Educational Trends Shaping School Planning and Design: 2007

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In 2002, NCEF published Ken Stevenson's Ten Educational Trends Shaping School Planning and Design, *which received considerable attention and has been downloaded from the NCEF website by thousands of users. Here is an update by the author, with the ten trends expanded to twelve.*

This publication, like its predecessor, examines educational trends potentially influencing the planning and design of school facilities. Although we can't know exactly how such trends might play out in the future, their thoughtful consideration during the planning and design process could have a profound effect on how successfully a new or renovated school will perform over its useful life. The trends were identified by reviewing the latest research on school facilities and student outcomes; current issues, problems, and initiatives in the educational field; emerging demographic patterns; and my previous work on this subject (Stevenson, 2002).

Trend One: "School Choice" and "Equity" Redirect Facilities Planning

When public education was the only choice for most children, planning for school enrollment was a relatively simple process. Schools traditionally operated within fixed geographic boundaries; planners used local demographic data in combination with enrollment projection techniques to estimate the number of students a school was likely to serve. However, one of today's educational-reform trends is school choice—as opposed to school assignment—rendering ineffective the traditional demographic method of projecting school enrollment numbers.

Parents and policymakers around the country, unhappy with public education, have attempted to dismantle what they consider to be a public monopoly over the delivery of K–12 schooling. Increasingly, they have pushed for vouchers and tax credits that permit parental choice and offer alternatives to the local public school.

In response, school districts have begun to move away from the "if you live on this street, you go to this school" rule. Instead, they offer parents options ranging from magnet schools to charters (Shostak, 2004). One result is that by 2005 there were approximately 3,400 charter schools in the United States serving about 800,000 students (Carpenter, 2005). Increasingly, school systems have embraced the concept that parents and their children should have some choice about which school a child attends.

What result for schools has the movement from prescribed attendance zones to school choice created? Great uncertainty. School planners are uncertain how many students will actually show up at a particular school and uncertain about what amenities that school needs. A magnet school for the arts, for instance, requires distinctly different spaces and equipment than a school that emphasizes science and technology.

Growing numbers of educators and policymakers have begun to realize that "identical" school facilities do not translate into "equal opportunity" for students. While some students function measurably better in one kind of environment, others perform more effectively in another; the differences depend on student talents, abilities, and needs.

The focus has shifted away from developing district-wide plans providing equal facilities and toward plans providing specialized facilities that meet schools' individual program needs. In the past, a good district facilities plan provided schools with similar features as a matter of fairness and equality. If School A had two gyms, the facilities plan ensured that School B also had two gyms. Today's trend calls instead for equity, defined as sufficient amenities to support and maintain the unique program and intended audience of a particular school.

As a result of school choice and equity trends, planners and educators may increasingly find themselves challenged to develop individualized renovation and construction plans that support a particular school's distinctive mission.

Trend Two: Small May Trump Large

The educational literature abounds with articles that promote the virtues of small neighborhood schools (Raywid 1998; Cotton 2001; VanderArk, 2002; Toch, 2003). Some states—notably, Florida—have even tried unsuccessfully to mandate uncommonly low school enrollments (Matus, 2005). In the next 25 years it may not be unusual to see elementary schools housing an average of 200 students, middle schools with no more than 400 to 500 students, and high schools with 500 to 750 students.

Supporters of the trend argue that small schools are particularly good at improving the academic achievement for students who have not done well in traditional settings, and that small schools have higher graduation rates, promote greater student involvement in co-curricular activities, and experience improved student behavior (Wasley, 2002; et. al.). Supporters also believe that since children are better known to teachers and administrators in small schools, they are safer and receive more individualized instruction.

Will the interest in smaller schools continue? That depends on at least two considerations. First, research findings are mixed about whether small or large schools actually produce better academic results (Stevenson, 2006a). Second, even if small schools are found to produce superior academic outcomes, the cost of building them may be too great. Many communities have aging populations who have no direct school contact and may be reluctant to levy school tax increases. This could have a dramatic negative effect on the small schools movement. The counterargument contends that if small schools demonstrably produce higher graduation rates, in the long run they cost communities less than do large schools.

For this combination of reasons, planners and educators need to discuss optimum school size when developing a long-range facilities program.

Trend Three: Reduced Class Sizes? Maybe

There is also substantial interest in smaller class sizes (Achilles, 2003). Significant research demonstrates that smaller-class benefits not only include enhanced academic performance but improved student behavior and teacher morale (Finn & Pannozzo, 2003). A few studies further suggest that such classes particularly benefit at-risk students (Nye, Hedges, & Konstantopoulos, 2004).

Future growth of the movement to lower teacher-pupil ratios depends on at least two factors. First, smaller classes cost more because they require not only more classrooms but also more teachers. As in the case of the smaller-schools trend, an aging population may be reluctant to support increased school taxes. Second, not all research supports the contention that small class size is better. In a recent review of 19 class-size studies by the Center for Public Education (2005), some studies found no linkage between student achievement and lower teacher-pupil ratios. As Schneider (2002, p. 16) stated succinctly, "The class size debate is unresolved, although few would argue against smaller classes where possible. This is an educational issue that has serious impact on school planning and design, since smaller classes require more classrooms or more schools, a fact that may seem self-evident but is often lost in the debate."

Political pressure to reduce the number of children in a classroom will persist, however, because many parents, teachers, policymakers, and certain researchers are convinced smaller class sizes can enhance learning, teaching, and the general quality of life within schools. Before building new schools or adding to existing ones, planners and educators should thoroughly explore how to optimize class size, while bearing in mind the possibility of a diminishing tax base and conflicting research about what the definition of "optimal" class size should be.

Trend Four: Technology Goes Big Time

School districts will need to develop effective methods to control costs caused by more-numerous neighborhood schools, lower teacher-pupil ratios, higher energy costs, and reduced tax revenues. One solution would be by means of virtual education, or "e-schooling" (Berge & Clark, 2005). Students seeking more specialized or advanced courses would take classes via closed circuit television or the Internet. Since these are packaged courses, they would require fewer personnel, a cost savings for the school.

Another cost-control possibility may be the use of computers, networks, and software to deliver basic educational programs within the school (Snyder, 2004). For example, instead of four teachers delivering instruction

to 100 fourth-grade students, schools may have one master teacher and a team of teaching assistants who help students use packaged courses to gain knowledge or skills in a particular subject. The master teacher works like a doctor, diagnosing and determining treatment, assigning all but the most complex educational intervention procedures to others. While this approach has been discussed for 20 years, advances in technology have made the likelihood of this instructional model not only possible but also probable.

There needs to be substantial conceptual rethinking of school buildings and the spaces they contain. Teacher preparation and staff development for the effective use of technology will become high priorities (Davis & Roblyer, 2005). Planners and designers should create the most flexible school facilities possible to accommodate the shifting landscape of instructional practices and technology.

Trend Five: The Mission May Change

In many cases, school buildings must accommodate a change in mission. Schools attempting to maximize standardized achievement test scores, for instance, may need to modify their curricula (Dillon, 2006). Students with academic difficulties may be required to take additional courses in their problem areas. To enhance their scores on state or national tests, students may be required, for instance, to sign up for a second course in math rather than taking art as an elective. Even students doing well in math or science may be encouraged to take more math and science, rather than non-academic electives, to raise their school's academic profile. As schools increase the focus on traditional academic subjects, demand for music, art, vocational courses, and even physical education may diminish. It is possible to envision some schools comprised primarily of academic classrooms, with few spaces for "non-essential" subjects. Indeed, in some charter schools this is now the case.

Or, paradoxically, traditional academic classrooms may largely disappear, replaced by holistic learning labs and exploratory centers (Butin, 2000; Keep, 2002). To support this approach, classrooms must be multi-purpose, allowing a blending of traditional instruction with meaningful and diverse hands-on, lab-type experiences that include anything from potterymaking to dramatic arts. Schools in this mold provide a physical environment that stimulates creativity and fosters a sense of belonging (Jarman, Webb, and Chan, 2004).

Regardless of their educational focus, many schools are being opened for community use (Sullivan, 2002; Bingler, 2003). Classrooms used during the day by students may be occupied by community organizations at night. Adults in the neighborhood may drop by the school health room for a blood pressure check with the school nurse. Seniors may walk school corridors after hours for exercise. When a school's mission includes greater community use, its classrooms and common spaces do double duty.

Educators and planners need to keep in mind that school missions change, and when they do spatial requirements change with them. To the extent possible, new schools should be planned and designed as flexibly as possible to accommodate such changes.

Trend Six: Classrooms Are Being Reconfigured

Traditionally, the number of students assigned to a classroom has been largely related to creating a balanced class for the teacher. Increasingly, however, students are being grouped by learning styles (Porterfield, 2005). This trend may affect school design in two ways. First, it requires a variety of classroom sizes and configurations to accommodate different learning styles or tasks. Second, entire schools may be devoted to specialized learning styles (Tileston, 2000).

For instance, students who are visual learners would attend schools designed to support visual media. Students who are kinesthetic learners would attend schools designed to support physical activity. The critical point for planners and educators is that the "one-size-fits-all" classroom model is disappearing, and a quest for more flexible and adaptable classroom configurations should be part of the school planning process.

Trend Seven: Schools Go 24/7

Students are often required to spend more time at school due to improved-education demands by policymakers and society in general (Farbman & Kaplan, 2005). To better serve at-risk students—particularly at the high school level—and to use buildings and classrooms more efficiently, a greater number of districts are

implementing "twilight schools" and year-round schooling (The Principals' Partnership, nd). In some schools, non-traditional students attend classes before or after work or on weekends. When school buildings are not being used for school functions, they often remain open to serve community interests.

Increased school use causes more rapid wear of building materials and equipment, so schools that are occupied during the summer lose critical down-time for making major repairs. Clearly, durability, energy efficiency, and life-cycle maintenance must be major considerations when planning and designing schools for extended use.

Trend Eight: Paper Is Disappearing

Paper-based learning materials may largely disappear from the classroom, particularly in the higher grades. Many reference materials, including journals and magazines, are available now in electronic form or through the Internet (Beare, 2001). Textbooks and workbooks may be placed online, with students accessing them through laptop computers at school or home (Simon, 2001). Assignments may be submitted, graded, and returned electronically. Enrichment and remedial instruction may be individualized through use of academic assessment software that provides each student with electronic assignments tailored to his or her past performance and learning style.

In the digital age, it is more important than ever to consider the adequacy of electrical service, the number of Internet connections, type and configuration of local and wide-area computer networks, and the size and design of classrooms and media centers. Increased use of computers and other electronic resources affects the visual, thermal, acoustical, and physical needs of these spaces. Controlling glare that interferes with viewing computer screens, installing sufficient cooling to overcome the heat produced by electronic equipment, and providing laptop charging stations and adequate sound treatment are critical to providing an adequate learning environment. In addition, schools may need additional secure storage to accommodate an array of expensive e-learning tools, such as electronic whiteboards. Educators and designers need to be creative about how schools will accommodate the e-instruction of tomorrow.

Trend Nine: Grade Spans Are Changing

Substantial research indicates that each transition to a new school has a negative effect on student learning (Renchler, 2000). Some school districts are seeking to reduce school changes by adjusting grade span configurations. The K–8 school is staging a comeback. Some districts are seriously considering a return to K–12 schools, where all grades are under one roof. Revisiting the K–12 school is part of the idea of a neighborhood education center where students can go to the same school near their home, from kindergarten through high school graduation.

Other school districts are moving in the opposite direction. While K–5 or K–6 has been the standard elementary pattern for years, more districts are splitting this configuration to create primary and intermediate schools (McEntire, 2002, updated 2005). The argument for this approach is that the whole faculty of a primary school, for example, will focus on educational techniques supportive of early childhood education. Similar initiatives include stand-alone sixth- and ninth-grade centers.

Changing traditional grade groupings affects the layout and location of all the schools in a geographic area. Hence school districts need to examine this subject carefully before altering grade groupings.

Trend Ten: Special Education Has Gone Mainstream

The Individuals with Disabilities Education Act of 1997 required students with disabilities to be taught along with their non-disabled peers "in the least restrictive environment possible" (Amerman and Fleres, 2003, para. 1; Ansley, 2000; Abend, 2001). Many schools, however, continue to be constructed and operated in ways that physically and socially isolate disabled children from their non-disabled peers.

A traditional school layout is easily identified because it has a separate wing or pod for special-needs students. Special education children who do get included in standard classroom activities often travel from one end of the school to the other to get to their classrooms. These classrooms are designed for one teacher and 20 to 25 students, so when a special education teacher attempts to work with a mainstreamed special-needs

child in a classroom setting, the lack of appropriately designed space creates conflicts with the ongoing instructional activities of the primary teacher. In such cases both the primary and special education teachers feel their children have been slighted.

This is no small concern. Currently nearly seven million students ages six through 21 have been identified through IDEA as requiring special instruction (Adams, 2006). That is, approximately 12 out of every 100 students in school must be provided with special services to address their disabling condition in a way that allows them to be socially, emotionally, and physically a part of the school as a whole. Most experts agree that the percentage of students identified as disabled will continue to grow in the coming decades.

What does this mean for planners and educators? Schools housing disabled students should be designed or modified with these children in mind, and should include a seamless interface between special education services and standard classroom instruction (Abend, 2001). Special classrooms for most, if not all, classifications of disabilities should be intermingled with general instructional spaces. Classrooms and laboratories should be designed so that disabled students and their teachers are comfortably and effectively included in the instructional activities that support the school's curriculum.

Trend Eleven: Early Childhood Programs? Plan On Them

In many school districts, mandatory kindergarten for five-year-olds was unusual until a few years ago. Now talk abounds of expanding early childhood programs to include three- and four-year-olds and, in some cases, babies and toddlers (Wilen, 2003). At a time when high-stakes testing drives educational accountability, one key argument for universal schooling of pre-kindergarteners is this: Children who do not come to school ready to learn are destined to struggle throughout their educational experience, and are more likely to fail.

While not everyone agrees that such early intervention is necessary, many states are either considering or actively pursuing no-cost, high-quality preschool for all three- and four-year-olds (Pascopella, 2004, para. 4). With increased national attention on the pre-school years, educators and design professionals should carefully consider how and when to provide sufficient space to house this new population. The design of such facilities needs to ensure that age-appropriate developmental activities, many of which require considerable space and storage, can be carried out effectively in early childhood classrooms.

Trend Twelve: School Is Where the Hearth Is

The preceding trends suggest ways schools are changing, but another scenario exists: Schools as we know them will disappear altogether (Northwest Educational Technology Consortium, 2002; Stevenson, 2006b). With the rapid development of technology and the increasing lack of confidence parents have in public education, the disappearance of the brick-and-mortar structure called school is not implausible.

Imagine a child entering a quiet place at home where teachers and fellow students are present only on a computer screen. The child has access to lessons prepared by the most knowledgeable professionals in the world and can interact electronically with teachers and students anywhere, on any appropriate subject. This virtual classroom is already a reality. Parents who homeschool increasingly use electronic media and the Internet to access instructional materials. Students in remote areas of Canada and Australia, hundreds of miles from a school building, attend school by logging on to their computers. Technology allows high school students in rural Kansas to take a course online from "classrooms" anywhere in the world.

Begging the question of who—or what—will assume responsibility for the socialization process traditionally assigned to schools, should school buildings be designed as traditional learning environments or as production and broadcast centers? Considering that schools have a life span of a half century or more, school districts might give at least some thought to how its buildings someday might be adapted to alternative educational, community, or private sector use.

Examine Trends and Question Authority

These twelve trends have the potential for making schooling in America unrecognizable within a few decades, so it behooves educators and planners to ask continually:

- What is emerging in educational practice that affects the ways we think about schools?
- How is the demographic composition of our community changing the way education should be delivered?
- What will future taxpayers be willing to support?
- Can education be delivered in a more efficient, effective manner?

The quality of answers to these questions will determine how well tomorrow's school facilities will support the educational needs of the twenty-first century.

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