

## ICTS FOR POSTSECONDARY STUDENTS WITH LEARNING DISABILITIES: STUDENTS VS EXPERTS

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### ABSTRACT

Findings on the use of information and communication technologies (ICTs) by 77 junior/community college students with learning disabilities (LD) and 58 experts from Quebec are presented. In addition, brief descriptions of ICTs recommended by the experts and/or used by students are provided and the recently updated free or inexpensive ICTs section of the Adaptech Research Network's "Downloads" section is described. The goal is to provide information about ICTs that can help students succeed.

### SUMMARY

Learning disabilities (LD) are the most common disabilities among college and university students in the United States, England, and Canada. A variety of general use and specialized information and communication technologies (ICTs) are available to help enhance the academic success and satisfaction of these students. Nevertheless, students with a variety of disabilities, including LD, do not use needed specialized technologies. This is due to a variety of reasons, including: they are not aware the technologies exist, they do not know where to acquire them, they are not able to pay for them, and/or they do not know how to use them. In addition, many students are unaware they have LD, and incorrectly believe, instead, along with their parents, teachers, and counsellors, that they are lazy, stupid and/or unmotivated. So it simply does not occur to them that computer technologies could help.

Nevertheless, there are ICTs available that can help students with a variety of learning disabilities. But a comprehensive list of ICTs that can help those students does not exist. Because we live and work in Quebec, with approximately 5 million French speaking residents, it is important to note that some technologies are regrettably available only in English. This is because they were developed either in the USA or England. Other ICTs, although they have an English interface, can work in French as well. Many technologies are extremely expensive while others are inexpensive or free (many of these are documented on the Adaptech Research Network web site under "Downloads" - some of these are long-running demos, while others are fully functional).

Because of the growing number of students with LD in postsecondary education and because of the potential of ICTs to help them succeed, it is important to know what general use and specialized ICTs are seen by "experts" as potentially helpful and what students with LD are actually using. Therefore, the main objectives of the research presented here are: to examine the academic ICT use of postsecondary students with LD, to compare their experiences with those of experts, and to disseminate empirically based recommendations about both specialized and general use ICTs that can assist these students' success.

### METHOD

In 2009, we interviewed 58 experts who were knowledgeable about both LD and ICTs that are potentially useful for students with LD. Participants were 25 postsecondary disability service providers, 14 students, 6 community-based individuals, 5 professors, 5 vendors, and 3 ICT specialists. Thirty interviews were held in French and 28 in English.

Based on their responses, a listing of the advantages and disadvantages of ICTs for students with LD can be found in Tables 1 and 2.

**TABLE 1. ADVANTAGES OF USING ICTS FOR STUDENTS WITH LEARNING DISABILITIES**

Advantage	Percent
Supports success	76%
Independence/autonomy	38%
"Leveling the playing field"	31%
Increased confidence and motivation, decreased stress	29%

**TABLE 2. DISADVANTAGES OF USING ICTS FOR STUDENTS WITH LEARNING DISABILITIES**

Disadvantage	Percent
Expensive	34%
Technical problems	34%
Time consuming/extra effort	34%
Negative perceptions	29%
Over-reliance on technology	29%
Lack of training/information	26%
Difficulty obtaining services	12%
Reluctance to use technology	12%



These tables show that the main perceived advantage of using ICTs for students with LD is that these support academic success. ICTs were also seen as helping students work more independently, without having to rely on others to help them complete their academic work. ICTs were also perceived as “leveling the playing field” by allowing students with LD to work at their own pace, function on par with their peers, and achieve grades which more accurately reflect what they have learned. In addition, ICTs were viewed as increasing students’ self-confidence and motivation, and decreasing their stress levels.

As for disadvantages, the experts noted first and foremost that ICTs cost too much. Other common topics were technical problems and the attendant frustration when specific ICTs do not work well or are not compatible with other ICTs. In addition, the experts emphasized the need for students to put in extra effort to learn to use the software. Another perceived disadvantage relates to negative perceptions. For example, some peers and faculty view the use of ICTs as conferring an unfair advantage akin to cheating. Other negative perceptions noted include the use of ICTs as singling out students as being “different.”

Interviewees also mentioned the possibility of students becoming excessively dependent on technology and/or on the people who help them work with these. The experts also noted the general lack of information about ICTs, the few opportunities to learn how to use specialized ICTs, and highlighted the lack of access to services. Finally, participants also mentioned that, for a variety of reasons, some students are reluctant to use ICTs that could help them.

During the 2010-2011 academic year, 77 junior/community college students with LD completed an online questionnaire. Forty-seven percent were English and 53% were French speaking. Students were presented with a list of 21 ICTs, based on the experts’ recommendation, and asked to indicate, for each, whether they used this for school work.

The results indicate that most students with LD use PC based software although close to a third use Macs. Comparison of the experts’ recommendations and what the students actually use (see Table 3) shows important gaps between the views of the experts and the realities of the students, who, it seems, do not use many of the ICTs that could benefit them.

**TABLE 3. ICTS USED BY THE STUDENTS AND RECOMMENDED BY THE EXPERTS IN ALPHABETICAL ORDER**

ICT	Used by Students (n=77)	Recommended by Experts (n=58)
Use a PC	84%	N/A
Use a Macintosh	28%	N/A
Antidote (French language grammar and spelling software) More info <a href="http://www.druide.com">www.druide.com</a>	61%	47%
C-Pen (portable scanner with optical character recognition) Scanned text can be transferred to Microsoft Word. More info at <a href="http://www.adaptech.org/en/downloads/fandi/product/249">http://www.adaptech.org/en/downloads/fandi/product/249</a>	N/A	9%
Cell phone/Smartphone/iPod, etc. For a description of built-in features and reading, writing and organizational software of iPhone, iPad, iPod touch go to <a href="http://www.adaptech.org/en/downloads/ifandi">http://www.adaptech.org/en/downloads/ifandi</a>	69%	10%
ClaroRead (multipurpose software) Includes text-to speech, highlighting, optical character recognition, contrast and background color selection, word prediction, etc. More info at <a href="http://www.adaptech.org/en/downloads/fandi/product/155">http://www.adaptech.org/en/downloads/fandi/product/155</a>	N/A	5%
Dictation software (you talk, it types) More info about different products <a href="http://www.adaptech.org/en/downloads/fandi/cat/40">http://www.adaptech.org/en/downloads/fandi/cat/40</a>	10%	65%
Digital course materials (class notes, course-packs, etc.)	N/A	5%
Digital recorder (record lectures, etc.)	14%	16%
E-book (digital, e-text books)	12%	0%
E-book reader (e.g., Kindle, Sony)	4%	0%
Electronic dictionary More info about different products at <a href="http://www.adaptech.org/en/downloads/fandi/cat/90">http://www.adaptech.org/en/downloads/fandi/cat/90</a>	55%	2%
Inspiration/concept mapping Software allows users to visually 'map-out' essay structures. More info at <a href="http://www.adaptech.org/en/downloads/fandi/cat/80">http://www.adaptech.org/en/downloads/fandi/cat/80</a>	9%	36%
Instant messaging - IM (e.g., MSN, Skype) Can use with a spell checker (e.g., IMSpellchecker - see <a href="http://www.interactivegt.com">http://www.interactivegt.com</a> )	69%	0%
Kurzweil 3000 (multipurpose software) Allows opening a variety of files (DOC, PDF, JPG, etc.), scanning and optical character recognition (OCR), text-to-speech, word prediction, concept mapping, etc. More info <a href="http://www.adaptech.org/en/downloads/fandi/product/201">http://www.adaptech.org/en/downloads/fandi/product/201</a>	6%	45%
Laptop	83%	36%
Médialexie (multipurpose software) Includes a word processor, spell checker, speech synthesizer, dictation, etc. More info at <a href="http://www.medialexie.com/">http://www.medialexie.com/</a>	3%	17%
MP3 to listen to books/texts Audiobooks and books read using text-to-speech. You can use TextAloud <a href="http://www.nextup.com/TextAloud/">http://www.nextup.com/TextAloud/</a> to convert files to mp3	27%	2%
Online/distance education courses	N/A	5%
Office suite (e.g., Microsoft Office, Open Office)	84%	71%
PDF (e.g., Adobe Acrobat Reader)	71%	0%
ReadPlease (simple to use free program that reads text aloud) More info at <a href="http://www.adaptech.org/en/downloads/fandi/product/65">http://www.adaptech.org/en/downloads/fandi/product/65</a> See a demo on YouTube at <a href="http://www.youtube.com/user/adaptechresearch#p/u">http://www.youtube.com/user/adaptechresearch#p/u</a>	4%	12%

ICT	Used by Students (n=77)	Recommended by Experts (n=58)
Scanning and optical character recognition Scan printed material and render it into digital e-text. See a demo of OmniPage on YouTube at <a href="http://www.youtube.com/user/adaptechresearch#p/u">http://www.youtube.com/user/adaptechresearch#p/u</a>	26%	9%
SmartPen (a pen that has a built-in microphone) When recording a lecture and taking notes at the same time with its special paper, the written notes are linked to what was recorded. More info at <a href="http://www.adaptech.org/en/downloads/fandi/product/190">http://www.adaptech.org/en/downloads/fandi/product/190</a>	3%	3%
Software that reads what is on the screen More info about miscellaneous text-to-speech/screen reading software can be seen at <a href="http://www.adaptech.org/en/downloads/fandi/cat/30">http://www.adaptech.org/en/downloads/fandi/cat/30</a>	18%	38%
Spark-Space (multipurpose software) Consists of two products: includes text-to-speech, concept mapping, dictionaries, etc. More info at <a href="http://www.adaptech.org/en/downloads/fandi/product/189">http://www.adaptech.org/en/downloads/fandi/product/189</a>	N/A	5%
SpeakQ (dictation software meant to work with WordQ) More info at <a href="http://www.gogsoftware.com/product-details/speakq/">http://www.gogsoftware.com/product-details/speakq/</a>	N/A	5%
WordQ (word prediction software) It provides a list of words to choose from as you type the first few letters of each word. Can pronounce each word. More info at <a href="http://www.adaptech.org/en/downloads/fandi/product/133">http://www.adaptech.org/en/downloads/fandi/product/133</a> Demo on YouTube at <a href="http://www.youtube.com/user/adaptechresearch#p/u">http://www.youtube.com/user/adaptechresearch#p/u</a>	23%	29%
Wynn (multipurpose software) Allows opening a file, highlighting, scanning and optical character recognition, text-to-speech, etc. More info at <a href="http://www.adaptech.org/en/downloads/fandi/product/27">http://www.adaptech.org/en/downloads/fandi/product/27</a> N/A = not asked of participants.	3%	19%

The results suggest that the most useful ICTs for students with LD are those that (1) correct grammar and spelling, (2) read what is on the screen, (3) highlight, (4) zoom, (5) provide word prediction, (6) scan and provide optical character recognition (OCR), (7) link ideas visually, (8) help students schedule and organize their activities, and (9) allow students to dictate instead of type. (10) Digital e-text, (11) portable devices, (12) digital dictionaries, and (13) audio/mp3 versions of books can also be useful. Of course, not all students with LD need all of these features.

A concern that has been repeated throughout all of our studies on aspects related to factors that influence academic success of college and university students with various disabilities has been the high cost of needed specialized information and communication technologies. In response to this, we undertook the compilation of a list of free and/or inexpensive hardware and software alternatives, including built-in Mac and Windows 7 features and iPod touch, iPhone and iPad apps. These are updated regularly and are available at <http://www.adaptech.org/en/downloads>

We recommend that postsecondary educational institutions and other organizations which support individuals with LD hold ICT tech fair days where they demonstrate various forms of ICTs. Workshops, talks, demos, videos, and hands-on experiences and individual training are also likely to be useful. As for research, more studies are needed on the performance and academic outcomes of students who use LD related ICTs. Only once the impact of these ICTs is demonstrated will postsecondary institutions and government programs display enthusiasm about supporting - and paying for - these technologies.

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