

Learning Disabilities and Assistive Technologies

Have you ever met an individual that was having a difficult time in school no matter how much they tried, studied or spent additional time doing their assignments? Well, I'm sure that we have all experienced this to some degree. There's a possibility that these individuals may have a learning disability. LD online (2007) defines learning disability as "A neurological disorder. In simple terms, a learning disability results from a difference in the way a person's brain is "wired." Children with learning disabilities are as smart as or even smarter than their peers. Although, they may have difficulty reading, writing, spelling, reasoning, recalling and/or organizing information if left to figure things out by themselves or if taught in conventional ways." There are risk factors that may cause learning disabilities such as heredity, poor nutrition, severe head injuries, chronic medical illnesses, central nervous system infections, treatment for cancer or leukemia, stress before or after birth, low birth weight, prematurity, birth trauma or distress, but often the exact causes are not known.

Learning disabilities are common all around the world. Boyse (2007) stated that, "Educators estimate that between 5 and 10 percent of kids between ages 6 and 17 have learning disabilities. More than half of the kids receiving special education in the United States have LDs. Dyslexia is the most common LD; 80 percent of students with LDs have dyslexia". It is very important that LDs are detected in children at an early age. If not, it can become quite frustrating for the child that is behind and is having difficulties in school. This can cause them to establish a low self esteem, negative behaviors and other problems in life. Unfortunately, learning disabilities can not be corrected or "cured", it is something that will be with the individual for life. Some people tend to feel that these individuals will never succeed in life because of their disability. This is definitely not true! If they receive the right assistance and interventions, these individuals will succeed in school and having promising careers.

The question that some of you may have is, How do you know whether a child has a learning disability? In some cases it is quite evident, but there are times when it is difficult to notice if a child has a learning disability or not. Some students are good at hiding it. Boyse (2007) has shared some of the observable behaviors that are found in students with learning disabilities. They are outlined on the Learning Disabilities page of the University of Michigan Health Systems website as:

- Spoken language—problems in listening and speaking
- Reading—difficulties decoding or recognizing words or understanding them
- Written language—problems with writing, spelling, organizing ideas
- Math—trouble doing arithmetic or understanding basic concepts
- Reasoning—problems organizing and putting together thoughts
- Memory—problems remembering facts and instructions
- Social behavior—difficulties with social judgment, tolerating frustration and making friends
- Physical coordination—problems with handwriting, manipulating small objects, running and jumping
- Organization—trouble with managing time and belongings, carrying out a plan
- Metacognition (thinking about thinking)—problems with knowing, using and monitoring the use of thinking and learning strategies, and learning from mistakes.

Often people with attention deficit disorder or attention deficit hyperactive disorder (ADD/ADHD) may be identified also having learning disabilities and often the strategies for providing assistive technologies overlap. (DO-IT, 2001) Early diagnosis and treatment is important for learning disabilities so a student does not fall behind in their education and basic literacy skills which often leads to frustration and self-esteem problems that in turn may result in behavior and social issues for the student. As part of an individualized

educational plan, the team of educators and parents should consider assistive technologies that would assist the student in their learning. A good definition of assistive technology is provided by Blackhurst (2005):

Assistive Technology (AT) employs various types of services and devices designed to help people with disabilities function within their environment. AT includes mechanical, electronic, and microprocessor-based equipment, non-mechanical and non-electronic aids, specialized instructional materials, services, and strategies that people with disabilities can use to (a) assist them in learning, (b) make the environment more accessible, (c) enable them to compete in the workplace, (d) enhance their independence, or (e) otherwise improve their quality of life.

A student's learning strengths and weaknesses should be carefully reviewed in choosing assistive technologies. Assistive technology has two purposes: to build on individual strengths, and to compensate for their disabilities to enable them to better perform a given task. (Forgrave, 2002) The Learning Disabilities and Assistive Technology website (www.gatfl.org) offers a Screening and Initial Solution Toolkit form that may assist a team in identifying strengths and difficulties in different academic areas. (2007)

The types of assistive technologies that may be useful for students with learning disabilities vary widely and are becoming more available and usable by a broader audience as technology improves. Assistive technology includes a "wide variety of devices that range from low-tech pencil grips (25 cents) to high-tech augmentative communication systems (\$2,500) as well as services provided by assistive technologists, occupational therapists, speech therapists, and physical therapists." (Poel, 2007) Word processors, modified monitor displays, keyboards and alternative keyboards, spelling aids, grammar checking software, online text reading programs, concept mapping, word prediction software, speech recognition programs, personal organizing tools and software, tape recorders, portable digital audio players, talking calculators are some of the technologies readily available for students today. (DO-IT, 2001) Use of software programs that assist the student in reading improves reading comprehension considerably by reducing the frustration of inaccurate

decoding. Organization software such as the concept mapping software Inspiration helps students organize and plan their writing ideas and this can significantly improve the quality of writing for students with learning disabilities. Speech-to-text software allows students with handwriting or keyboarding difficulties to record their ideas and produce better written materials. This type of software program also provides students "whose oral communication skills are far superior to their writing abilities" an opportunity to effectively communicate. (Forgrave, 2002)

Teachers should work to integrate assistive technologies for students into well-designed and meaningful activities to promote learning. (King-Sears, 2007) An example of this is outlined in the Recording for the Blind and Dyslexic's use of its Learning Through Listening program which uses audio textbooks. Reading skills are significantly improved including comprehension, decoding and fluency and the program is easily implemented into existing lesson plans. (Starkman, 2007) In an article on adapting WebQuests for students with learning disabilities, the strategies proposed may apply to modifying any online research activity. "These strategies include reducing the reading difficulty level and providing study guides, concept maps, advance organizers, and graphic organizers." These modified materials can either be provided as a supplement or handout or can be integrated into the development of the online access materials. For example, a teacher may provide a page of web links for students to access certain pre-determined websites and these supplemental materials may be provided as links on this page. (Skylar, 2007)

Programs, websites and tools that can assist students in organization skills can teach students independent skills that often do not require additional teacher intervention. (Edyburn, 2005) A sense of independence and learning life-long skills are a big part of providing students with assistive technologies. As noted on the Schwab Learning website, students with LD "often experience greater success when they are allowed to use their abilities (strengths) to work around their disabilities (challenges) and assistive technologies

can play a major role in this process.” (Raskind, 2006) A program where students were encouraged to listen to iPod devices with lesson materials resulted in students wanting to attend classes because they felt engaged and they weren’t struggling to keep up as much. (Millard, 2007)

Evaluation of an assistive technology use involves observing the student’s interest in and comfort level using the technology, how easy the technology is to learn to use, the degree to which the technology utilizes the student’s strengths, the extent to which the student can use the technology independently and solve use issues and the effectiveness of the technology in compensating for specific difficulties. (Raskind, 2006) Assessment data of student performance should be collected before and after implementation of assistive technologies so it can clearly be determined whether the use of assistive technology enhances the student’s performance and whether the assistive technology is “needed over time to support continued educational progress.” (Parette, 2007) Other factors affecting use of assistive technologies are what variety of settings the student is likely to require the use of the technology, the social appropriateness of the tool in a variety of settings and the use of the technology over a timeframe. It is critical to re-evaluate the match of the technology to the student on a regular basis to ensure the technology continues to provide the desired benefits. (Raskind, 2006)

Through Joanne’s investigation on learning disability, she learned different ways to accommodate those students in order to meet their specific needs. The first thing that she would do is look at the student’s IEP to find out what exactly is the child having difficulties in. Joanne would use the IEP to guide her in providing the appropriate tools and modifications needed for the student in the classroom and, if applicable, at home while completing his/her assignments/tasks. Since there are so many different types of learning disabilities, she finds it very important to know which one/ones a student has, simply because they are all treated differently. For example if she had a student that was having

difficulties decoding or recognizing and understanding words Joanne would take the approach that would assist them in those areas. Some of the strategies and accommodations that she may use with this particular student will help him/her complete their task easily without feeling frustrated or inferior to any other student. She would provide instructions as well as activities on audio tape when he/she is working independently. Other instructions will be given orally in the classroom. Assignments that require the student to read will be reduced to a lower amount that will prevent student from becoming frustrated or discouraged. Students will be given extended time during class work and assessments. The type of AT equipment that Joanne would utilize with her student would be books on tape, and computers that have the capability of reading text aloud. She would also use the software Kurzweil 3000 that also reads text aloud, but in addition, it assists students in the writing process. This software has a dictionary, thesaurus and a word prediction included. Teachers are able to scan text and have the computer read it to the student. If the student does not comprehend a word they can click on dictionary and it will provide the definition of the word. I find this "AT" to be very useful in the classroom for students that have difficulties in decoding, comprehending and writing. There are so many different AT out there, however, it is imperative that the teachers evaluate which ones will truly benefit the needs of their students.

For Kathy to watch the video on how Christopher Lee had such pronounced literacy abilities that he cannot spell many words beyond his address, but with clear identification of his strengths and difficulties, he has managed to use assistive technologies to accomplish a great deal in his life and career including earning a doctorate degree, really impacted her resolve to encourage our schools to implement using assistive technologies wherever identified. Articles such as *Edutopia's Assistive Technology Enhances Learning for All* show the many ways and variety of locations where assistive technologies are expanding into all kinds of learning environments. (Wahl, 2003) Several of the schools Kathy has worked with

have utilized the AlphaSmart word processor/keyboard for all students in a class to ensure that the few students identified as needing it as an assistive technology would not feel identified as receiving special treatment and all students benefited.

Kathy finds that there are a wide variety of resources available today from the basic information provided by the University of Buffalo's Assistive Technology Training Online Project to the comprehensive resources listed on the Technology Resources page of the LD Online website (<http://www.ldonline.org/resources%20new/c679/>) that can provide information to the members of an IEP team so they can make reasonable recommendations based on each student's strengths and difficulties. Kathy thinks that carefully working with the teachers, speech and language therapists, physical therapists, occupational therapists special education specialists, school administrators, and parents to review each student's academic, behavioral and social performance and collect assessments in different ways is very important to identifying not only where the student requires assistive technology but what method of delivering it would likely be most successful. She feels that unless you look at the student's strengths and difficulties carefully, recommendations could be made that may not succeed because the student may not be engaged with their use, they may have difficulty learning to use it or have problems using it in the required venues that eventually makes the assistive technology implementation less than optimal. Teacher and staff support for use of the technology is important and additional professional development may be required for them and working closely with the technical support staff in the school is paramount to ensure success. Some basic accommodations Kathy would make to her classroom for students with learning disabilities are to offer additional resources to assist them with online research, offer organizational tools such as online websites and posting homework assignments and additional resources online, and ensure that students know how to utilize the resources that are available to them on the computers, word processors, and use of graphical concept mapping software like Kidspiration and Inspiration, in addition to

any modifications that are specifically identified in their IEPs.

We now know there are many free or inexpensive modifications that can be made available to many students that could benefit whether the modifications are low-tech or high-tech but the most important aspect is to ensure the right match for the student in the required settings – this is not a “one size fits all” situation, although making more of these assistive technologies available to all students may benefit more than just certain students identified to have learning disabilities.

References

- A Chance to Read: Access Granted online video (n.d.)
<http://origin.eastbaymedia.com/%7Eweta/asx/achancetoread/access%20granted.wmv>
Retrieved November 2, 2007 from <http://www.ldonline.org/indepth/technology>
- Assistive Technology Training Online Project (2005) Students with Learning Disabilities – AT Basics. Retrieved October 29, 2007 from
<http://atto.buffalo.edu/registered/ATBasics/Populations/LD/index.php>
- Blackhurst, A. (2005, Spring) Perspectives on Applications of Technology in the Field of Learning Disabilities. *Learning Disability Quarterly*. 28(2), 175-178. Retrieved October 29, 2007 from Wilson Web database.
- Boyse, K. (2007) University of Michigan Health System. Learning Disabilities. Retrieved May 2007 from <http://www.med.umich.edu/1libr/yourchild/ld.htm>
- Community College Week staff (2003) Kurzweil changes lives of visually challenged. Community College Week 16 (5) 18(1) Retrieved September 1, 2006 from Academic Search Premier.
<http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=11118936&site=ehost-live>
- DO-IT Disabilities, Opportunities, Internetworking and Technology (June 2001) Working together: people with learning disabilities and computer technology. *The Exceptional Parent*. 31(6), 36-39. Retrieved October 29, 2007 from Wilson Web database.
- Forgrave, K. (2002, January) Assistive technology: Empowering students with learning disabilities. *The Clearing House* 75(3), 122-7. Retrieved October 29, 2007 from Expanded Academic ASAP database.

King-Sears, M. & Evmenova, A. (2007) Premises, Principles, and Processes for Integrating TECHNOLOGY Into Instruction. *Teaching Exceptional Children*, 40(1), 6-14. Retrieved October 24, 2007 from Academic Search Premiere EBSCO database.

Learning Disabilities and Assistive Technology. (2007) Retrieved October 29, 2007 from <http://www.gatfl.org/ldguide/at.htm>

LD online. (2007) LD In Depth. <http://www.ldonline.org/indepth>

Millard, E. (2007) Learning with Personal Media Players. *District Administration*, 43(5), 61-64. Retrieved October 24, 2007 from Academic Search Premiere EBSCO database.

Poel, E. W. (2007). Educational Leadership, 64-66. Abstract

Raskind, M., (2007) *E-ssential Guide: A Parent's Guide to Assistive Technology*. Retrieved October 29, 2007 from http://www.schwablearning.org/pdfs/e_guide_at.pdf?date=3-13-06&status=new.

Skylar, A., Higgins, K. & Boone, R. (2007). Strategies for Adapting WebQuests for Students With Learning Disabilities. *Intervention in School & Clinic*, 43(1), 20-28. Retrieved October 24, 2007 from Academic Search Premiere EBSCO database.

Starkman, N. (2007, January). Making the Impossible. *T H E Journal*, 34(1), 27-32. Retrieved October 24, 2007 from Academic Search Premier EBSCO database.

Wahl, L. (2003) *Assistive Technology Enhances Learning for all*. Retrieved October 29, 2007 from <http://www.edutopia.org/assistive-technology-enhances-learning-all>.