Planning and Designing for Students with Disabilities

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Over 25 years ago, Congress created an education bill of rights for children with disabilities. In doing so, it could not have anticipated the improved medical procedures that have significantly increased the number of children who survive serious medical conditions but are left with moderate to profound disabilities. Increasingly, these children are entering public elementary and secondary schools and must be served in the general education classroom. To meet the challenge of educating these students, school designers must go beyond providing barrier-free buildings by embracing a broader concept of accessibility—that of providing students with disabilities the maximum possible access to general education.

Laws and Regulations

Several decades of federal laws and regulations in the United States have clearly established a mandate for a "free and appropriate education for all students with disabilities in the least restrictive environment." Section 504 of the Rehabilitation Act of 1973 (Public Law 93-112) and the Education for All Handicapped Children Act of 1975 (Public Law 94-142) guaranteed students with disabilities the right to equal educational opportunities (Abend 1979, p. 1). The 1975 law applies to children with disabilities who require special education and related services. Section 504 applies to children with disabilities whether or not they require special education services.

In 1990, the Education for All Handicapped Children Act of 1975 was amended and renamed the Individuals with Disabilities Education Act (IDEA). The IDEA amendments of 1997 (PL 105-17) strengthened, to the maximum extent possible, the right of students with disabilities to be educated with nondisabled students. The 1997 amendments also emphasized the preference for students with disabilities to be provided access to general education programs.

The Americans with Disabilities Act (ADA) of 1990 prohibits discrimination on the basis of disability. Subtitle A of Title II of the ADA applies to state and local governments, including public schools. Similar to Section 504, ADA requires school districts to provide programs and services that are readily accessible and usable by individuals with disabilities. Title II of ADA requires that public schools comply with either the Uniform Federal Accessibility Standards (UFAS) or the ADA Accessibility Guidelines (ADAAG). Some states have additional requirements.

The UFAS and ADAAG, however, are based on adult design criteria and do not address the accessibility requirements of children with disabilities. In 1998, the Federal Access Board published *Building Elements Designed for Children's Use,* an amendment to ADAAG that includes specifications for accessible building elements designed for use by children. The guidelines, available at *http://www.access-board.gov,* are based on dimensions and anthropometrics for children ages 12 and under. To date, the guidelines have not been adopted by the Department of Justice and, therefore, remain advisory.

Planning and Design Requirements

Section 504 and IDEA contain two concepts that affect the planning and design of facilities used by students with disabilities. The first concept—*appropriate education*—requires that schools provide all students receiving special education services with an individualized education program (IEP). The IEP specifies the levels of performance, goals, and educational services to be provided and the extent to which students will participate in general education programs. Appropriate education has no statutory or regulatory definition and is, therefore, decided on a case-by-case basis. Court decisions and other rulings suggest a two-part analysis can be made to determine appropriateness: Were the procedural requirements set forth in IDEA met, and did the IEP benefit the student?

The second concept—*least restrictive environment*—requires students with disabilities to be placed where they can obtain the best education at the least distance from mainstream education programs. To the maximum extent possible, they must be educated with nondisabled students. Students with disabilities who are not initially placed in the public school district or in a general education public school should be integrated into the appropriate public school as soon as possible.

The interpretation of federal regulations concerning the proper placement of students with disabilities has changed. Placements acceptable in the 1970s and 1980s are now considered too restrictive. Many students who previously would have been placed outside the general education classroom, their neighborhood school, or even their public school district have been moved to less restrictive environments.

More students with disabilities have become the primary responsibility of the general education classroom teacher. In its most recent report to Congress on the implementation of IDEA, the U.S. Department of Education reported that between the 1988–89 and 1997–98 school years the number of disabled children spending 80 to 100 percent of their instructional time in the general education classroom grew from 30 to 46 percent, while the number of students placed in separate public or private facilities dropped from 5 to 3 percent (Office of Special Education Programs 2000, table AB8).

Placing more severely disabled students in general education elementary and secondary schools and classrooms has tended to improve the overall quality of education because special education traditionally has been characterized by the best in educational techniques and methods. These attributes include early and continuous intervention, individualized education programs, parent involvement, in-service training, differentiated staffing, and interagency cooperation, which, by virtue of being integrated into the general education setting, are having the residual effect of improving general education programs.

Planning and Design Principles

The following planning and designing principles should be considered when building or renovating school facilities.

Provide versatile classroom spaces. Classrooms that provide a variety of choices in the physical environment are preferable for all educational programs but are indispensable for meeting the wide range of educational requirements for students with disabilities and for helping them become successful learners.

For example, students with attention deficit disorders and emotional disabilities often require greater physical and acoustical separation between activities to reduce distractions, making single-space classrooms inadequate for their needs. A more appropriate arrangement consists of a large common classroom area, an alcove off the classroom, and a small room adjacent to the classroom that is acoustically isolated but visible from the common classroom area. Varied ceiling heights can further define separations and help control sound from one space into another. An alcove adjacent to a classroom, for example, could have a different ceiling height than the main space.

Modular furniture can also provide versatility. Student worktables that can be combined or separated to support a variety of activities such as individual work, small group projects, and full class discussions are particularly useful. Data outlets should be located throughout instructional spaces, not clustered. This arrangement provides maximum flexibility for using instructional technology.

Versatility should not be confused with flexibility, which, while good in concept, often results in generic, single-space classrooms with uniform ceiling heights, lighting, and acoustics. While such “flexible” spaces may accommodate many functions, they do not serve any one function well. Versatility, on the other hand, makes a commitment to providing greater variety in the classroom’s physical environment and, in practice, provides the most flexibility for both teaching and learning.

Use universal design. In schools, universal design means accommodating, to the maximum extent possible, people with temporary or permanent changes in mobility, agility, and perceptual acuity. With the increase in both the number and severity of students with

disabilities, universal design becomes an important design principle for school architecture.

Design requirements for people with disabilities are often the same as for people without disabilities. During the design and construction process, however, requirements can be compromised by economic constraints, aesthetic considerations, and other forces. The average person may be able to adapt to such compromises, but persons with disabilities may not.

Universal design dictates that school furniture should maximize comfort and minimize the potential for injury, eye fatigue, and distractions by being free of protrusions and having rounded edges and nonglare surfaces. Likewise, pedestrian walks, bus circulation, car circulation, service deliveries, and parking should be physically separated. The clear delineation of these traffic patterns enhances everyone's safety. Pedestrian routes, including those to and from parking areas and bus loading and drop-off areas, should be well lit during dark hours. Points of transition such as steps, ramps, intersections, and entry doors need special attention as well.

Universal design also supports the use of schools as community centers throughout the school week and on weekends. As school-based programs attract a wider range of people, from pre-school children to senior citizens, those with disabilities will find universal design more accommodating.

Minimize travel distances. The distance students travel from one destination to another is an important consideration in any school facility. For students with disabilities, it is even more important. The time it takes them to proceed from one location to another can be significantly greater than for nondisabled students. Physical education, music, art, the library, food services, and elevators should be centrally located and never placed at the far ends of the building. Multistory buildings may require more than one elevator to provide reasonable travel distances for disabled students.

Integrate general and special education programs. Special education spaces should not be clustered or isolated in a single area of the building. While some special education functions clearly need to be adjacent or in proximity to one another, the balance should be dispersed throughout the school (while keeping travel distances in mind). Administrative spaces, teachers' planning rooms, dining, and lounge areas should serve both general and special education staff.

Provide for parental involvement. While parental involvement is important for all students, it is critical for students with disabilities. Parent participation is required by special education regulations in decisions concerning their children's IEP. They also spend time meeting with administrators and staff, observing their children, and volunteering.

Reserve a special room for parents so that they may relax between volunteer activities, plan for and participate in meetings, store coats and belongings, partake in refreshments, and socialize. The room should contain space and wiring for computers and a printer. Provide parking spaces specifically for parents. This distinguishes them from visitors and places them on the same level of importance as staff.

Parents should be able to reach school staff easily by telephone and e-mail. Every instructional and support space should have telephone and data outlets. Schools should be equipped with a teletypewriter (TTY) to provide those with hearing impairments a means of communication if e-mail is not available.

Maintain student dignity. School planners and designers should always consider ways of maintaining the dignity of students with disabilities. Accommodations should avoid separating them from their peers in instructional settings, drawing unusual attention to them, or limiting their educational opportunities.

- Accessible lab stations should not be separated from other stations in science, technology education, and other classrooms. Rather, accessible features should be integrated into one or more centrally located lab stations, allowing the students who use them to participate fully in group activities.
- Accessible seating in auditoriums, lecture halls, and sports facilities should not be isolated or located in inconvenient places. Instead, the primary objective should be to offer disabled students the ability to view and participate in activities fully, as required by ADA.
- The health suite should meet the wide range of medical services students with disabilities need. Activities like changing colostomy bags, administering medication, and providing treatments to improve breathing may require adding a private examination room.

Provide the least restrictive placement. One of the most difficult school planning and design decisions is how to provide students with disabilities, particularly those at the higher severity levels, the least restrictive environment. The primary factor influencing this decision will be the IEP. Unless the IEP dictates otherwise, students should be educated in the schools they would attend if they did not have a disability. The courts, however, have ruled that a student with a disability does not have an absolute right to be placed in his neighborhood school. Rather, IDEA indicates only a *preference* for the neighborhood school, allowing a school district some latitude in determining the best location for a student among several alternatives. The courts have recognized that proximity to one's home is only one factor, with the effective use of limited financial and educational resources being another.

Larger school districts with significant numbers of elementary and secondary school buildings have more placement options, including providing age-appropriate settings. About 90 percent of all school districts, however, have less than 5,000 students. In a small district with few facility options and limited financial and educational resources, the limited number of students with disabilities can make student placement decisions difficult.

For example, in a small school district with one high school, one middle school, and several elementary schools, providing limited services to students with low levels of disability may be accomplished in the same school they would attend if they did not have a disability. Students with moderate disabilities may best be served at only one of the elementary schools (not necessarily their neighborhood school) and at the middle and high schools. Providing services for students with severe disabilities is the most difficult task. Although the number of these students is small, the services are intensive and staff and facilities must be specialized. One solution might be to provide special facilities at one pre-K through 8 school and at the high school. Another might be to provide special facilities at one of the elementary schools and send middle and high school students to a special regional facility serving several school districts.

This illustrates the difficult choices in implementing the least restrictive placement concept, particularly for severely disabled students. Many factors must be considered, including the district's wealth, enrollment, and geographic size as well as the ability of the selected school buildings and sites to accommodate capital improvements.

Future Challenges

Outdoor play areas. Frequently, playgrounds in elementary schools are not useable by students with disabilities. Students with mobility problems or in wheelchairs cannot easily traverse playground surfaces, and play equipment may not be easily accessed or used.

New federal guidelines address the components that must be accessible, the kinds of acceptable play surfaces, requirements for wheelchair maneuvering, the height and clearances of play tables, and the like. Although the guidelines (available at *http://www.access-board.gov*) have not been adopted by the U.S. Department of Justice at this time, they should be used as a guide in the interim.

Natural environment study areas. More school sites are conserving and developing the surrounding natural environment for educational and environmental purposes. Wetlands are being created for storm water management and as an educational resource that students and teachers can visit, study, and incorporate into the school curriculum. Meadows, in lieu of turf, are being allowed to flourish, providing schools with a rich study area and reduced maintenance costs. Some areas are being reforested and paths are being developed for pedestrian and bicycle access. Planting beds are being constructed so students may plant vegetables, flowers, and other growth that supports the school's programs and learning objectives.

The challenge is to design these natural features so students with disabilities may use them. Pathways through the site should allow students to observe and actively study natural areas. Path surfaces should be stable, firm, and slip resistant while harmonizing with the surroundings. In wet areas, raised boardwalks can serve as an accessible route.

Some planting beds should be raised so students in wheelchairs may have access. Raised beds meet the intent of ADA while remaining accessible to students without disabilities.

Classroom acoustics. A significant number of school-aged children have hearing impairments. Between the 1988–89 and 1997–98 school years, the number of hearing impaired students who spent 80 to 100 percent of their instructional time in the general education classroom grew from 27 to 39 percent (Office of Special Education Programs 2000, table AB8). Moreover, many otherwise healthy students suffer transient hearing

losses from ear infections, colds, and allergies so the number of elementary school-aged children with hearing difficulty can be significant on any one school day.

A national acoustical standard is being developed that may include fairly stringent background noise requirements for classrooms serving students with hearing impairments, attention deficit disorders, emotional disabilities, and multiple disabilities. With the increasing numbers of students with disabilities placed in general education classrooms, the requirements may become commonplace.

Background noise requirements have many implications for classroom design. Central heating, ventilating, and air conditioning systems, for example, will become the system of choice over the commonplace but often noisy classroom unit ventilator. Noise criteria will affect the number and location of air supply diffusers, the design of duct work, fan selection, and equipment location. Sound transmission through windows and exterior and interior walls will receive closer scrutiny. In addition, classrooms will have to be acoustically designed to allow simultaneous activities to take place and still serve the needs of students with hearing impairments.

Building security. Much attention is paid to keeping unauthorized individuals from entering our schools. Keeping students with disabilities, such as autism and emotional disabilities, from *leaving* the school building is also a problem. Between the 1991–92 and 1997–98 school years, the U.S. Department of Education reported a 318 percent increase in the number of children with autism alone (Office of Special Education Programs 2000, table AB8). Such students have a greater propensity for leaving the school building unsupervised and risking harm to themselves. The careful placement of school entries during the design process minimizes the potential for student flight.

Access to areas within the school building that pose a potential threat of injury to these students is another building security issue. Areas such as mechanical and storage rooms with potentially dangerous equipment or supplies require special consideration.

Classroom design. Although the majority of learning occurs in the classroom, the design and planning process frequently places disproportionate attention and resources on noninstructional spaces (such as main entrances, student commons, cafeterias, and corridors) while ignoring the classroom—its spatial characteristics, finishes, lighting, and acoustics. As more students with disabilities become the primary responsibility of general education classroom teachers, shifting more money into classroom architecture will be a necessity.

Indoor air quality. The need to protect student health and the recognition that poor indoor air quality can affect the learning process has increased the pressure on school districts to better manage air quality. Students with disabilities are often the most vulnerable to poor indoor air conditions. As more of them enter general education schools, close attention to indoor air quality has become mandatory.

Heating, ventilating, and air conditioning systems should control humidity, eliminate contaminants at their source, incorporate high efficiency air filters, and be easily inspected and cleaned. It is best to select construction materials that eliminate or dramatically reduce the emission of volatile organic compounds.

In Conclusion

The influx of children with moderate, severe, and profound disabilities into general education schools is having a positive impact; by addressing the needs of students with disabilities and raising the bar for school design, all students benefit from higher quality educational facilities.

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Additional Information

See the NCEF resource list *Accessibility in Schools,* online at *http://www.edfacilities.org*

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