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ABSTRACT

Three reports on technology in special education identify major trends, describe availability and characteristics of adaptive hardware, and report on special education costs and demographic data. The first report notes the continuing interest of the Federal Government in technology, the changing federal policy toward hardware acquisition, and such special education legislation as Public Law 94-142 (which assures appropriate public education for all handicapped children, Public Law 99-457 (which authorizes spending on technology and educational media) and Public Law 100-407 (which provides delivery systems for information and assistive devices). Critical issues identified include maximizing private and public sector initiatives; improving communication among developers, producers, and consumers; and translating research on effective applications into practice. The second report provides statistical data on the availability of adaptive hardware; proportions of devices that are assistive, computer input, or computer output devices; device functions; and design features. The final report presents data indicating that the population of students with handicaps (especially learning disabilities) is rising. It notes that federal funds constitute about 5% of total special education expenditures and that costs for educating handicapped students run about double the costs of educating regular students. The last report also discusses the educational environments of special students, related services, percentages of students exiting from secondary schools, and special education personnel. (DB)

Center for Special Education Technology

The Marketplace

Report on Technology in Special Education

September 1988 Volume 1 Number 1

TRENDS '88: FEDERAL COMMITMENT HIGH

Special Education - A Leader in Technology

The Office of Technology Assessment (OTA), a nonpartisan analytical agency of the Congress, released a new report to the Education and Labor Committee of the U.S. House of Representatives on the role of microcomputers and other technologies in education. They found that after a decade of experience, some of the best examples of how interactive technologies spur major improvements in education are occuring with students who have handicaps. "Innovative projects include braille word processors for the blind, specially designed materials for teaching English syntactic structure to improve the reading and writing skills of the deaf, and synthesized speech generated by touching graphics tablets" that enable students "with little or no capacity for oral language to communicate" (OTA, 1988). OTA calls for the Congress to support additional research, development, demonstration, and evaluation in both regular and special education technology.

Freedom Machines

Teachers cited in the OTA report felt that technology serves as a "freedom machine" that can "open the door to educational pathways previously inaccessible to handicapped or learning disabled students." For special needs students, they say, adaptive devices increase access to learning and provide new ways to acquire information and communicate. "Word processors allow students who could not hold a pencil to write; speech synthesizers provide some students with a means to communicate orally for the first time. Moreover, for trained teachers with access to appropriate information, computers can be powerful teaching tools for special education students."

> **Freedom machines...** *"open the door to educational pathways previously inaccessible to handicapped or learning disabled students."*

Federal Interest In Technology Spans Three Decades

Federal education programs for handicapped students have contributed to the advancement of technology in special education for over three decades. The nature of the legislation has permitted schools to purchase technology in two ways, through P.L. 94-142's state grant program and through the discretionary funding programs under the Education of the Handicapped Act.

P.L. 94-142

The Education for All Handicapped Children Act of 1975 (EHA Part B) assures appropriate public education for all handicapped children. Federal funds are allocated to each state through a grant program to assist with excess cost of educating students with disabilities.

Beginning in the 1960's, through HEW's Bureau of Education for the Handicapped (BEH) in the U.S. Office of Education, many "significant" R&D projects "opened new learning opportunities for the handicapped" (OTA, 1988). These included closed captioning of television, development of the OPTACON for the blind, and support for the development of the Kurzweil reading machine. Subsequent funding also helped to support dissemination of the devices. In addition, BEH supported "a computerized database on instructional materials for the handicapped; studies of reading and mathematics computer assisted instruction (CAI) materials for deaf and hearing impaired students; and demonstrations of electronic mail for communication with the deaf" (OTA, 1988).

The U.S. Department of Education's Office of Special Education Programs (formally BEH) has continued studies of computer use for handicapped students, with followup projects that developed a variety of applications including hardware, adaptive devices, and special education software. Dissemination efforts were designed "to bring research findings and development efforts to schools and the special education community" (OTA, 1988).

Exceptional But Still Emerging

OTA found that accomplishments in special education technology are exceptional when compared with general education technology. But, despite strengths in special education technology, those benefits have not routinely been translated to exceptional students to the degree desirable, since ". . . many special education teachers (and classroom teachers who have disabled students mainsteamed in the regular classroom) are not yet aware of what is available and what is possible. The educational system was found to provide few if any incentives or rewards to teachers who went out of their way to see that their special education students have equal access to computers" (OTA, 1988).

Changing Federal Education Policy

Accessibility appears to be a broad-based problem for all students. There is wide variation in computer availability across districts and states and between relatively poor and more affluent schools. In a recent report, Congressional Research Service (CRS, 1988) suggested such problems stem from the absence of a coordinated federal policy, limited and short-term funding, erratic political support and disorganized research and development efforts.

While charging that federal support for computer applications in schools "appears to be diffuse and uncoordinated," CRS did cite noteworthy exceptions and credited the U.S. Department of Education for its work in special education technology. Federal handicapped programs stand out because in the past legislation has permited schools to acquire instructional materials, including microcomputers, without specifically authorizing it. During the last decade, however, Congress specifically began defining instructional equipment and materials as including hardware and related expenses. This trend made "explicit the authority that many school systems had already found in some current Federal education programs" (CRS, 1988).

New Special Education Legislation

P.L. 99-457

Among more recent legislation, the Education of the Handicapped Amendments of 1986, P.L. 99-457, authorizes spending on technology, educational media, and materials. The legislative committee report accompanying the law discusses the logic behind Congress' actions:

"The Committee is greatly impressed with the efforts that are taking place in the application of technology, media, and materials in the education of handicapped children and youth. The technological advances of recent years,

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including computers, microprocessors, videotapes and discs, information and communication systems, robotics, and augmentative devices, have not only opened opportunities for improving the education of handicapped children never before envisioned, but also presented problems in assuring their appropriate effective application. The Federal government, under part F of the (Education of the Handicapped) Act, has played a long and significant role in this area and the Committee commends the Department's efforts in this regard."

"In creating a new part G it is the Committee's intent that the projects and centers funded under this part be primarily for the purpose of enhancing research and development advances and efforts being undertaken by the public or private sector, and to provide necessary information linkages to make more efficient and effective, the flow from research and development to application." The law also provides for training of a broad range of personnel serving students with handicaps on the application of new technology.

P.L. 99-457

This act amends the Education of the Handicapped Act by creating Part G to assist the development and advance the use of new technology, media and materials in the education of handicapped students and early intervention for infants and toddlers. Goals include enhancing availability, improving quality and encouraging the appropriate use of technology.

Critical Issues

Identified as critical issues by the committee were:

- Maximizing private and public sector initiatives;
- Improving communication among developers, producers, and consumers;
- Affording handicapped children greater accessibility to exisiting media, materials, and technology;
- Designing systems and techniques for more effective management and maintenance of specialized technology;
- Evaluating the appropriateness of media, materials, and technology before purchases are made; and
- Translating research on effective applications into practice.

P.L. 100-407

The 100th Congress generated new excitement for special educators and others when it passed and funded legislation that establishes a program of grants to states that will help bring technologies to persons with disabilities. This law, P.L. 100-407, known as the Technology-Related Assistance For Individuals With Disabilities Act of 1988, was signed on August 19, 1988. First year funding at $5 million will enable a maximum of ten states to plan and set up delivery systems providing consumers, including students, with information and assistive devices. Twenty states will become eligible for funding in the second year and the remaining states thereafter.

P.L. 100-407

The primary purpose of the Technology-Related Assistance for Individuals with Disabilities Act of 1988 is to assist states develop and implement consumer-responsive statewide programs to provide disabled individuals with information about assistive technology devices and help them obtain these devices as needed.

Now in a planning stage within the Office of Special Education and Rehabilitation Services (OSERS), regulations will be drafted and details of component grant programs and demonstration projects worked out in the coming months. Meanwhile, the National Council on the Handicapped will gear up to study current laws facilitating or impeding the financing of assistive technology devices and services. Moreover, within 18 months, it will make recommendations to the Executive Branch and the Congress on matters of administration and legislation.

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The Marketplace

Report on Technology in Special Education

September 1988 Volume 1 Number 2

ADAPTIVE HARDWARE '88

Product Availability High for Physically Handicapped

During its first year of operation the Center for Special Education Technology has collected and synthesized data on hardware products available for special education populations. Data on adaptive hardware devices were collected by type of device, specific function, intended disability groups, and other hardware or software requirements for using the device. Figure 1 illustrates the proportion of available products found to be appropriate for each disability area. The physically handicapped populations have the largest number (43%) of devices available to them. Communication disordered (15%) and visually impaired (13%) are the two other populations with significant numbers. The populations with the least number of devices available to them are mild and moderate mentally retarded (4%), learning disabled (4%), and early childhood (3%). These numbers do not parallel the percentage of children within each disability group (U.S. Department of Education, Office of Special Education Programs, 1988). Physically handicapped only account for 2.5% of the school age disabled population while learning disabled account for 43.6%.

The Center has raised several questions that address the distribution of adaptive devices:

- Are there some disabled individuals who do not need special adaptive devices?
- Have research and development efforts lagged for the mildly retarded and learning disabled populations because there are no potential devices for these populations or because other populations have merely had greater priority?
- Have disabled individuals who cannot access computers without adaptive devices had development priority and will they in the future?
- Has there been more development for the physically disabled populations because more disciplines have been involved over a longer period of time (e.g., rehabilitation, education)?
- Are devices that are developed for one disability group used by another group but not counted in that group?

The data source for this analysis was the Center's database of adaptive devices. In order to be included in the database the product had to have been identified by other sources as useful or potentially useful for special education populations. Sources of information included special education technology journals and newsletters,

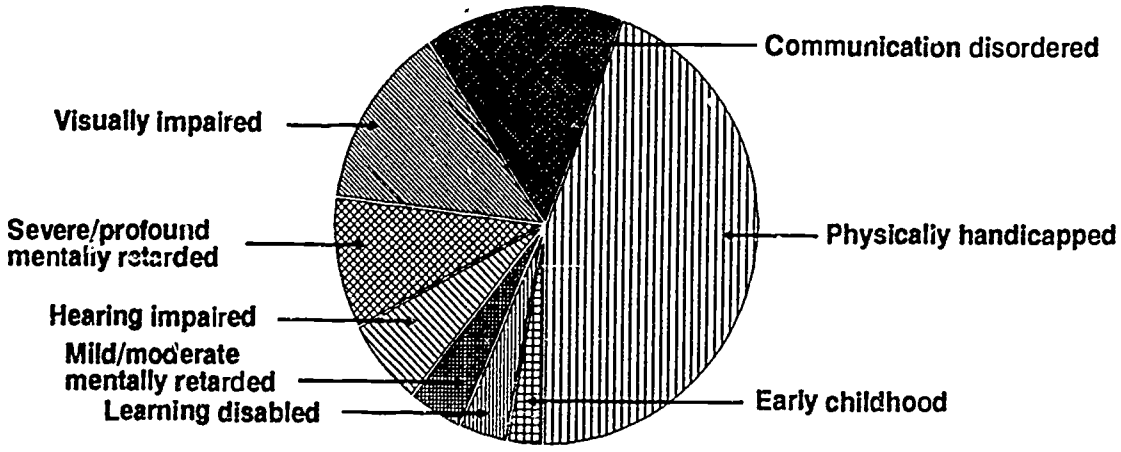

Figure 1: Frequency of Adaptive Devices for Each Disability

information sheets compiled and distributed by other organizations, and published product listings. At the conclusion of the first year the database holds information on 670 hardware products. These products have been verified by the vendors as available and accurately described. Because the product's appropriateness for use in special education has not yet been verified, interpretation with caution is strongly urged. The data should be treated as a preliminary description of products available for special education.

Assistive Devices Most Common

Adaptive devices come in all shapes and sizes. The Center groups these devices into three major categories: assistive devices, computer input devices, and computer output devices. Table 1 illustrates the frequency of devices by these categories. Some devices fit into more than one category and thus the numbers shown in Table 1 total more than 670.

Assistive devices are defined by the Center as devices that allow the user to complete a specific task by modifying the conventional method of performing the task or bypassing the conventional method through an alternative method. Computer input devices provide modified or alternative methods of entering data into a computer or microprocessor-based device. They are specific to data entry and not to the task being completed. Similarly, computer output devices provide modified or alternative methods for receiving information from a computer or other microprocessor-based device and are not specific to a task.

Assistive devices outnumber computer input devices nearly two-to-one. Computer output devices fall even further behind. The table shows that the physically impaired population is the group most served by assistive and computer input devices. The visually impaired population has the largest showing of computer output devices.

Table 1
Frequency of Adaptive Devices by Type and Disability

Category Of Device	Handicapping Condition A	C	D	E	H	L	M	P	S	V	TOTAL
Assistive devices	7	102	6	14	57	27	23	225	50	69	580
Computer input	13	24		10	1	5	14	187	38	16	308
Computer output		15		2	1	3	1	3	4	44	73
TOTAL	20	141	6	26	59	35	38	415	92	129	961

Device Functions

Table 2 breaks down adaptive devices by more specific functions. Within the assistive device category, communication devices outnumber other devices across all disability groups. Devices that assist in basic living are the next largest group. Book/paper handling and mobility aids are the two smallest groups of devices.

Table 2
Frequency of Devices by Subtype and Disability

Subtype of Device	Handicapping Condition A	C	D	E	H	L	M		S	V	TOTAL
ASSISTIVE DEVICES											
mobility				1				9		4	14
communicatic '	2	95	1	2	31	7	7	77	24	14	260
environ. contro		7		4	2		3	96	21	1	134
book handling								7	1		8
pointing aid	6	7		4		6	7	43	9	10	92
calculation aid		2			2	3		2		7	16
vision aid			3		1	9	1			27	41
basic living	1	11	3	6	40	6	9	44	8	17	145
COMPUTER INPUT											
input adaptor	2	3		5			2	22	2	1	37
switches	1	20		2			6	137	39		205
keybrd. emulator		6	3					11	1	1	22
modified keybrd.	1	5		4		1	4	28	5	6	54
mouse/touchpad/ joystick emulator				1		4	3	19	2		29
voice recognition		8			1		1	27	2	8	47
optical char. reader										1	1
infrared receiver				1		1	1	5	1		9
digitizer		10									10
COMPUTER OUTPUT											
braille display			2			2				23	27
large print					1	3				11	15
synthesized spch.	28		1		5		10	6	36		86
telecomm.		6			15			3		4	28
security systems								2			2
infrared transmitter				1		1	1	5	1		9

Table 1 and Table 2:
Key to Handicapping Conditions

A = all disabilities
C = communication/speech
D = deaf-blind
E = early childhood
H = hearing impaired
L = learning disabled
M = mild/moderate mentally retarded
P = physically impaired
S = severe/profound mentally retarded
V = visually impaired

Computer Input Devices

Switches far outnumber other computer input devices. While this number may first indicate a wealth of computer access options, most switches are similar to each other but produced by various vendors. Notably, newer emerging technologies have not yet found their way into the special education market. Currently, there are very few optical character readers, infrared light, and digitizing devices available.

Computer Output Devices

The computer output category is dominated by speech synthesizers and it spans across the majority of disability groups. The majority of devices, however, assist the visually impaired populations and include braillers and large print screens in addition to speech synthesizers.

Design Features

In a future report, the Center will examine desirable design features for adaptive hardware. The reader also is referred to a newly released report from the Design Considerations Task Force (1988). It provides a consensus on what design features should be considered during adaptive hardware product development.

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Center for Special Education Technology

The Marketplace

Report on Technology in Special Education

September 1988 Volume 1 Number 3

SPECIAL EDUCATION COSTS & DEMOGRAPHIC DATA

The federal Office of Special Education Programs (SEP) has released data that show the population of students with handicaps is once again on the rise.

Demographic information citing the increase was made available in SEP's latest report to Congress (the Tenth Annual Report to Congress on the Implementation of the Education of the Handicapped Act) in which the U.S. Department of Education noted the 1986-87 school year was marked by overall growth by 1.2 % in the numbers of handicapped students served over the previous year. This is the highest rise since 1982-83 (See Table 1). In addition, the largest category of students served, learning disabilities, also showed its greatest growth since 1982-83.

Table 1
Number and Change in Number of Children Age 3 to 21 Years Counted Under EHA-B and Chapter 1 of ECIA (SOP) from School Year 1982-83 to 1986-87

School Year	Percent Change from Previous Year	Total Served	EHA-B	ECIA (SOP)
1986-87	1.2	4,421,601	4,166,692	254,909
1985-86	0.2	4,370,244	4,121,104	249,140
1984-85	0.5	4,362,968	*4,113,312	249,245
1983-84	1.0	4,341,399	4,094,108	247,291
1982-83	1.5	4,298,327	4,052,595	245,732

* Beginning in 1984-85, the number of handicapped children reported reflects revisions to state data received by the Office of Special Education Programs following the July 1 grant award date, and includes revisions received by October 1. Previous reports provided data as of grant award date.

Source: U.S. Department of Education, Office of Special Education Programs, 1988.

Under a separate initiative, SEP has received preliminary data on special education expenditures that are based upon the first in-depth collection effort in nearly a decade. Findings confirm that handicapped students are about twice as expensive to educate as regular education students. Exact costs can vary considerably, however, by disability, type of program, and provider. A draft of these findings was recently submitted to SEP by the Washington, DC-based Decision Resources Corporation (DRC) to fulfill requirements in the 1983 education amendments. Congress hopes the study will help states answer current cost questions and be useful to local districts as they gauge their response to mandates for providing a free appropriate education under the Education for All Handicapped Children Act, P.L. 94-142. Information was collected in 60 school districts located in 18 states during the 1985-86 school year.

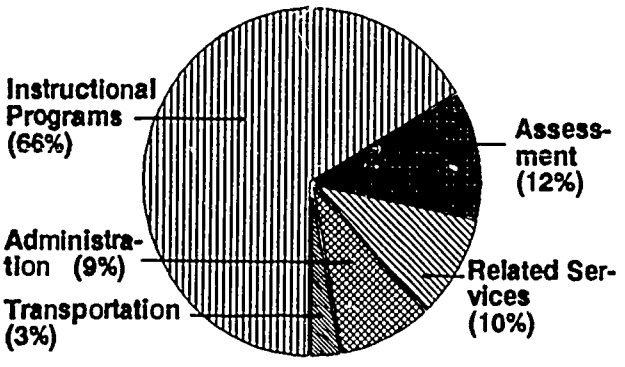
The report entitled "Patterns in Special Education Service Delivery and Cost" does not report on monies spent for technologies in special education, but does shed light on numerous aspects involved in educating students with handicaps.

Preliminary Data From The DRC Expenditures Study

A final report on the expenditures study is expected around January, 1989. The following are highlights of preliminary information reported thus far:

- Federal funds constitute about 5% of total expenditures for special education in school districts. During school year 1985-86, special education spending totaled some $18 billion or 11% of all expenditures for elementary and secondary education.
- Nationally, the greatest percentage of P.L. 94-142 funds at 66% pay for instructional programs and services (see Figure 1). Most dollars support self-contained programs and resource rooms serving children five through 21 years. The next highest costs at 12 % are associated with assessment of youngsters, while related services account for 10% of the expenditures.
- District wealth appears unrelated to per pupil expenditures. The wealthiest one-third of districts do not spend more per pupil than other education agencies. Poorer districts appear to have higher per pupil expenditures.
- Costs for educating some 11% of the nation's students, those who have handicaps, runs about double as compared with educating regular education stu-

Figure 1
Distribution of Special Education Expenditures by Major Component



Source: U. S. Department of Education, 1988.

dents. In 1985-86, the average per pupil cost of regular education was $2,780. Excess costs for special students averaged $3,649. Depending upon the formula used, researchers put special education at 2.0 or 2.3 times the cost of providing regular education. Special education costs vary considerably, however, by disability, type of programs, and program provider. Higher costs are associated with educating more severely impaired students.

- During the eight year period from 1977-78 to 1985-86, special education spending grew by 10%, while regular education spending increased by only 4%.
- There are notable differences in the way regular and special education dollars are spent. Special education pays some 10% for related services to regular education's 3% for pupil services. Transportation consumes a large proportion of regular education spending. At 66%, states spend a greater share of special education monies for instructional programs than regular education which spends 54%. Regular education, which also benefits students with handicaps, spends 35% on admininstration, while special education spends only 9%.

Handicapped Students Served Mark An Increase

During school year 1986-87 with an overall increase of 1.2%, some 4,421,601 children between the ages of 0 and 21 received services under two federal education programs: the Education for All Handicapped Children Act (EHA), P.L. 94-142, and the Education and Consolidation Improvement Act (EICA), Chapter I, State Operated Programs, commonly called P.L. 89-313 by special educators. This year's annual findings were sent to Congress in the Tenth Annual Report that describes how P.L. 94-142 is working.

As in past years, the largest handicapping categories served were learning disabled, at 43.6%, and speech impaired at 25.8%. Counts for students classified as mentally retarded and emotionally disturbed followed in rank order at 15.0% and 8.7%, respectively.

Continued Growth in Learning Disabilities

Nationally, the learning disability category showed growth over the previous school year by 53,758 students (see Table 2). Meanwhile, some 21,653 fewer students were reported as mentally retarded. Reclassifications from one category to the other did not account for the changes, according to the Education Department.

Table 2
Change Between 1985-86 and 1986-87 in Number of Children Counted Under Chapter 1 of ECIA (SOP) and EHA-B by Handicapping Condition

Handicapping Condition	Change 1985-86/1986-87 Number	Percent
Learning Disabled	53,758	2.9
Speech Impaired	11,951	1.1
Multihandicapped	9,715	10.8
Emotionally Disturbed	7,737	2.1
Deaf-Blind	-366	-17.2
Orthopedically Impaired	-672	-1.1
Hard of Hearing and Deaf	-1,652	-2.4
Visually Impaired	-1,977	-6.8
Other Health Impaired	-5,484	-9.4
Mentally Retarded	-21,653	-3.2
All Conditions	51,357	1.2

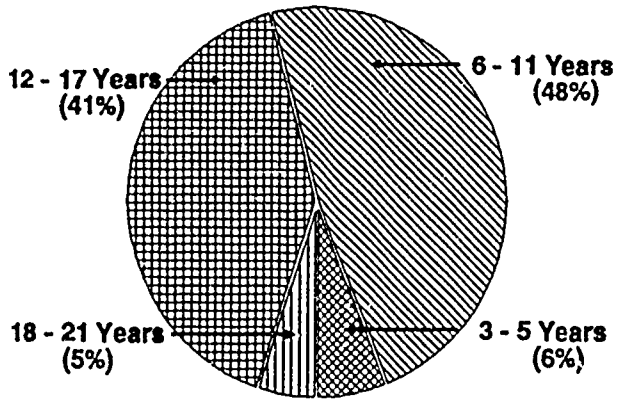
Source: U.S. Department of Education, Office of Special Education Programs, 1988

This notable 2.9% climb in the learning disability category follows lows of 1.5 and 1.8% increases per annum in 1983-84 and 1984-85. Other disabilities accounting for the overall increase in the national count were the speech impaired, multihandicapped, and emotionally disturbed. The greatest year-to-year percentage increase was in the multihandicapped category, at 10.8%. Between them, New Jersey and Wisconsin claimed nearly 20,000 more students with multiple handicaps over the previous year.

Mental retardation, a large category, fell by 3.2%, but was surpassed by a 17.2% dip in the deaf-blind category.

Disabling conditions of children varied considerably by age. A total of 48% of students counted as handicapped under P.L. 94-142 fell between six and 11 years. Another 41% between fell between ages of 12 and 17 years. Preschoolers and students over age 17 accounted for the remainder (see Figure 2).

Figure 2
Children Served Under EHA-B by Age Group, School Year 1986-87



Source: U.S. Department of Education, Office of Special Education Programs, 1988

Education Environments of Special Students

P.L. 94-142 requires students to be educated with mainstream students in the "least restrictive environment" that is individually determined to be appropriate. In school year 1985-86, "the majority of students with handicaps received special education and related services in settings with non-handicapped peers," according to Education Department figures (see Table 3). Of these, some 26% were educated in regular classes. Another 41% received assistance in resource rooms. Over 24% were served in separate classes in regular education buildings.

Special education placement patterns are known to vary considerably by handicapping condition. Students with learning disabilities or speech impairments most often are educated in regular classrooms or resource rooms. Nationally, some 56% of students classified as mentally retarded were placed in separate classes in public school buildings, as were 43% of the multihandicapped students.

Table 3
Percent of Handicapped Children and Youth Served in Six Educational Environments by Handicapping Condition During School Year 1985-1986

Handicapping Condition	Regular Class	Resource Room	Separate Class	Separate School	Residential Facility	Other
Learning Disabled	15.29	61.80	21.05	1.47	.08	.32
Speech or Language Impaired	66.26	25.55	5.54	2.33	.08	.23
Mentally Retarded	3.06	25.29	55.81	12.02	3.13	.68
Emotionally Disturbed	8.85	33.78	35.88	13.32	4.17	4.01
Hard of Hearing and Deaf	18.72	21.02	34.62	13.31	11.59	.71
Multihandicapped	4.06	15.25	43.23	28.52	5.00	3.91
Orthopedically Impaired	25.62	16.14	32.03	17.18	1.05	7.99
Other Health Impaired	25.88	18.79	25.77	7.80	3.83	17.93
Visually Handicapped	31.48	24.00	19.44	12.37	11.22	1.48
Deaf-Blind	6.55	17.68	23.30	15.10	35.97	1.40
All Conditions	26.26	41.39	24.49	5.43	1.34	1.10

Source: U.S. Department of Education, Office of Civil Rights, 1987.

Related Services Required And Needed

Under P.L. 94-142, related services must be provided if a student needs them to benefit from special education. There is variation among states in what constitutes a related service. In general, they include psychological; counseling and school social work services; occupational and physical therapies; audiological; recreational and diagnostic services; transportation; school health services and speech; and language pathology.

For several reasons, the Department of Education notes general concern about the quality of related services data reported by the states. In 1985-86, however the total number of related services in reporting states was 4,630,368 (see Table 4). The national average is 1.2 services per handicapped child.

Table 4
Total Number of Students Receiving Related Services by Type of Service During School Year 1985-86

RELATED SERVICE	STUDENTS RECEIVING SERVICES
Diagnostic Services	777,436
Counseling Services	620,262
Transportation Services	569,673
Psychological Services	557,119
School Social Work Services	472,785
Speech/Language Pathology	432,157
School Health Services	419,237
Recreational Services	215,435
Other Related Services	186,849
Audiological Services	184,817
Occupational Therapy	106,710
Physical Therapy	87,888
All Related Services	4,630,368

Source: U.S. Department of Education, Office of Special Education Programs, 1988

Diagnostic services were the most frequently used related service, followed by counseling, transportation, psychological services, school social work, and speech/langugae pathology. Learning disability, the largest category, accounts for the greatest number of related services counted.

Students Exiting From Secondary Schools

As the Department of Education moves into the second decade of administering P.L. 94-142, officials cite a "critical challenge" to ensure that more students with handicaps stay in school until graduation and leave with sufficient skills to be productive and contribute to society.

Data identifying the status of students with handicaps exiting from secondary school show that 60%, or a majority, of special students graduate from high school with a diploma or certificate of completion. Disabled students with visual, hearing, or orthopedic impairments are most likely to attain a diploma, while students with mental retardation, multiple handicaps, or deaf-blind students receive certificates.

During school year 1985-86, about 26% of students with handicaps exited from school by dropping out. Of these, a majority, at 47%, were learning disabled. Another 23% were mentally retarded and 21% were classified as emotionally disturbed.

Anticipated Services

Data on anticipated services is collected to help adult providers plan to serve handicapped students once they leave school. Over 523,000 services were counted as needed for 1986-87. One of these, "technological aids" was projected as needed for 1.9% of the students ages 16 years or older who were leaving school.

Students Awaiting Evaluation

Based upon a 1986 civil rights survey conducted by the Department of Education's Office for Civil Rights (OCR), over 1,700 schools claimed 10% or more of students enrolled required special education services. Most students were served within the school district, but some were placed in facilities not run by the school system. In districts with 10% or more of their students served in special education, some 43,828 children still were awaiting evaluation to determine if they qualified for special placement.

Special Education Personnel

During the 1985-86 school year, states reported an increase in special education personnel of approximately 6% over the previous year. Special education teachers numbered 291,954.

Meanwhile, some 27,474 additional teachers were needed to fill vacancies or replace uncertified staff. The greatest needs cited are for teachers of the learning disabled, mentally retarded, emotionally disturbed, and speech or language impaired.

Total increases for related services personnel employed edged up by .5%. Most of the increase was attributed to employing teachers aides. Another 13,720 staff other than special education teachers were reported as needed in 1985-86, with occupational and physical therapists being in greatest demand.

Cost Information Reported in the 10th Annual Report

In its annual report, the U.S. Department of Education informs Congress about state and local progress toward providing a free appropriate public education to students with handicaps under the Education for All Handicapped Children Act, P.L. 94-142. This includes information about federal and other expenditures under both P.L. 94-142 and the Education Consolidation and Improvement Act, Chapter I State Operated Programs, P.L. 89-313. Federal special education funds help to pay for the "excess costs" of educating students with handicaps.

Of the 5% federal monies used for special education, P.L. 94-142 funds account for some 91% of all expenditures at the school district level. ECIA, Chapter 1 pays for some 7%. These monies must supplement and not supplant state and local funds. Some 2% of vocational special education is supported with federal funding under the Vocational Education Act, Part B, but is not discussed in this report. Traditionally under these federal laws, technologies have been allowable expenditures.

Under the state grant program of the Education for All Handicapped Children Act (EHA), P.L. 94-142, states receive funds annually on the basis of a count of handicapped children, ages three to 21, reported by states.

Funding for EHA, part B, has increased from $251,770,000 in FY77 to $1,338,000,000, in FY87. The per child allocation jumped from $72 per child to $315 in those respective years. Under the law, 75% of the state grant funds are funneled to local school districts and intermediate educational units to provide direct services to children. The other 25% can be set aside to pay for administrative costs. Up to 20% of this allocation may go for direct and support services if the state chooses.

Historically, many states have passed "admininstrative" money back to local districts to support particular initiatives and service priorities. Some of these have included educating preschool children with handicaps, training personnel, and delivering technical assistance. Technology has played a role in some of these.

The Texas education agency, for example, has used its "flow- through" funds to develop a statewide adaptive and assistive device network that serves preschoolers with handicaps. A multidisciplinary team working through the state's regional resource system instituted a technology loaner program at regional education centers. Qualified handicapped students can receive equipment on loan, and professional staff assure the program works having been given both training and technical assistance. Funds also help to pay for public awareness activities that promote the program.

ECIA

The other source of funding comes from the State Operated Program under Chapter 1 of the the Education Consolidation and Improvement Act (ECIA). Over the years, the average per pupil allocation has grown from $243 in FY66 to $588 in FY87, however, payments depend upon the congressional appropriation.

A New Source Of Funding

In 1986, Congress instituted the Preschool Grants program in place of a preschool incentive grant program and offered increased financial incentives for providing services. All states and the District of Columbia are participating and therefore eligible to receive a two-part grant as a result of the Education of the Handicapped Amendments of 1986, P.L. 99-457.

For each child counted in the previous school year, age three through five, schools can receive up to $300 in FY87, $400 in FY88, $500 in FY89 and $1000 in FY90 and thereafter. Other money, based upon estimates, goes to pay for children previously not served. For each additional child served over the previous year, states could receive up to $3,800 in fiscal years 1987-89, so long as other criteria were met.

During 1987-88 all states received a basic allocation of $300 per child for each child who was receiving special education on December 1, 1986. States estimated an increase of 11% or 30,665 children would be served the following year. The range of estimates varied by state from six to 6,500 children. For each new child served, states received some $3,270 in FY87 funds.

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U.S. Department of Education, Office for Civil Rights. (December, 1987). 1986 Elementary and secondary schools civil rights survey: National and state summary of projected data. Washington, DC: Author.

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LEGISLATION

Education for All Handicapped Children Act, P.L. 94-142. This amendment to the Education of the Handicapped Act authorizes a formula grant program that gives federal monies to states to pay for the extra costs of providing special education and related services to students with handicaps.

Education Consolidation and Improvement Act, Chapter 1, State Operated and Supported Schools, P.L. 89-313. This authorizes federal aid to meet the specialized educational needs of children with handicapping conditions who are enrolled in state operated and supported programs.

Rehabilitation Act of 1973, Section 504. This affords persons with handicaps protection against discrimination in all federally assisted programs and activities. To fulfill its responsibilities under Section 504, the Office for Civil Rights in the U.S. Department of Education collects data on the number of handicapped students served in special education by disability category, special education needs and services by percent of enrollment, students identified as requiring special education, students awaiting placement, and figures relating to the amount of time spent in special education programs.

The Marketplace *is a series of reports produced by the Center for Special Education Technology to improve understanding about the market place for special education technology. Future reports in the series will include: software design features, hardware design features, new technology legislation, and state education agency involvement in technology.*

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