increased construction costs by about 4.7%. Despite finding a savings value for building larger (square footage), Howley cites these authors’ most notable suggestion for saving on construction costs has “nothing to do with project size” (Howley, 2008). Instead the authors’ primary suggestion for saving money is to plan construction for periods of “economic downturn, when costs will be lower due to weak demand for construction” (Howley, 2008).

For Howley’s 2008 study, the author addressed his research questions by selecting a sizeable national data set of more than 3,000 new construction projects identified from the National Center for Education Statistics (NCES) with initiation dates between 1989 and 2003, and completion dates between 1996 and 2009. Noting an inadequate number of variables from his sampling, Howley was able to create a matched data set of 211 comparable projects from the original 3,471 by identifying contextual “variables of interest” including poverty, race and location. The study looked only at grades 9-12 secondary schools of less than 1,000 students, and found that the buildings intended to house 138-600 students were no more expensive to build than the buildings built with projected enrollments of 601-999 students.

Another study summarized in a 2009 article for National Clearinghouse for Educational Facilities (NCEF) by Duke, DeRoberto and Trautvetter, regards cost not from a traditional per pupil expen-

ditures view, but from a different perspective called “budget per graduate.” The 1999 study conducted by Funk and Bailey acknowledges per pupil expenditures as higher for students in smaller schools, but also considers what Duke, DeRoberto and Trautvetter refer to as “the crucial metric of on-time graduation” (2009). “Small schools, despite the slightly higher cost per pupil, demonstrated an overall cost effectiveness due to the greater percentage of on-time graduates” (Duke, DeRoberto and Trautvetter). Other researchers investigating this line of thinking also have tried to factor in social costs of non-graduates, costs associated with remedial teaching efforts, and costs associated with teacher turnover as a result of dissatisfaction in order to offset perceived cost benefit associated with economies of scale arguments intended to support creation of larger facilities.

Schools within a school

Small schools and smaller learning environments may offer benefits to students, including more personalized educational experiences, improved social interactions with other students, improved opportunities for participation in existing extracurricular activities and safer learning environments. But smaller schools may not always be a viable option for all school districts. A schools within a school model addresses and attempts to realize the benefits of both small and large schools. The idea of reorganizing America’s very large schools (2,000 or more students) into smaller learning communities arose from the realization in the 1980s that these large schools increased alienation and depersonalized the educational experience for students. A strong desire to improve educational outcomes through the 1980s and 1990s meshed with a desire to create schools that bolstered communities and added to the sense of an individualized educational experience where each student feels a part of the schooling process. Some of America’s largest school districts, including Chicago, New York City and Philadelphia, made a conscious decision to reorganize large public high schools into smaller, more personal, learning communities. The United States Department of Education jumped on board by 2000 to fund school reform efforts aimed at reducing the size

of America’s schools (particularly the largest high schools), and has offered millions of dollars through the USDOE Smaller Learning Communities Program to districts undertaking efforts to downsize or resize. More recently, in response to a growing consensus that there are likely benefits to educating students in smaller learning environments, and with the help of federal funding, Atlanta, Boston, San Diego, Los Angeles, Oakland and Nashville have committed similarly to creating a new, smaller environment for learning and teaching.

The schools within a school model attempts to create that smaller learning community in a large, generally urban or suburban setting in which a larger learning environment already exists or is built. School systems or districts looking to take advantage of the effects of smaller learning environments or to reduce the negative effects of very large schools have a number of options via a schools within a school model. Existing facilities can be reorganized to utilize space in a manner that supports the model. Districts may also choose to renovate and physically redesign buildings that have been used in the past for more traditional teaching approaches. If outlying buildings or satellite facilities exist, schools may choose to utilize such spaces. And finally, new construction may be an option in some districts.

The schools within a school model, it should be noted, is different from a transitional model that brings a new class of students (e.g. a freshman class into a high school) into a school and provides a somewhat isolated experience as students adjust to the newness of the larger environment. A schools within a school model often employs the use of an interdisciplinary team of teachers who share access to a limited number of students often over a number of years in order to be able to create an environment where teachers can provide a uniquely personalized educational experience. In short, schools within schools is a method of breaking large learning communities into smaller learning communities where the perceived benefits of smaller schools can be recognized despite a large setting. Students, parents, and teachers are expected to all work together as teachers collaborate across individual curricula in order to provide a personal-

Table 3
Number and Percentage of Schools
by Size in Pennsylvania

Number of Schools	Student Enrollment	Percent of PA Schools
395	0-249	13%
1257	250-500	42%
800	501-750	27%
282	751-1000	9%
124	1001-1250	4%
74	1251-1500	2%
28	1501-1750	1%
26	1751-2000	1%
6	2001-2250	<1%
4	2251-2500	<1%
3	2501-2750	<1%
3	2751-3000	<1%
5	3001-3250	<1%
2	3251-3500	<1%
0	3501-3750	<1%
1	3751-4000	<1%
0	4001-4250	<1%
0	4251-4500	<1%
0	4501-4750	<1%
1	4751-5000	<1%

Table 4

Pennsylvania's Largest High Schools, Grades 9-12 for 2009/2010

Number of Students	Location	AYP Status
2,895	Bucks	Corrective Action II, Year 4
2,927	Northampton	Corrective Action II, Year 4
3,012	Northampton	Corrective Action II, Year 4
3,124	Lehigh	Corrective Action II, Year 4
3,158	Lehigh	Warning
3,191	Philadelphia	Corrective Action II, Year 3
3,369	Bucks	Making Progress in Corrective Action II
3,442	Luzerne	Corrective Action II, Year 4
3,762	Delaware	Corrective Action II, Year 4
4,868	Berks	Warning

ized, interdisciplinary experience. Large numbers of students within this method of learning are broken up into houses, academies, wings, pods, clusters or magnets in order to recognize the benefits of smallness. These smaller groups of students can consist of grade levels or encompass multiple grade levels, and often number less than 200-300. Sometimes, a school within a school may have a specific curricular focus or be aimed at addressing the needs of a specific group of students. Some alternative schools for students with disciplinary needs may be seen to fit into this type of school within a school.

A school within a school may have its own budget and staff members. The teachers and administrators within will operate largely independently of the school at large, creating plans, making programmatic decisions, and handling operational processes autonomously. But the school within a school can benefit from the larger size of the overall building by sharing common spaces including gymnasiums, auditoriums, lunchrooms and playgrounds, etc., with other learning communities within the school.

The extent to which a smaller learning unit within a school is autonomous can differ greatly. Some schools employ a method of separation by which the smaller environments are only minimally distinct among the larger environment while others allow the individual units almost complete separateness. It is up to the individual school and district to decide what is most appropriate on a case by case basis. Much of the literature suggests, however, that a key ingredient to success is decentralization of administrative processes. This can include support and counseling services, which should be more immediately accessible within a schools within a school environment than in a traditional larger schooling counterpart.

While documented, research-grounded successes have varied within the concept, most proponents of the model agree flexibility in implementation as well as commitment to the model are critical factors to success. Committed leadership from all administrators is

necessary in order to create community and faculty support for the initiative which may take years to fully realize.

School size and student performance in Pennsylvania’s public schools

Pennsylvania’s schools are in many cases as diverse as the commonwealth itself. The schools in the public education system run the gamut in terms of location, size and performance as determined by Adequate Yearly Progress (AYP). The rural, suburban and urban schools in Pennsylvania range in student enrollment from what is considered very small, to what is considered very large. A very few of Pennsylvania’s high schools rival in size the most populated high schools in the United States despite having only one school district in the list of America’s largest school districts (Philadelphia). But for the most part, Pennsylvania’s schools are fairly consistent with the national average. Pennsylvania’s average enrollment for regular secondary schools is indicated in National Center for Education Statistics 2009 data to be 875 students. The national average enrollment for regular secondary schools is 816 students.

Analysis of 2009-10 enrollment data for Pennsylvania, presented in Table 3, shows the highest number of Pennsylvania schools fall within the 250-500 students range. This includes both elementary and secondary schools. Forty-two percent or 1,257 Pennsylvania public schools fall within the 250-500 students range. Twenty-seven percent of Pennsylvania public schools fall between the 501-750 students range. This percentage represents 800 public schools. Thirteen percent of Pennsylvania’s public schools enrolled fewer than 250 students, while 9% enrolled between 751-1,000 students. One hundred twenty-four schools enrolled between 1,001-1,250 students, 74 schools enrolled between 1,251-1,500 students, and 28 enrolled between 1,501-1,750 students for the 2009-10 school year. Twenty-six schools, or less than 1%, enrolled between 1,751-2,000 students. Twenty-five schools enrolled more than 2000 students for the 2009-10 school year, with the largest enrolling 4,868 students.

PDE enrollment data also indicates five Pennsylvania schools housed fewer than 20 students for the 2009-10 school year. Four schools had enrollment

numbers of between 20 and 50 students. And 40 schools had enrollment numbers of between 50 and 100 students.

The largest school in the state by enrollment for 2009-10 was Reading Senior High School in Berks County. There were eight public grades 9-12 high schools in Pennsylvania with enrollment numbers greater than 3,000 students. Two are located in Lehigh County. The others are located in Berks, Bucks, Delaware, Luzerne, Northampton and Philadelphia Counties.

AYP levels for Pennsylvania’s largest schools by enrollment, presented in Table 4, varied for the 2009-10 school year. AYP reports the performance of schools and districts in status levels that depend on the school or district’s performance in recent years. AYP status levels consist of Made AYP, Making Progress, Warning, School Improvement I, School Improvement II, Corrective Action I and Corrective Action II. One of the schools, with an enrollment of 3,369 students, was Making Progress in Corrective Action II. Two were at Warning status. The remaining schools on the list of largest high schools were in Corrective Action II.

Pennsylvania’s largest public elementary schools (enrolling students in grades K-6) ranged in enrollment from 889 students to 1,169 students. The public elementary school enrolling the most students in the state for 2009-10, located in Bucks County, was 13 times larger than the smallest elementary school in the state. Four of the largest elementary schools are located

Table 5
Pennsylvania’s Ten Largest Elementary School
by Enrollment for 2009-10

Number of Students	Location	AYP Status
889	Bucks	Made AYP
903	Bucks	Made AYP
931	Luzerne	Made AYP
984	Montgomery	Made AYP
991	Cambria	Made AYP
1,018	Northampton	Made AYP
1,079	Bucks	Made AYP
1,102	Philadelphia	Made AYP
1,150	Philadelphia	Made AYP
1,169	Bucks	Made AYP

in Bucks County, and two are located in Philadelphia County. The remaining are located in Cambria, Luzerne, Montgomery and Northampton counties. As shown in Table 5, all of the schools Made AYP for 2009-10.

Table 6 shows the Pennsylvania public high schools (grades 9-12) with the smallest student enrollment numbers for 2009-10. These schools ranged in enrollment from 138 students to 258 students. There were two senior high schools with 258 students. Three of the schools are located in Philadelphia County. The remaining are located in Bucks, Cambria, Clinton, Fulton, Lawrence, Perry, Potter, and Somerset Counties. Nine of the eleven of Pennsylvania's smallest public high schools Made AYP for 2009/2010. Two were at Warning status.

Table 6
Pennsylvania's Smallest High Schools,
Grades 9-12, for 2009-10

Number of Students	Location	AYP Status
138	Clinton	Warning
146	Potter	Made AYP
146	Somerset	Made AYP
181	Philadelphia	Made AYP
211	Cambria	Made AYP
221	Philadelphia	Made AYP
244	Fulton	Made AYP
244	Bucks	Warning
254	Lawrence	Made AYP
258	Perry	Made AYP
258	Philadelphia	Made AYP

As shown in Table 7, all of Pennsylvania's 10 smallest elementary schools (grades K-6) Made AYP for 2009-10. Enrollment numbers for the 10 smallest schools ranged from 90 students to 127 students. Two of the schools are located in Bradford County and two are located in Venango County. The remaining schools are located in Forest, Indiana, Luzerne, Schuylkill and Westmoreland counties.

Table 7
Pennsylvania's Smallest Elementary Schools
by Enrollment for 2009-10

Number of Students	Location	AYP Status
90	Venango	Made AYP
111	Forest	Made AYP
114	Venango	Made AYP
118	Indiana	Made AYP
118	Schuylkill	Made AYP
124	Luzerne	Made AYP
125	Westmoreland	Made AYP
125	Bradford	Made AYP
127	Venango	Made AYP
127	Bradford	Made AYP

Table 8 compares the largest and smallest building results to all schools in the state. When compared with all schools in the state, the combined largest and smallest schools in the state showed a slightly lower percentage of buildings Making AYP. Seventy-one percent of the largest and smallest buildings in the state combined Made AYP as compared with 77% of all schools in Pennsylvania that Made AYP for 2009-10. The combined largest and smallest schools in Pennsylvania did have a substantially higher percentage of schools in Corrective Action II. The percentage of combined largest and smallest schools in the state in Corrective Action for all years was more than three times that of all buildings in Pennsylvania.

Only 50% of the 20 largest secondary and elementary schools in the state Made AYP for 2009-10, and 35% were in Corrective Action II. Only 5% of all schools in Pennsylvania were in Corrective Action II for 2009-10. The 21 smallest elementary and secondary schools, on the other hand, outperformed the largest schools, all schools, and the combined group of largest/smallest schools, with 90% making AYP for 2009-10. The median school enrollment for all schools for 2009-10 was 461 students. All schools matching the median enrollment value Made AYP for 2009-10.

Table 8
AYP Status Levels for Pennsylvania Schools

	Statewide (All Schools)	Largest/ Smallest Sec/Elem Combined	Largest Sec/Elem Schools	Smallest Sec/Elem Schools	Schools at Statewide Median (461 Students)
Made AYP	77%	71%	50%	90%	100%
Making Progress	6%	2%	5%	0%	0%
Warning	7%	9%	10%	10%	0%
School Improvement I	2%	0%	0%	0%	0%
School Improvement II	2%	0%	0%	0%	0%
Corrective Action I	1%	0%	0%	0%	0%
Corrective Action II	5%	17%	35%	0%	0%

Considerations for boards

There is no best size for all schools in all school districts. The decision to educate students in large or small buildings utilizing large or small learning environments is ultimately up to local school officials. But there are a number of considerations to keep in mind when regarding a small schools or schools within a school model.

School boards considering moving to a small schools or a schools within a school model may be confronted with resistance from community members and/or individual board members. The idea of change can be overwhelming and frightening. It is important to remember that the school building, as a visible symbol of the district and the community, means different things to different people. Often, the loss of a school or a significant operational change can be difficult for community members who may wonder why change is necessary. A school can be a powerful symbol of community that can be utilized by skilled educational leaders to garner support for educational initiatives, mobilize community involvement for local activities and priorities, and create cohesiveness among current and former students. The loss of, or a significant change to this powerful symbol can be frightening, diffi-

cult to understand, or even offensive to individuals and community groups who may not see the need to “fix” a system that they perceive as having worked “just fine when I went to school.” A skilled superintendent in partnership with a committed board should be diligent to create understanding within the community via a variety of community engagement strategies.

Boards should be ambitious in their efforts to include the community throughout the process. Invite comment, share vision, and always be prepared to answer questions about why and how.

Try to remain sympathetic to individuals and groups that may feel a sense of loss. Teachers and employees of the district should not be neglected, and can assist the superintendent and board in making informed, data-driven decisions leading up to and following a commitment to move to a small schools model. Working in partnership with school employees will help to show the community as well as staff that informed decisions are being made out in the open for all to see. It will also show teachers that the new approach to teaching being undertaken by the district is being undertaken with the best interest of all in mind.

It is also important to remember that change – physical, psychological and cultural – takes time. A physical change to a building that breaks a large, traditional building into houses, academies, wings, pods or clusters may take several years. Constructing new buildings may take as long or longer. But more meaningful changes often can take much longer, and must take place over time. Boards may need to contend with the challenges associated with implementing a completely new way of teaching and thinking over a period of years, as teachers relearn how to teach, and students relearn how to learn.

Conclusions: Big? Small? What's the right answer...?

While there seems some consensus that smaller learning environments may provide advantages to students, evidence that definitively supports the notion is lacking. Much has been written about the positive effects provided by smaller learning communities on student achievement, teacher efficacy, graduation rates, student satisfaction and student discipline. But again, there is no academic work that concludes in such a way as to demand the abandonment of larger facilities in all instances by all school districts in the United States.

The United States Department of Education has this to say regarding school size in response to current research findings:

1. *Large high schools, particularly those serving low-income students, have disproportionately lower achievement and higher incidences of violence than smaller schools serving similar student populations.*
2. *In small schools, students tend to be more satisfied, more academically productive, more likely to participate in school activities, better behaved, and less likely to drop out than students in large schools.*
3. *The size of high schools may have an indirect effect on student learning. Essentially, more moderately sized schools – those with 900 or fewer students – likely improve the climate and conditions for student success, especially teacher sense of self-efficacy and appropriate sense of responsibility for student learning, when accompanied by high expectations, standards and supporting strategies*
4. *Smaller schools also may be safer because students feel less alienated, more nurtured and more connected to caring adults, and teachers feel that they have more opportunity to get to know and support their students.*
5. *While small schools have a higher cost per pupil than large schools, they have a lower cost per graduate since they tend to have lower dropout rates. Also, the higher percentage of dropouts from large schools carries additional societal costs.*
6. *At the same time, some high schools may theoretically be too small to provide adequate resources, and the effects of school size may be more important for some groups of students than others. USDOE, 2010 <http://www2.ed.gov/about/offices/list/ovae/pi/hs/school-size.html>*

Research on the impact of school size on educational expenditures is also somewhat inconclusive. Howley notes a considerable dearth of scholarly interest in this area while concluding in his 2008 study that smaller schools are no more expensive to build than their larger counterparts. Howley's narrow focus on only grades 9-12 schools of less than 1,000 students as well as the ultimately relatively small national sampling of schools somewhat limits the value of the study, as many of America's school aged children are educated in school buildings of more than 1,000. The study also fails to address operational and educational costs subsequent to construction.

Other authors (Azari-Rad, Philips and Prus, 2002) suggest minimal cost savings via larger facilities, but focus instead on other alternatives for saving money during construction. Finally, there seems to be credibility to the idea that cost savings through smaller schools may be achieved ultimately when factoring in additional expenses incurred by larger facilities related to remedial efforts for underachieving students, teacher turnover as a result of dissatisfaction, and societal costs associated with non-graduates.

Some questions remain as to the actual impact of smaller schools. There is, however, complete agreement among researchers and academic professionals in the value of well-educated, committed and competent school leaders and professional staff members. There exist proven strategies for improving student outcomes and maintaining high levels of student achievement. Flexibility, a willingness to identify areas of critical need within the school environment along with a long term commitment to establishing goals and strategies for success, and appropriate leadership approaches are clear and agreed upon indicators of positive academic achievement within public schooling systems.

The question of bigger or smaller is one that can be argued locally and nationally by academic researchers, educational professionals and elected school governance agents. But ultimately, the decision of a “right” size is one that can only be deter-

mined after careful analysis of the needs within each individual district. The question of “right” size is one that should be determined locally on a case by case basis.

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Notes

Notes

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