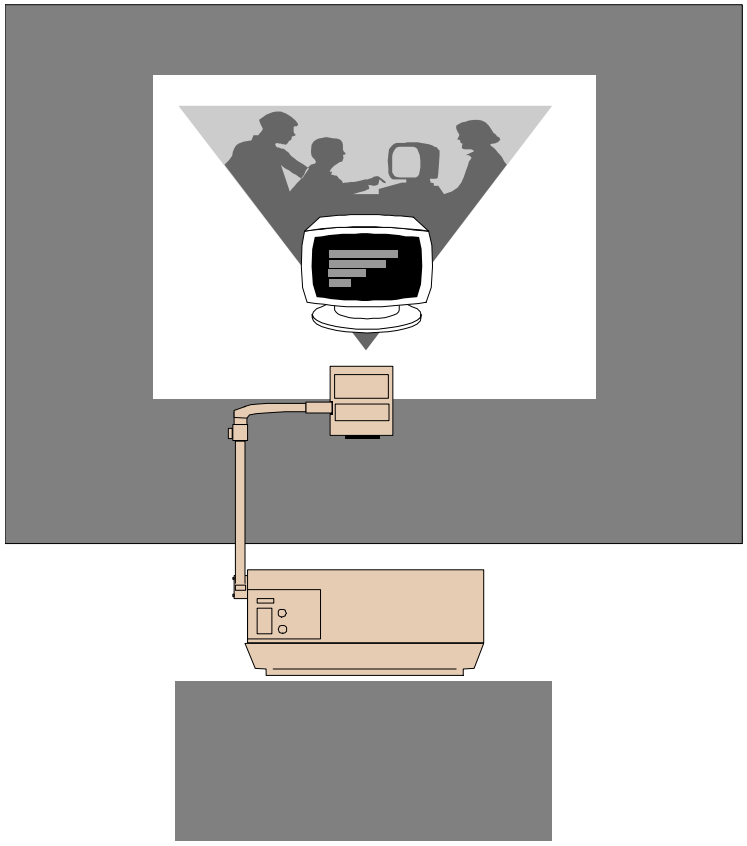
Assistive Technology Implementation: Priorities for K-12 Education in Canada



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Chapter I

Assistive Technology: Definitions and Directions

Assistive Technology (AT) is largely overshadowed by Information Technology (IT) in the rush toward technology implementation in today's school systems. Information technology has an increasingly important role in both the public and private sectors. One look in the careers and classified sections of our major newspapers provides evidence that information technology is an important component of the new economy. The number of recruitment ads for IT specialists shows that there is a steady demand in many industries for IT personnel.

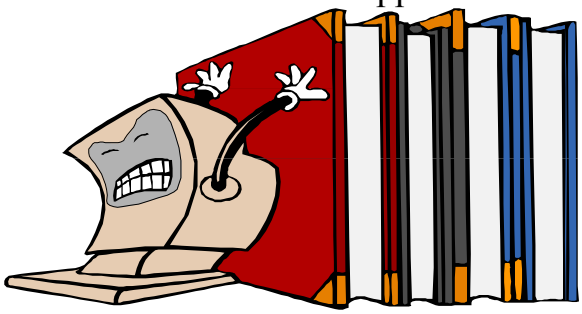
According to an Internet website ***Webopedia***, IT is defined as follows:

> Short for Information Technology, and pronounced as separate letters, the broad subject concerned with **all aspects of managing and processing information,** especially within a large organization or company. Because computers are central to information management, computer departments within companies

and universities are often called IT departments. Some companies refer to this department as IS (Information Services) or MIS (Management Information Services).[1]

Most schools and school districts in Canada have well-established IT structures, personnel and procedures.

If we focus on the highlighted portion of the IT definition **(…all aspects of managing and processing information…)** assistive technology (AT) could be considered as a lesser known sub-specialty of information technology. However, this would be an incomplete view of assistive technology. Assistive technology does relate to computer technology, but AT is not limited to computer hardware and software applications.



The official US legal definition of assistive technology is widely accepted by professionals in a variety of disciplines. Assistive technology is not only limited to educational applications. Some of the other professionals who work in the field of assistive technology include physical therapists, occupational therapists, rehabilitation engineers, orthotists, prosthetists, speech-language pathologists and audiologists.

Assistive technology is defined as any item, piece of equipment or product system whether acquired commercially off the shelf, modified, or customized that is used to increase or improve functional capabilities of individuals with disabilities.

-USA Public Law 100-407 Technical Assistance to the States Act

When the word *assistive* is entered into a word processor, the computer software (an AT device itself) will identify it as an incorrect word. In fact,

[1] www.pcwebopedia.com

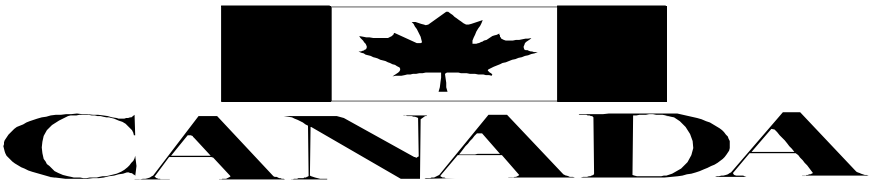
assistive technology is a relatively new term which has now gained legitimacy through the complexity of US legislation since 1988 making reference to it. Some of these laws are listed in the following chart:

- The Technology-Related Assistance for Individuals with Disabilities Act ("Tech Act") 1988. Public Law 100-407.
- "Tech Act" amended 1994. Public Law 103-218.
- "Tech Act" extended 1998. Assistive Technology Act - Public Law 105-394.
- The Americans with Disabilities Act 1990. Public Law 101-336.
- The Individuals with Disabilities Education Act 1997. Public Law 105-17.

This legal structure in the United States has spawned AT specialties in both health and educational disciplines. As well as creating new rules regarding technology rights for the disabled, it has led to corresponding legal specialization which in turn puts pressure on employers and school districts to comply with these laws.

Assistive technology implementation is now accompanied by comprehensive written policies and procedures in school districts throughout the US. According to US law, assistive technology must be considered when developing every student individual education plan (IEP). School districts in the US are required to supply AT to a student if the IEP determines that AT is necessary for the student to receive a "free appropriate public education" (FAPE).

US educators have clear rules that guide them toward connecting disabled students with technology solutions. This is not to suggest that AT service delivery is uniform from district to district. In fact, each state determines how it will establish AT services through its allocation of federal funding.



In Canada, the law is less clearly defined on the issue of technology rights for the disabled. Currently, we have a variety of provincial, district and school approaches to meeting the needs of disabled learners.

This lack of consistency in Canada means that some students are being well served in their classrooms, while others receive little or no technology support. Insufficient funding for special needs students has led to competition between special education programs for scarce resources. School district administrators find themselves in the impossible position of deciding which disability groups' needs will be given priority for funding. This can lead to political manoeuvering where parents form their own disability factions to lobby school officials for support. It is understandable that special education funding allocations tend to benefit the disability categories with the most politically astute and vocal parents. This situation is not likely to change in Canadian school districts without legislative leadership at the federal level.

There have been some high profile legal challenges in Canada regarding educational access for students with disabilities. One family was recently successful in challenging their school board as well as the BC Ministry of Education to provide compensation for the expense of removing their dyslexic son from the public school system and paying private school fees.

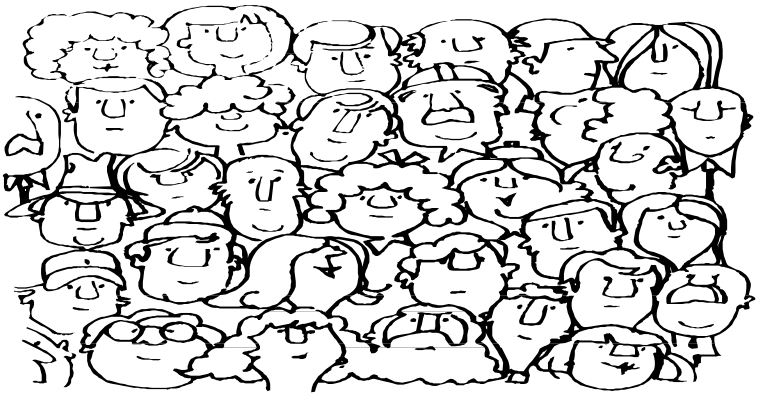
Part I Section 15 (1) of the Canadian Charter of Rights and Freedoms gives some protection to the disabled population.

> 15. *Equality Rights.* (1) Every individual is equal before and under the law and has the right to the equal protection and equal benefit of the law without discrimination and, in particular, without discrimination based on race, national or ethnic origin, colour, religion, sex, age or mental or physical disability.

However, there is no explicit federal legislation to determine a disabled student's right to assistive technology. Canadians often express frustration at the perceived interference of our government in burdening us with legislative red tape and higher taxes compared to our American neighbours. However, in the area of disability rights and assistive technology entitlement, it is clear that the US has "out-bureaucratized" Canada.

There are predictable educational benefits in the US which accompany these federal disability laws. Firstly, the legislation informs school districts across the US as to their responsibilities in addressing the technology needs of disabled students. The identification of students with disabilities and implementation of student IEPs become important risk management issues for administrators.

Secondly, parents and students are empowered through the Individuals with Disabilities Education Act (IDEA). As education consumers, they are likely to be aware of their rights under IDEA and have the ammunition they need to demand services.

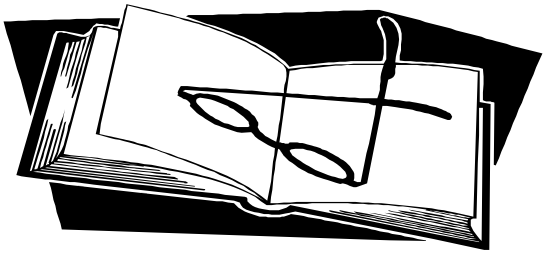


Finally, a spin off benefit is the continuous innovation in the assistive technology industry which serves the disabled population. The high tech sector has tremendous incentive to produce quality AT products for the education market. Assistive technology education specialists who network worldwide through Internet listserves and within their own regions share information on the latest AT developments. Again, consumers benefit from a wide selection of AT devices which help them compensate for their disabilities.

Collaboration between the AT industry and educators results in mutual benefits. The industry receives valuable feedback from teachers and students

for future product development. As well, educators assist this industry by informing the market about AT products and providing AT training to professionals, parents and students. The AT industry provides educators with a wide range of effective technology tools to meet the increasingly diverse needs of their students. With appropriate technology, disabled students experience gains in coping with their learning challenges.

Educators should understand that assistive technology is not a fad that will disappear in a few years. It will only continue to get better. Innovative developments and new technologies are leveling the playing field for people with learning differences. Teachers and administrators should be on the lookout for ways of incorporating assistive technology into their school technology plans. One way to ensure that assistive technology is not overlooked in the planning process is to educate teachers about the benefits of using AT.



Canadian teachers are fortunate to be able to observe the rapid implementation of assistive technology that is taking place in the American education system. Canadian educators have an important role to play in determining how assistive technology will influence education in Canada.

Chapter II

An Athletic Model

Improved access to learning is the principle at the heart of assistive technology implementation. The philosophy of inclusive classrooms is a laudable goal, however it presents a variety of challenges for the education establishment.

Government, education critics and tax payers are demanding accountability from public schools through comparative examination results and outcomes measurement. At the same time, schools are expected to foster inclusive practices and provide instruction for a variety of learning styles. The job of the classroom teacher has become increasingly complex. One beginning elementary school teacher remarked that she felt she needed an accounting background just to deal with the regular collection of funds for special projects, field trips and hot dog days. On top of these administrative tasks, today's classroom teacher works harder to cope with increasing demands for individualized instruction, learning strategies, alternative assignments and customized assessments.

Teachers are likely to resent the implementation of assistive technology if they see it as another level of complexity added to their existing demands. Teachers already work long hours preparing for their classes, attending meetings and organizing extracurricular events. Assistive technology, if it is to be supported by teachers, must assist classroom teachers as well as their special needs students. Technology tools that require teachers to expend more time and energy in using the devices with students are not going to be

viewed as learning "solutions." Every teacher has her own technology comfort level. Therefore, the attitudes and skills of both teachers and students need to be assessed when considering assistive technology implementation.

The job of selecting AT, training students and other personnel should be the responsibility of special educators. Special educators are well-positioned to analyze the needs of their colleagues and students. With assistive technology experience, they can provide an important service to other staff, students and parents. In order for special education teachers to achieve this goal, they need to take the initiative in learning about assistive technology or connect with colleagues who can share information with them.

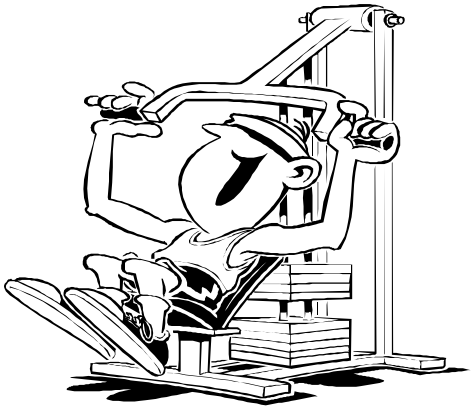
More and more online training is available for educators who want to advance their knowledge about assistive technology. An excellent website for teachers is the University at Buffalo online assistive technology training site. It provides a very good collection of learning modules and links to other helpful resources. Go to

www.at-training.com

Most US school districts promote a "team" AT approach, and this is generally recognized as the best method of achieving positive AT results for students. The team approach encourages multidisciplinary participation in the IEP process and AT consideration. This includes the participation of parents and the student to the extent that this is appropriate.

The team considers whether technology is necessary to allow the student to reach his/her potential or achieve grade level work. The objective is to facilitate greater independence and success than would be possible for the student without AT.

Although computerized AT in the classroom is regarded as a recent approach to learning at the academic level, other types of AT have been used in classrooms for decades. Books with large print, wide ruled loose leaf paper, pencil grips and tracing paper are some of the assistive tools that have been used by teachers for decades. In physical education classes and athletics, assistive technology has played an important role in opening up many sports to an impressive range of participants.

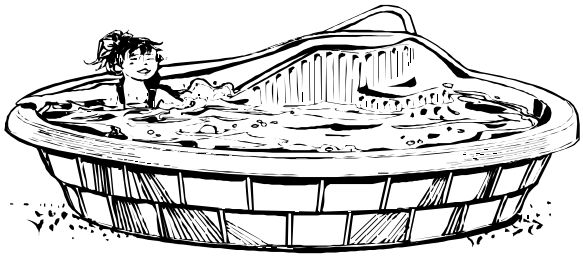


Teachers and coaches have employed adaptive devices and equipment to encourage participation and early success in the promotion of sport and recreation. Athletic skill development is taught in a sequential manner. As basic skills are mastered, the participant is able to advance to more complex tasks.

For example, a child learning to ride a bicycle is fitted with a bike frame that matches his own size. The seat height is adjusted carefully to match the

rider's leg length. Sometimes training wheels are attached to give the rider improved stability and confidence.

We would not expect a youngster to enjoy the experience of learning to ride a bicycle if he was provided with a bike that was four sizes too big for him. Such an awkward pairing would result in discouragement, a sense of failure and likely a few painful falls.



Students in swimming lessons are not all expected to start off in the deep end of the pool. Basic swimming skills must be mastered before the student can progress to the next level. This is necessary for the safety of the student. Adaptive strategies include skill development taught in shallow water, kick boards, floatation devices and diving techniques taught from kneeling and pool side positions. Other sports involving equipment provide different sizes of balls, bats, racquets, clubs, fields, skis, etc. as well as adjustable net heights for volleyball and lowered hoops for young basketball players. Well matched equipment and instruction helps a young athlete experience gains in skill and self-confidence.

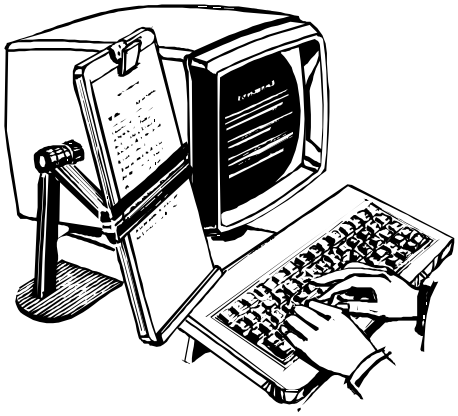
This individualized approach to sport and recreation encourages participants to learn at their own pace with equipment that fits their physical and developmental characteristics. The net result is that the learner is more inclined to enjoy the activity than he would if there was a "one size fits all" learning environment. It is worth keeping these athletic examples in mind when we examine how instruction is delivered in classroom settings.

As students progress through school, they are expected to cope with instructional materials that become increasingly text-focused in the upper grades. While most students are able to handle the task of learning from textbooks, others with reading difficulties, visual and attention deficits can feel overwhelmed. Students who have learning difficulties may find that school becomes a place that is unable to offer them a comfortable learning environment. It becomes an act of courage for students with these learning challenges to continue to come to school every day.

We know that physical differences among students can lead to performance strengths and weaknesses in an athletic environment. Similarly, cognitive differences in a classroom setting mean that students perform at higher levels when the tasks fit their cognitive talents.

Assistive technology allows a student to circumvent his area of weakness. AT becomes increasingly important where the student's disability has not improved with remedial efforts. For example, a student in a junior high school social studies class will have a hard time doing grade level work if his reading rate is well below average. Under these circumstances the student requires AT to deal with the reading requirements for this course and others. AT options may include: a parent or student reading assistant, audio tapes, chapter summaries, a hand held reading pen such as the ***Quicktionary II***, teacher-led reading, group strategies such as *collaborative strategic reading*, computer screen reading software to be used with a scanner and optical character recognition software or textbooks on disk.

In our athletic examples, the purpose of assistive or customized equipment is to promote participation, enjoyment and encourage independence. Assistive technology in the classroom should also be selected with these goals in mind.



There are a number of assistive technology product categories. These include:

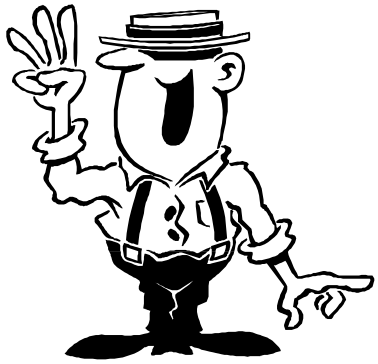
- Activities of Daily Living
- Communication
- Computer
- Environmental Access
- Health and Medical Maintenance

- Literacy / Language
- Math / Science
- Movement
- Personal Organization
- Recreation / Leisure / Play
- Safety
- Social Sciences
- Switches
- Telecommunication
- Transportation
- Wayfinding / Orientation
- Work / Vocational

The following website provides a means of searching for specific products that fit each of these assistive technology categories:

www.assistivetech.net/search/product_type_search.cfm

This site has been developed by Georgia Tech's Center for Rehabilitation Technology and its partners and is funded by the U.S. Department of Education's National Institute on Disability and Rehabilitation Research.

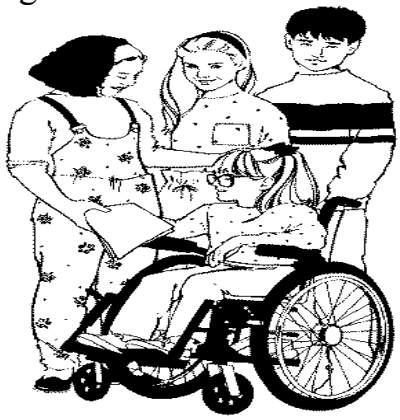


Chapter III

Developmental and Disability Issues

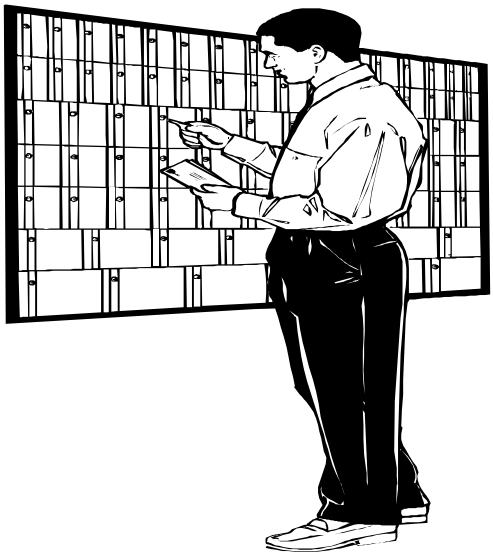
As our education system becomes more inclusive, it becomes increasingly difficult to meet the needs of all learners. Teachers and administrators have the daunting task of providing appropriate education for their diverse student populations. Whether schools are successfully meeting the needs of all students depends on one's perspective.

Teachers are human and have performance limits no matter how capable they are. It is easier for a teacher to meet student needs in a homogeneous classroom than it is with heterogeneous groupings. For this latter group, a variety of teaching strategies and materials must be implemented in order to engage all students. Some teachers have the capacity to provide this environment as long as they have experience with the curriculum, adequate time, resources and funding.



Not all teachers have the capacity to work effectively with students who demonstrate a wide range of abilities. Even teachers who feel well equipped to handle inclusive classrooms find these assignments exhausting over the long term. Some excellent teachers feel that they are penalized for their

teaching abilities as challenging students are routinely placed into their classes, while their less flexible colleagues escape these assignments.



Students and parents make class scheduling requests that administrators and counselors try to accommodate. These requests frequently express a preference for a particular instructor. If it weren't for collective agreements that limit class sizes, some teachers would find themselves with bulging enrollments while others would see their classrooms more sparsely populated. Teacher and employer negotiated class size limits may prevent students and parents from believing that their educational needs are being met if they cannot get their instructional choices. Nevertheless, class size limits provide management guidelines that help to equalize teacher workloads.

A classroom is more challenging for a teacher if there is a greater number of students who are unable to do grade level work on their own. In a high needs classroom, the teacher divides his time as evenly as he can and frequently provides tutorial sessions during non-instructional hours.

Some of these students may receive learning assistance or support at home, which can make a real difference. Other students may resist special education services, especially at the high school level, because of the stigma associated with it..

Students often feel that by asking for help, they are admitting that they are struggling. Many students are unwilling to publicly declare their need for help. As students progress through school, they want to work independently and rely on their teachers as little as possible. It is best for their self-esteem if they are given the tools and strategies that will allow them to be as self-sufficient as possible. Assistive technology that is accessible, non-stigmatizing and enabling will take some of the pressure off these students and their teachers.

Technology intervention is seen as a positive and necessary choice in many life situations. Technology is playing a life-saving role at the earliest stages of life during prenatal care and birth itself. We have vastly improved the medical outcomes for mothers and infants through the use of perinatal technology. Indeed, low birth weight babies and other high risk cases are now routinely handled with excellent results.

We have more "miracle babies" in our classrooms than ever before. These high risk survivors are statistically more likely to have to contend with developmental and disability concerns. Governments and educators should be expanding their AT initiatives to address the unique learning needs of these students. After all, if technology was viewed as medically necessary for a high risk baby to cope with the ordeal of coming into this world, it can

certainly be argued that assistive technology is educationally necessary for a disabled student to reach his potential at school.

Educators have their work cut out for them in keeping track of the latest technology to help their students with learning differences. The following Internet directory may assist teachers who feel they need current information to better understand their students' differences and AT needs.

Assistive Technology Internet Resources:

www.dyslexic.com	This UK site provides information and technology for the dyslexic population.
www.schwablearning.org	An organization in San Mateo, California dedicated to providing information to parents, educators and health professionals about learning differences.
www.newhorizons.org	An organization in Seattle, Washington that promotes inclusive learning practices in schools.

db.education-world.com/perl/browse?cat_id=6400
A data base of over 190 assistive technology website links.

www.ldonline.org
An outstanding interactive website devoted to providing information and support for the learning disabled.

www-prod.pen.k12.va.us/Div/Stafford/TLT/0907/at.html
Links to special education and assistive technology websites.

www.nimh.nih.gov/publicat/learndis.htm
National Institute of Mental Health online publication about learning disabilities.

www.techact.uconn.edu/guide.html
Connecticut Tech Act Project
Online Assistive Technology Manual

www.4teachers.org/profd/assisttech.shtml
Links to many resource sites on assistive technology.

www.makoa.org/computers.htm
Excellent page of links for adapted computer products.

www.abilityhub.com/index.htm Computer access solutions for the disabled.

www.educ.msstate.edu/PAACS/products/atg_guide.html
Online AT guide for college students with disabilities.

www.ATAccess.org
Organization focused on connecting adults and children with disabilities to technology.

www.closingthegap.com	Provides information on computer technology in special education and rehabilitation.
www.wid.org	WID is a nonprofit, international public-policy center dedicated to carrying out cutting edge research on disability issues and overcoming obstacles to independent living.
www.ldresources.com	This site provides a good variety of information including technology resources for the learning disabled.
www.abledata.com	A database of over 18,000 assistive technology products and over 2000 companies.
ericec.org	ERIC (Educational Resources and Information Center) Clearing House on Disabilities and Gifted Education. Council for Exceptional Children.