Assistive Technology: Recommendations

By: Troy Cline

Date: April 10, 1999

Introduction:

The following paper is the result of an ecological assessment conducted to determine the functional needs of a student, Sarah Johnson (*Her name has been changed*). Sarah is 16 years old, in the 10th grade and was diagnosed as having specific Learning Disabilities (*described below*) and Attention Deficit Disorder (ADD). This assessment involved gleaning information from current records and observations as well as from progress reports kept on file over the past four years. All records and observations in this assessment were completed through the combined effort and participation of the student, her parents, educational staff members and various LD specialists.

Specific Student Background Information:

Academically, Sarah has always struggled with school. She has few positive memories of elementary school. She remembers the work as difficult and struggling with peers. She received LD testing in third grade and resource services began. In grades 6 through 10 she was placed in some self-contained classes. This year she began in *mainstreaming* but needed more support and was moved into four self-contained classes. Her specific learning disability is a discrepancy between ability and achievement in basic reading skills and written expression. Other weaknesses include reading comprehension and comprehension of information given orally. She is presently taking medication for depression and ADD.

Functional Needs and Assistive Technology Recommendations:

The following section is broken down into distinct segments. Each segment specifies one of Sarah's functional needs followed by specific *Assistive Technology* recommendations. As stated in our class syllabus, these recommendations include "both low and high assistive technology tools, techniques and strategies that could be reasonably and successfully applied". Also included are specific comments/observations made by various teachers, counselors and other staff members specifically associated with Sarah's case.

1. Functional Need: Writing

Her writing demonstrates awkward sentence structure, spelling or word usage errors (involving words that sound alike or are similar) and poor organization of her ideas in multi-paragraph compositions. Several of her teachers noted that she has difficulty organizing and sequencing ideas, finding the right word to express herself, transitioning ideas and proofing for spelling and/or grammatical errors.

Recommendations:

A. Word Processing Software Packages: Using a program package such as *Microsoft Word 97* would allow Sarah to make use of features such as spell check, grammar check, dictionaries, thesaurus's and proofreading for all or her *writing* assignments. This would allow her to work more independently, concentrate more on written meaning and possibly increase her level of *academic* confidence. "Most of these programs can be used to either mark probable errors, or mark the error along with a commentary (e.g., "Be sure you are using 'is' with a singular subject."). Many programs include on-line tutorials that allow the user to study the language rules checked by the program" (See Site: Assistive Technology for Postsecondary Students)

B. Dialogue Journals: This strategy would allow Sarah's teacher to maintain an open computer dialogue with Sarah. Each day, via a computer word processing program, Sarah could make journal entries and/or write messages to her teacher. The teacher, in turn, would respond on the computer but would not make corrections to any of Sarah's entries. In this way Sarah would feel free to simply 'write for meaning' ; making any corrections with the computer. The teacher's response/writing would provide a great format by which to model correct writing techniques. Each response could contain examples of correct or improved writing techniques directly related to Sarah's entries. (See site: From Illegible to Understandable)

C. Inspiration: This particular piece of software could be the perfect solution to Sarah's organizational problems in writing. Inspiration would provide her with a method of visually organizing her thoughts and ideas: a visual map. The program actually has a visual diagramming part that would allow her to arrange and rearrange her ideas in order to clarify thinking before developing a written document. It also allows the user to instantly switch to any one of several types of diagramming schemes: concept maps, idea maps, webbing maps and storyboards. Without a doubt this program could help Sarah immensely in areas of planning and organizing notes. It would also assists Sarah in learning how to create structure for written reports and stories. (See Site: Inspiration)

2. Functional Need: Basic Reading Skills and Comprehension

The most recent testing indicates that Sarah's word recognition and decoding skills are weak. She has difficulty using phonetic and structural analysis to decode unfamiliar words. She relies on using sentence context to decode unknown words. This is a time consuming task for her and she may therefore require extra time to complete reading assignments.

Recommendations:

A. ULTimate Reader: This word recognition program will enable a computer to read any text "with flexible voice and highlighting combinations. Any text can be scanned in or moved from a word processing file, CD-ROM, the Internet, or any online service" (See Site: ULTimate Reader). Students who have low reading competencies and ADD, such a Sarah, could greatly benefit from this type of technology. With this program she could simply highlight words that she cannot pronounce as well as hear entire sentences spoken in context. Given a pair of headphones, Sarah could independently listen to any text while visually following along.

B. Proportional Reading Program: This program enables the user to increase both reading speed and comprehension and is ideal for students with learning disabilities and ADD. With this program "any text can be instantly read out loud in real human voice fluently as it is displayed on the screen one word or one sentence at a time" (See Site: Proportional Reading). One feature allows the user to pause, continue, stop or repeat text at any point thus meeting the needs of many different learning styles. Furthermore, the user can adjust how quickly text is displayed and/or read aloud.

3. Functional Need: Information Processing

She presents information-processing deficits in visual motor integration, auditory memory and auditory processing. Several teacher's noted that because she has difficulty processing, she seems able to follow directions more easily if they are presented in both written and spoken form. Additional observations indicated that she sometimes becomes lost or confused if oral explanations and clarifications are not brief. Due to a combination of these functional needs, Sarah also has a difficult time with skills that involve note taking, classroom organization and studying for exams.

Recommendations:

A. Pressure-sensitive Paper: This is carbonless paper that "allows the user to tear off copies of classroom lecture notes to share with a fellow student whose note-taking abilities may be weak"(see site: Assistive Technology). I would only recommend that this strategy be used as a method to allow Sarah to compare her notes to another students notes; not as a sole method of note taking. This strategy would allow Sarah to view other successful note taking skills that could inevitably increase her note-taking skills as well.

B. Variable speech control tape-recorder (VSC): This devise would allow Sarah to record various directions/lectures during class and play them back a slower or faster rate without the loss of intelligibility/voice quality. Increasing the playback rate would allow her to review lecture note and strengthen her listening skills. Slower playback would allow her to re-listen to lectures that are more complicated and/or directions as well as assist in the clarification of newer concepts.

C. Voice Organizer: This is an amazing hand-held device that allows the user to simple speak in, not type in, various schedules, dates and reminders. When necessary, it can also be programmed to alert the user with a beep. Once alerted the user hears the reminder spoken back in his or her *own* voice! Sarah could use this device to assist her with remembering various directions, assignments and special dates. One user, who was diagnosed as ADHD stated," I use it as a list for what I have to accomplish for the day, and this helps to keep me less anxious about forgetting anything I have to do. It will help me to remember when I have to take medication. I think of it as a life organizer"(See site: Voice Organizer)

D. Computer Projection Device: Sarah's teacher could make use of a computer projection device such as The Proxima Light Book. With some training her teacher could learn to make more colorful and attention grabbing classroom presentations. This type of technology could greatly assist Sarah in helping her to maintain focus and attention during class. According to one article, Students Assess Computer-Aided Classroom Presentations, students reported that these types of presentations not only made the class more organized but made the information clearer and neater. They also reported positive gains in note taking due to the fact that the projector:

- highlighted the important information and key points
- solved the problems associated with students trying to read the teacher's hand-written notes
- helped students see words that were hard to pronounce or spell

4. Functional Need: Anxiety Level

Although Sarah works persistently, she shows a lack of confidence in her academic abilities and exhibits high anxiety levels in reference to her performance. It has also been noted that increased noise levels, being in larger classes and feeling lost or confused during classroom lessons can dramatically effect her level of concentration and anxiety. One teacher mentioned that during those instances where she seems to have difficulty understanding verbal concepts, she quickly becomes very discouraged and afraid of failure.

Recommendations:

A. Personal FM listening Systems: This device could help Sarah to maintain focus and concentration on the speaker/teacher during lectures and/or when receiving verbal directions. It is a *FM listening system* consisting of "a wireless transmitter with a microphone and a receiver with a headset or earphone. For situations in which there is only one speaker (e.g., a professor in a classroom), the speaker "wears" the transmitter unit while the user wears the receiver unit. The transmitter or receiver is easily clipped to

a belt or shirt pocket. The microphone is only about 1 1/2" long and is easily clipped to clothing e.g., tie)" (See Site: Assistive Technology for Postsecondary Students). It would definitely come in handy when Sarah is in a classroom consisting of a larger student population.

B. Small Group Activities: Some of Sarah's teachers noted that she could greatly benefit from small group assistance: small group activities and/or cooperative learning projects. All of these activities could be easily facilitated through use of a computer. For instance, Sarah could be grouped with one or two other students and given an assignment to create an article for a school or classroom newspaper. An activity such as this would allow Sarah to not only gain more writing skills from her peers but would also provide a highly motivational activity that could turn her anxiety into motivation. Her peers would also be valuable in that they would inadvertently reinforce various directions, guidelines and concepts.

Web Sites Used:

1. Assistive Technology: Meeting the Needs of Adults with Learning Disabilities **:** This site offers several incredible ideas and strategies that can be easily incorporated by those working with LD students.

2. Inspiration:
"INSPIRATION is a visual learning tool that inspires students to develop and organize their ideas. It supports visual techniques, enabling students to easily create and update graphic organizers, concept maps, idea maps and other visual diagrams."

3. LD Online:
This site explores "new developments in technology, and practical insights into the promise and realities of making technology work for people with learning disabilities".

> **A.** Assistive Technology for Postsecondary Students with Learning Disabilities: An Overview, by Marshall H. Raskind, Eleanor L. Higgins
> "Although this paper focuses on technology for postsecondary students with learning disabilities, many of these technologies can be used successfully by children as well."
>
> **B.** From Illegible to Understandable: How Word Prediction and Speech Synthesis Can Help, by Charles A. MacArthur
>
> **C.** Voice Organizer:
> This site will further explain the uses, features and benefits of the Voice Organizer.

4. Proportional Reading
"Proportional Reading software is based on the observation that many reading difficulties occur because of very small processing difficulties which can be easily compensated by use of a computer. Proportional Reading uses the computer to provide instant functional compensation for at least 20 major reading difficulties".
5. The Proxima Lightbook (NOTE: This link will take you to a Web site that I created as a project for one of my Educational Technology classes. It explains the various details and setup instructions associated with the Lightbook. I hope you enjoy it!)

> A. Students Assess Computer-Aided Classroom Presentations, by Dr. Martha C. Sammons,
> "This paper describes the results of a pilot program conducted in the College of Liberal Arts at Wright State University during the1993/4 school year in which students judged their instructors. The overall purpose of this project was to motivate faculty to improve teaching and learning through use of technology-based classroom presentation tools."

6. ULTimate Reader by Universal Learning Technology
"ULTimate Reader adds spoken voice and visual highlighting to any electronic text. Users can scan text in, down-load it from the internet or any other on-line service, move it from a word-processing or other text file or from a CD ROM. Teachers and students use ULTimate Reader to speak and/or highlight material including textbooks, tests, worksheets, notes, reference material and classic literature."