Junior / Community College Students with Learning Disabilities and Their Use of Information and Communication Technologies (ICTs)

English adaptation of the Final report for the Fonds de recherche du Québec – Société et culture (FRQSC) and the ministère de l'Éducation, du Loisir et du Sport (MELS)

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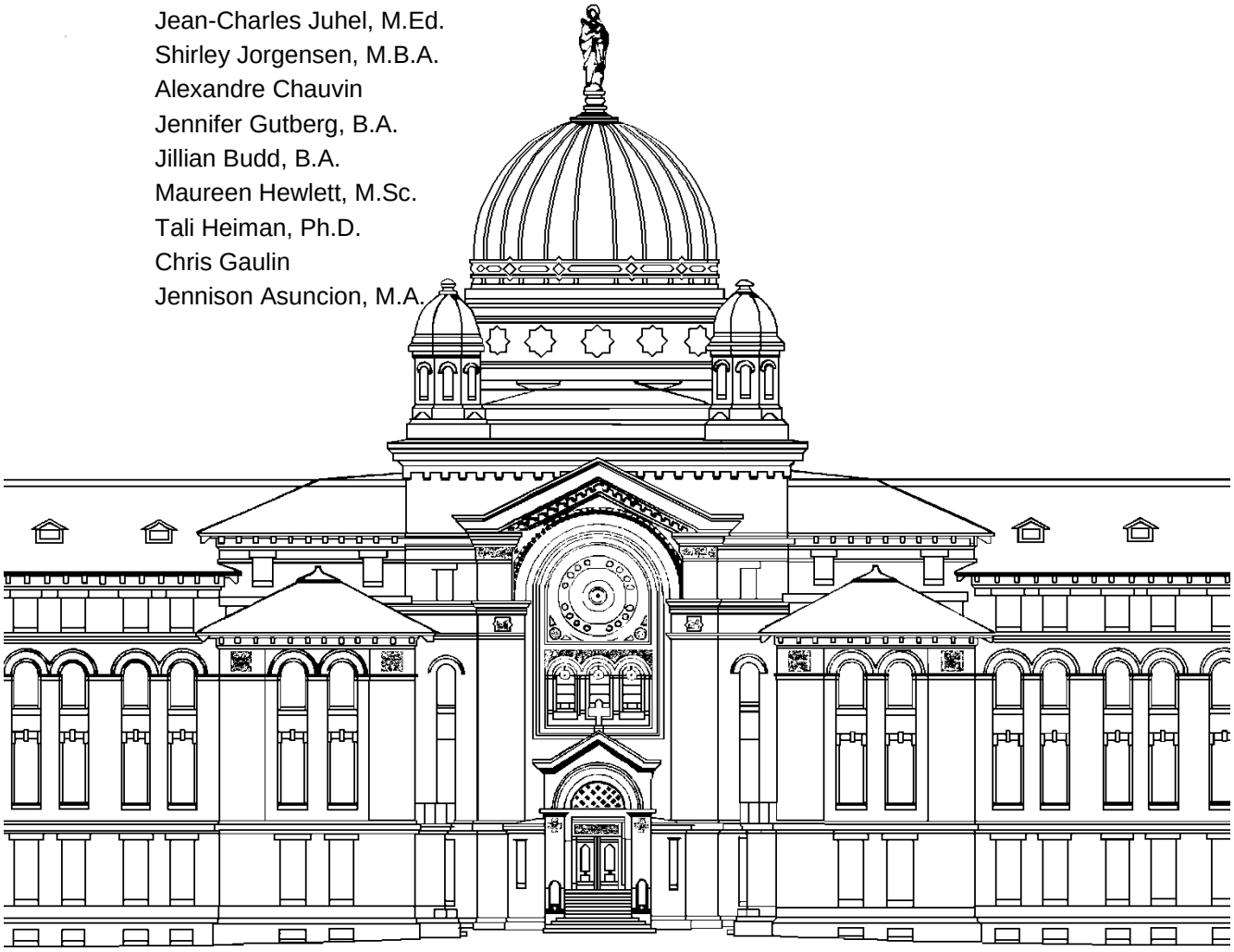
Authors
Mai Nhu Nguyen, B.Sc.
Catherine Fichten, Ph.D.
Laura King, M.A.
Maria Barile, M.S.W.
Zohra Mimouni, Ph.D.
Alice Havel, Ph.D.
Odette Raymond, M.Ed.
Jean-Charles Juhel, M.Ed.
Shirley Jorgensen, M.B.A.
Alexandre Chauvin
Jennifer Gutberg, B.A.
Jillian Budd, B.A.
Maureen Hewlett, M.Sc.
Tali Heiman, Ph.D.
Chris Gaulin
Jennison Asuncion, M.A.



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Mai Nhu Nguyen, Adaptech Research Network
Catherine Fichten, Dawson College, Jewish General Hospital, McGill University and Adaptech Research Network
Laura King, Cégep André-Laurendeau and Adaptech Research Network
Maria Barile, Adaptech Research Network
Zohra Mimouni, Collège Montmorency
Alice Havel, Dawson College and Adaptech Research Network
Odette Raymond, Cégep du Vieux Montréal and Adaptech Research Network
Jean-Charles Juhel, Cégep de Sainte-Foy
Shirley Jorgensen, Dawson College and Adaptech Research Network
Alexandre Chauvin, Adaptech Research Network
Jennifer Gutberg, Adaptech Research Network
Jillian Budd, Adaptech Research Network
Maureen Hewlett, Mount Royal University and Adaptech Research Network
Tali Heiman, The Open University of Israel
Chris Gaulin, Adaptech Research Network and WhiteFlash Consulting
Jennison Asuncion, Adaptech Research Network

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ABSTRACT

Junior / community college students who have learning disabilities (LD), such as dyslexia, often do not maximize their use of information and communication technologies (ICTs) for school work. They do not use many of these technologies nor do they know as much about them as other students. These are the results of an Adaptech Research Network study on ICTs where the key research questions were: What proportion of students in colleges self-report having an LD? What proportion of these students register for disability related services from their college? What ICTs are recommended by experts for students with LD to facilitate academic work? What ICTs do students with LD actually use, and how does this compare with ICTs used by students without LD?

Over 4% of students enrolled in one English junior / community college and two French junior / community colleges self-reported having LD; only 59% of students with LD were registered for disability related services from their college. The findings also highlight important discrepancies between experts' views and the realities of students with LD: differences in terms of ICTs that could be useful (experts' opinions), and in terms of those that are actually used by students with LD.

We recommend that students with LD be taught how to use specialized ICTs before they enter college. There needs to be adequate funding as well as opportunities for these students to learn to use potentially helpful ICTs while at college as well. Access to and use of the necessary ICTs will allow these students to develop the skills needed to succeed in academic and professional settings, as well as in the community at large, where ICTs are now ubiquitous.

SUMMARY

The number of students with learning disabilities (LD), such as dyslexia, in Quebec's (the second largest Canadian province) colleges and universities has increased dramatically. Fortunately, a variety of general use and specialized information and communication technologies (ICTs) are available to help increase these students' levels of academic satisfaction and academic success.

The Adaptech Research Network, in partnership with researchers from several junior / community colleges, recently completed a 3-year study (funded by FRQSC-MELS) which focused on the use of ICTs by students with LD at the college level. The key questions were: What proportion of students in the colleges self-report having LD? What proportion of these students register for disability related services from their college? What ICTs are recommended by experts to help students with LD? What ICTs do students with LD actually use? How does this compare to ICTs used by students without LD? Additional details about the method and the findings are available in Fichten et al. (2012, 2013, in press).

To answer these questions, we interviewed 58 experts who were knowledgeable about LD in general and about potentially useful ICTs for students with LD. To find out about students with LD in the colleges we administered an online questionnaire to 74 students with LD and 96 students without LD (53 adequate and 43 very poor readers based on the results of a reading comprehension test).

Results show that over 4% of students in the English college and the two French colleges self-reported having LD. Of these students, only 59% indicated they were registered to receive disability related services from their college.

It is important to note that major differences exist between experts' and students' responses on useful ICTs. Experts and students indicated that the following ICTs could be potentially useful for college students with LD:

- multipurpose software, both general use (e.g., Office suite) and specialized (e.g., Wynn, Kurzweil, Médialexie, ClaroRead)
- dictation (speech-to-text) software
- software that corrects grammar and spelling (e.g., Antidote, WordQ)
- electronic dictionaries
- screen reading software (text-to-speech) (e.g., ReadPlease)
- e-books
- scanning and optical character recognition (OCR) (e.g., C-Pen, OmniPage)
- mind-mapping/concept mapping software (e.g., Inspiration)
- digital recording (e.g., Smartpen)
- laptops
- digital course materials and online course notes.

Many of the experts' recommended ICTs, however, were not being used by students. More specifically, the students reported using fewer specialized ICTs and more general use ICTs than the experts mentioned. These include:

- mobile technologies (e.g., smartphones/cell phones/iPods)
- instant messaging (e.g., MSN, Skype)
- MP3s to listen to books/texts.

Results also indicated that students with LD have more difficulty using ICTs and are less knowledgeable about them than their nondisabled peers, including those who are very poor readers. Furthermore, students with LD used significantly fewer ICTs to complete their school work than their nondisabled peers.

Males and females, regardless of whether or not they had LD, did not differ in the number of ICTs that they used. Nor did students from two-year pre-university and three year career/technical programs.

In addition, there were few significant differences in software use between students with LD from French and English language colleges: Antidote and WordQ were reported as being used more extensively in the French colleges, while smartphones, cell phones, iPods, instant messaging, Kurzweil 3000, and scanning and optical character recognition (OCR) were more frequently used in the English college. Also, students with LD from the English college were more likely than those from the French colleges to have learned to use ICTs in high school or earlier. Students from French colleges were more likely to have learned to use ICTs on their own or after starting college.

We recommend that students with LD be informed about ICTs that could be helpful, including free and inexpensive software, such as those listed on the Adaptech Research Network's "Downloads" page <http://www.adaptech.org/en/downloads> to allow them to experiment with these. Students with LD should be taught how to use specialized ICTs in high school. There should be adequate opportunities and funding for them to learn how to use ICTs at school and at home. Workshops on how to use ICTs should also be offered in colleges. In addition, YouTube videos should be created to provide "palatable" training on the use of ICTs.

Given that smartphones are ubiquitous, appropriate apps for mobile devices should be explored and made available to students with LD (see the Adaptech Research Network website).

To encourage ICT use, students should be allowed to use needed ICTs to complete school work of various types (e.g., exams, assignments, labs).

Cheaper/inexpensive and more efficient diagnostic services for students who may have LD who have not yet been diagnosed are needed.

There is also a need for college staff who work with students with LD to have more time for training on ICTs and for more space in the college to be dedicated to such training (such as specialized computer laboratories).

Communication also needs to be improved: within colleges, between colleges, between high schools and colleges, between colleges and ICT resource centers as well as with tutoring and academic support centers.

Whenever possible, universal design of instruction (UDI) practices should be encouraged and promoted in the colleges. This could benefit not only students with LD, but also the large numbers of students who are very poor readers, as well as second (and third) language learners who have not yet mastered the language of instruction at their college.

RESEARCH REPORT

Part A – Context of the research

1. Background

Definition and description of LD. Recent documentation shows that learning disabilities (LD) are the most common disabilities among Quebec's junior / community college and university students (AQICESH, 2011; Lavallée, Raymond & Savard, 2011; Bonnelli, Ferland-Raymond & Campeau, 2010; Dubois & Roberge, 2008; Mimouni & King, 2007). For example, in our recent studies of Quebec college students with disabilities (Fichten, Jorgensen, Havel, Barile et al., 2006), the most common disability, reported by almost 50% of the sample of 300 students registered to receive disability related services from their school, was LD with or without Attention Deficit Hyperactivity Disorder (ADHD). Thus, learning disabilities are a genuine and significant issue within Quebec colleges.

Although definitions of LD vary, there is reasonably good agreement among experts that LD is related to academic performance characterized by poor reading, writing, and/or mathematical skills despite sound cognitive ability (Wolforth & Roberts, 2010). A specific type of LD, known as dyslexia, manifests itself as reading difficulties in terms of reading accuracy and speed, which results in comprehension difficulties (Couston, 2006). It is the most common LD among college students, including those in Quebec's French language colleges (Mimouni & King, 2007). Dyslexia often co-occurs with physical and sensory disabilities (Fichten et al., 2006), ADHD, as well as with other forms of LD, such as problems with written language (e.g., spelling and written expression), oral language (e.g., listening, speaking, understanding), and mathematics (e.g., computation, problem solving). Individuals with dyslexia may grasp only part of the meaning of what they read or none of it at all, and often avoid activities that require reading. Some students submit papers that are difficult to understand due to poor grammar and/or spelling that is unrelated to and not a result of their mother tongue, IQ or educational background.

Many high school students are unaware that they have LD and experience difficulties only when they enter college or university, where reading loads increase significantly and students are expected to do substantial amounts of writing. Although well known in English speaking academic settings, LD is sometimes under-recognized by French speaking college and university students (AQICESH, 2011), as well as by their parents and teachers.

Information and communication technologies. Research reports show that there are both specialized and general use ICTs that can help students with LD succeed (cf. Rousseau, 2010). Nevertheless, a comprehensive list of such ICTs does not exist. When one hears about ICTs for students with LD, the most popular type of software – and often the only one mentioned by French speaking students and staff - is Antidote, software which is intended for the general population. Antidote incorporates French dictionaries and grammar related writing guides. Its main goal is to improve writing rather than helping with reading problems. Given that reading problems are the most common form of LD, the benefit of Antidote is limited for a large proportion of students with LD.

The extent to which ICTs help postsecondary learners with disabilities is heavily debated in the scholarly literature. Clear answers are unavailable because of methodological and conceptual concerns.

Studies on the use of ICTs by people with LD are relatively recent and, thus, few theories have been developed on this subject. However, there are descriptive data and anecdotal evidence on the variables which influence both the use of ICTs and on those that facilitate or hinder academic success for students with LD. This research tends to be purely applied and atheoretical, reflecting the present embryonic stage in this area and the pressing need for practical solutions. The vision of the "Perseverance and Academic-Success Program" which funded our research coincides with our main objective which is to ensure rigorous results so these are recognized by the scientific community and are practical and useful within Quebec society. Despite the fact that this study is based on scientific principles and methodology and on the administration of valid tools and measures, it remains atheoretical. Therefore, we emphasize the evaluation of hypotheses as well as application of the resulting recommendations within the colleges.

2. Primary research questions

Key questions to be answered were:

- What ICTs are recommended by experts to help students with LD complete their academic work?
- What ICTs do students with LD actually use, and how does this compare with ICTs used by adequate and very poor readers who do not self-report having LD?
- What proportion of students in the colleges self-report having LD? What proportion of these students register for disability-related services from their colleges?

3. Goals

It is essential that colleges and Quebec's ministries be aware of the types of funding which are cost-efficient and worthwhile with respect to ICTs and students with LD. This ever-growing population needs both specialized and general use ICTs to succeed academically. Consequently, the present study had the following objectives: (1) examine the use and availability of ICTs which have as their goal improving the quality of academic work of students with LD in French and English colleges; (2) establish and publicize recommendations concerning the most effective manner in which ICTs should be provided at the junior / community college level.

Part B – Solutions based on the results, research outcomes and implications

1. Audiences

Our work is addressed to the ministry (MELS), administrators, managers, teachers, students with LD, and disability related service providers at colleges, as well as tutoring and special-education centers.

2. Implications of the conclusions

New policies should be put into place to promote greater sensitization and a more efficient response to the ICT needs of students in colleges. Students, as well as faculty and campus disability service providers, need better training and more opportunities to learn how to use specialized ICTs. Students with LD rarely receive training on specialized ICTs before entering college, making their first year especially difficult. Both high schools and private tutoring/remediation centers could help by teaching students how to use the necessary ICTs efficiently before they begin college.

3. Immediate or expected outcomes

This research provides recommendations concerning what should be done with regard to ICTs to help students with LD, as well as poor readers, succeed in college. In addition, many Quebec students with dyslexia and other types of LD are not formally diagnosed. Therefore, we make recommendations based on principles of universal design of instruction (UDI) (McGuire, Scott, & Shaw, 2003; Nguyen, Fichten, Barile & Lévesque, 2006; Barile, Nguyen, Havel & Fichten, 2012). These can promote access to ICTs that improve reading in the colleges for ALL students, including those with LD.

4. Limitations of the study

First, only one English and two French language colleges were sampled. Second, students self-identified as having LD. Third, we purposely excluded second language learners, whose ICT use profiles may differ from those of primarily English and French speakers. Finally, two out of three measures were administered online and completed without supervision.

5. Key findings

- Approximately 4% of students enrolled in compulsory English or French language courses reported having LD. For example, in a college of 6000 students, about 240 students are likely to self-report having LD.
- Approximately ⅓ of students self-reporting LD also self-reported having ADHD.
- Only 5% of students without LD indicated having ADHD.
- There are many poor readers in colleges who do not self-identify with LD.
- Not all students with LD have dyslexia. Many are reasonably good readers but have other forms of LD such as dysorthographia, dyscalculia or memory related issues. These students need ICTs to help them with writing and organizing their ideas.
- Students with LD need to learn to use ICTs while they are in high school.
- Many of the popular ICTs recommended by experts for students with LD are expensive.
- There are inadequate opportunities to learn how to use ICTs in colleges.
- There are extensive lists of free and inexpensive LD related ICTs on the Adaptech Research Network web site in the "Downloads" section <http://www.adaptech.org/en/downloads>.

- Experts recommend numerous ICTs for students with LD, but few of these were actually used by students.
- Students are more likely than experts to indicate using smartphones and instant messaging as productivity and organizational tools.
- E-learning (i.e., ICTs used by professors in their teaching) needs of students with LD are not as well met as those of students without LD.
- There is a need for sensitization and training throughout the college community (students, campus disability service providers, faculty and other college personnel) on the use of ICTs.
- There is a need for college personnel to have more time, more space within the college (e.g., specialized computer labs), more human resources and more funding for training in the use of ICTs.
- There is a need for better communication between stakeholders: within the colleges, between the colleges and high schools, ICT resource centers, and academic tutoring and support centers.

6. Key solutions

- Teach needed ICTs to high school students with LD.
- Arrange for cheaper and more efficient diagnosis for students who may have undiagnosed LD.
- Allow students to use needed ICTs to complete their school work.
- Provide funding for colleges to enable them to acquire the necessary ICTs for their computer labs.
- Provide funding for the ICTs that students need to use at home.
- Arrange training for both students and campus disability service providers in the colleges.
- Recommend appropriate smartphone apps for students with LD.
- Provide a comprehensive list of available free and inexpensive ICTs to students with LD so they can experiment before buying.
- Offer workshops and fairs on ICTs.
- Create YouTube videos for training on the use of ICTs.
- Encourage universal design of instruction practices in colleges and provide "extended time" to all students when speed is not of the essence. This could benefit not only students with LD, but also the substantial numbers of students who are poor readers or second (and third) language learners who have not yet mastered the language of instruction at their college.

Part C – Methodology

1. Methodological approach

This was a descriptive, comparative study. Additional details about the method and the findings are available in Fichten et al. (2012, 2013, in press).

2. Data collection

Phase 1 – Experts' views. During the 2009-2010 academic year we interviewed 58 experts who were knowledgeable about both LD and ICTs for students with LD. These findings were used to develop a questionnaire that was used in Phase 2 of this project.

Phase 2 – Students' views. In 2010-2011, 1889 students at three colleges (Dawson College, Collège Montmorency and Cégep André-Laurendeau) completed the Adult Reading History Questionnaire-Revised (ARHQ-R: Parrila, Georgiou, & Corkett, 2007) in class. This measure was used to categorize students as adequate, poor or very poor readers. (1) Students with LD, and samples of (2) very poor and of (3) adequate readers (based on the ARHQ-R) were invited to complete a reading comprehension test. Additional students with LD were solicited from campus disability services offices from the three colleges to increase the sample of students with LD. The three groups were invited to complete an online questionnaire about their experiences regarding the use of ICTs.

3. Samples

The samples used to evaluate ICTs use included 58 experts, 74 students with LD and 96 students without LD (53 adequate readers and 43 very poor readers).

4. Statistical analysis

Inferential statistics were used (MANOVA, ANOVA, X^2, t-test, correlation).

Part D – Results

Additional details about the method and the findings are available in Fichten et al. (2012, 2013, in press).

1. Key results

***Phase 1 – Experts' views*.** Responses of the experts show that the main perceived advantage of using ICTs for students with LD is to support and promote academic success: ICTs improve the quality of students' work and allow them to acquire the skills and techniques necessary for learning. The experts also signaled, however, first and foremost, the problems posed by the high cost of ICTs. Some of the other disadvantages were technical problems and the need for students to put in extra effort to learn how to use adaptive ICTs.

The most popular categories of helpful ICTs include multipurpose ICTs, both general use (e.g., Microsoft Office), and specialized (e.g., Kurzweil 3000, Wynn). These products can read text aloud, render paper documents into editable digital text, and highlight key concepts, among other things. Software that helps students write, including Antidote (grammar and spellchecker that works only in French) and WordQ (bilingual word prediction software), were also popular. Dictation software (voice recognition) was also seen as useful; Dragon Naturally Speaking was the most frequently mentioned.

Screen reading software, which reads digital text aloud (e.g., ReadPlease 2003), was also popular. This type of software allows students to listen to their course materials. Some even save voice files to MP3 (e.g., the free software Balabolka), which students can use on any MP3 device. Laptops and other lightweight devices as well as scanners with optical character recognition (OCR - allows conversion of paper documents into digital text) were also frequently mentioned, as was mind-mapping software such as Inspiration (helps organize ideas visually).

Suggestions for improvements relative to the use of ICTs by students and disability service providers in colleges. Results show that "more" was the most popular suggestion for improvements: more time (for ICT training), more space within the college (more specialized computer labs), more human resources and more funding. Sensitization and training (for students, campus disability service providers, faculty and other college personnel) was another common recommendation. To better assist students with LD, the experts also noted the need for more communication and collaboration among stakeholders within the college, between colleges and high schools, ICT resource centers, and academic support centers.

Phases 1 and 2 – Comparison of Experts' and Students' views.

ICTs used by students with LD and recommendations of experts

ICT	Students with LD	Experts
PC	84%	N/A
[b]Macintosh	26%	N/A
Multipurpose ICTs		
Office suite	86%	71%
[b]Kurzweil	6%	45%
Wynn	3%	19%
Médialexie (French language multipurpose software)	3%	17%
ClaroRead	N/A	5%
Dictation: Speech-to-Text		
Dictation software	10%	65%
SpeakQ	N/A	5%
Grammar/Spelling		
[a]Antidote (French language grammar/spelling software)	65%	47%
[a]WordQ	25%	29%
Electronic dictionary	58%	2%
Screen Reading: Text-to-Speech		
Software that reads what is on the screen	18%	38%
ReadPlease	4%	12%
MP3 to listen to books/texts	30%	2%
Reading		
E-book	11%	0%
E-book reader (e.g., Kindle, Sony)	4%	0%
PDF (e.g., Adobe Acrobat Reader)	74%	0%
Scanning and optical character recognition (OCR)		
[b]Scanning and optical character recognition (OCR)	27%	9%
C-Pen	N/A	9%
OpenBook	N/A	3%
Mind-Mapping/Concept Mapping		
Inspiration/Concept mapping	10%	41%
Recording		
Digital recorder	16%	16%
Smartpen	3%	3%
Other		
Laptop	85%	36%
[b]Smartphone/cell phone/iPod, etc.	69%	10%
[b]Instant messaging (e.g., MSN, Skype)	72%	0%
Digital course materials	N/A	5%
Online courses/notes	N/A	5%
Spark-Space	N/A	5%
Word highlighting feature	N/A	3%

Note. No significant difference between students from English and French colleges unless item is flagged with a superscript. N/A indicates that participants were not asked about this.
[a] French speaking students use significantly more often than English speaking students.
[b] English speaking students use significantly more often than French speaking students.

Phase 2 – Students' views and experiences with ICTs

- Students with LD have more difficulty using ICTs and are less knowledgeable about their availability and how to use them.
- Students report using mainstream technologies (e.g., smartphones, MP3) more often than experts.
- Several of the ICTs recommended by experts were not used by students with LD and several "newer" ICTs (e.g., smartphones, instant messaging) were used by students but not mentioned by experts.
- A significant number of very poor readers in colleges did not report having LD.
- Over 4% of the 1889 students in colleges sampled in this study reported having LD; approximately ⅓ of these students also had ADHD.
- Males and females, whether they had LD or not, did not differ in the number of ICTs that they used. Nor did students from two-year pre-university and three year career/technical programs.
- Most students (84% of students with LD and 85% of those without LD) use a PC.
- Students from the English college, whether they had LD or not, were significantly more likely to use a Macintosh than students from the French colleges.
- 44% of students with LD from the English college reported using a Macintosh, while only 26% of those without LD did so. Comparable figures for French colleges were 13% and 10% respectively.
- There were few significant differences in software use between students with LD from the French and English colleges: Antidote and WordQ were more frequently used in the French colleges while smartphones/cell phones/iPods, instant messaging, Kurzweil 3000 as well as scanning and optical character recognition were more frequently used in the English college.
- Among students without LD, there were only three significant differences: Antidote was more frequently used in the French colleges, while smartphones/cell phones/iPods and instant messaging were more frequently used in the English college.
- Students with LD from the English college were more likely than those from the French colleges to learn to use ICTs in high school or earlier. On the other hand, students from the French colleges were more likely to learn to use these on their own or in college.
- Overall, students from all three groups (LD, adequate and very poor readers) preferred courses that used ICTs and they felt that ICTs helped them complete their school work; there were no significant differences among the three groups or among students from English and French colleges on these dimensions.
- Overall, students reported that they were generally unlikely to miss classes when lecture notes were available online, although very poor readers were significantly more likely to do so than adequate readers or students with LD. Again, there was no significant difference between students from English and French colleges.
- Students with LD used significantly less diverse ICTs to complete various aspects of their school work than either adequate or very poor readers, who did not differ from each other. Students from French and English colleges did not differ significantly.
- For the use of course websites (e.g., Moodle), the results indicate that students with LD from French colleges are less likely to use these than those from the English college.
- ICT needs of students, both with and without LD, at the English college are significantly better met than those of students at the French colleges.
- Professors' use of e-learning better met the needs of students without LD than those of students with LD.
- Overall, the ICT related needs of students in the English college were better met than those of students from the French colleges.

2. Conclusions and possible solutions

- It is important to make students aware of ICTs that could help them not only with reading, but also with writing, spelling, organization, and memorization among other skills.
- Because students with LD used less diverse ICTs to complete their school work than the other groups, it is important to ensure that they are made aware of ICTs that could help them and be provided with adequate training on how to use them.
- Students and experts need to share their perspectives on which ICTs they find helpful.
- Students with LD should be taught to use both general use and specialized ICTs in high school or earlier.
- Once they enter college, students with LD need to be provided with diverse opportunities to learn how to use ICTs.
- Learning tools should be made available to campus disability service providers (e.g., glossaries on ICTs, resource lists, videos).

3. Key contributions

Our work contributes to a rather under-developed field of knowledge: the use of ICTs among junior / community college students with LD. Our work highlights the following.

- There are many students with LD in both English and French colleges.
- There are many poor readers in the colleges whose mother tongue is the language of instruction and who do not self-report having LD.
- Students with LD feel less comfortable and not as well prepared to use ICTs as their peers without LD.
- Students with LD, especially those attending French colleges, are not likely to learn to use specialized ICTs in high school.
- Students with LD often have problems with writing and organization, not merely with reading.

Part E – Future research

1. New directions and research questions

- What is the impact of different types of specialized ICTs (i.e., those which help with reading, writing, organization) on actual academic achievement, not merely on self-reports and experts' views?
- Does universal design of instruction (UDI) help students with LD to obtain good academic results?
- Why are students with LD not using ICTs that could be helpful to them?
- What are the best ways of providing training on specialized ICTs for students with LD and for very poor readers without LD?
- What are the characteristics of very poor readers who do not indicate that they have LD? This group requires further examination in terms of who they are and how to best meet their needs.

2. Main solution

It is important to support applied research on the impact of specialized ICTs on academic achievement.

Part F – Resources

Adaptech Research Network, *Free and Inexpensive Adaptive Technology Database*, website available at www.adaptech.org/en/downloads

Association québécoise des troubles d'apprentissage, *AQETA*, web site available at http://aqeta.qc.ca/

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APPENDICES

Interview Questions for Experts on the Use of ICTs by Students with Learning Disabilities at the Postsecondary Level (French Version)

1. Quel est le nom de votre établissement et où est-il situé?
2. a) Quel est le titre de votre emploi?

   b) Veuillez donner une description de votre emploi.
3. Quelles sont vos expériences en lien avec les TIC et les étudiants au niveau postsecondaire ayant des troubles d'apprentissage? Pensez aux cours enseignés entièrement en ligne, entièrement en classe et ceux qui sont enseignés partiellement en ligne et en classe. Pensez aussi aux TIC que les étudiants peuvent utiliser dans l'établissement et à la maison.
4. Selon votre opinion, quelles sont les TIC et les adaptations reliées aux TIC qui sont utiles pour les étudiants ayant des troubles d'apprentissage?
5. Quels sont les avantages pour les étudiants ayant des troubles d'apprentissage d'utiliser des TIC?
6. Quels sont les désavantages pour les étudiants ayant des troubles d'apprentissage d'utiliser des TIC?
7. Quelles améliorations reliées aux TIC pourraient être effectuées pour les étudiants ayant des troubles d'apprentissage au niveau postsecondaire?
8. Quelles améliorations reliées aux TIC pourraient être effectuées pour les répondants/conseillers pour les étudiants ayant des besoins spéciaux?
9. a) Au niveau postsecondaire, qui s'occupe de montrer aux étudiants ayant des troubles d'apprentissage comment utiliser les TIC dont ils ont besoin?

   b) Qui devrait s'en occuper?
10. a) Au niveau postsecondaire, qui s'occupe de montrer au corps professoral comment utiliser les TIC (ex : fournir du support et la formation pour les aider à rendre leur enseignement ou activités d'apprentissage accessibles aux étudiants ayant des troubles d'apprentissage)?

    b) Qui devrait s'en occuper?
11. a) Au niveau postsecondaire, qui s'occupe de régler les problèmes reliés à l'accessibilité des TIC pour les étudiants ayant des troubles d'apprentissage?

    b) Qui devrait s'en occuper?
12. a) Au niveau postsecondaire, qui s'assure que les TIC soient accessibles avant leur adoption ou achat pour les étudiants ayant des troubles d'apprentissage?

    b) Qui devrait s'en occuper?
13. a) Au niveau postsecondaire, qui s'assure que les TIC soient accessibles pour les travaux et examens d'étudiants ayant des troubles d'apprentissage?

    b) Qui devrait s'en occuper?
14. Qu'est-ce qui devrait être fait pour rendre les TIC plus disponibles et accessibles pour les étudiants ayant des troubles d'apprentissage?
15. Est-ce qu'il y a autre chose d'important ou de pertinent que je n'ai pas mentionné?

Citation: Fichten, C. S., King, L., Nguyen, M. N., Barile, M., Havel, A., Chauvin, A., Budd, J., Mimouni, Z., Raymond, O., & Juhel, J.-C. (2009). *Interview questions for experts on the use of ICTs by students with learning disabilities at the postsecondary level (French version)*. Montreal, Quebec: Adaptech Research Network.

Interview Questions for Experts on the Use of ICTs by Students with Learning Disabilities at the Postsecondary Level (English version)

1. What is the name of your institution and where is it located?
2. a) What is your job title?
   b) Please describe what your job entails.
3. What kinds of experiences have you had with ICTs and postsecondary students with learning disabilities? Think about courses taught entirely online, entirely in the classroom and those taught partially online and in the classroom. Think too about ICTs that students can use at school and those they can use at home.
4. In your opinion, what types of ICTs and ICT related accommodations are typically needed by students with learning disabilities?
5. What are the advantages of using ICTs for students with learning disabilities?
6. What are the disadvantages of using ICTs for students with learning disabilities?
7. What ICT related improvements could be made for postsecondary students with learning disabilities?
8. What ICT related improvements could be made for campus service providers?
9. a) At the post-secondary level who shows students with learning disabilities how to use needed ICTs?
   b) Who should?
10. a) At the post-secondary level, who helps teachers use ICTs (ex. provide support and training to make computer based teaching or learning activities accessible to students with learning disabilities)? b) Who should?
11. a) At the post-secondary level, who helps troubleshoot accessibility-related problems with ICTs for students with learning disabilities?
    b) Who should?
12. a) At the post-secondary level, who ensures that ICTs are accessible to students with learning disabilities before selection or purchase?
    b) Who should?
13. a) At the post-secondary level, who ensures that the school's ICTs are accessible to students with learning disabilities for assignments and exams?
    b) Who should?
14. What should be done to make ICTs more available and accessible for students with learning disabilities?
15. What else is important or relevant that I have not asked about?

Citation: Fichten, C. S., King, L., Nguyen, M. N., Barile, M., Havel, A., Chauvin, A., Budd, J., Mimouni, Z., Raymond, O., & Juhel, J.-C. (2009). *Interview questions for experts on the use of ICTs by students with learning disabilities at the postsecondary level (English version)*. Montreal, Quebec: Adaptech Research Network.

Adult Reading History Questionnaire – Revised (ARHQ-R) (French version)

Veuillez encercler la réponse qui décrit le mieux votre attitude ou expérience pour chacune des questions suivantes.

1. À l'école primaire, à quel point avez-vous eu des difficultés à apprendre à lire?

Aucune				Beaucoup
0	1	2	3	4

2. À l'école primaire, à quel point avez-vous eu besoin d'aide supplémentaire pour apprendre à lire?

Aucune aide	Aide des : amis	Professeurs/ parents	Tuteurs ou classe spéciale 1 année	Tuteurs ou classe spéciale 2 années ou plus
0	1	2	3	4

3. Quand vous étiez enfant, avez-vous déjà inversé l'ordre des lettres ou des chiffres?

Non				Beaucoup
0	1	2	3	4

4. Quand vous étiez enfant, avez-vous eu des difficultés à apprendre les noms des lettres et/ou des couleurs?

Non				Beaucoup
0	1	2	3	4

5. À l'école primaire, comment étaient vos habiletés de lecture en comparaison avec celles des autres élèves?

Supérieures à la moyenne		Moyennes		Inférieures à la moyenne
0	1	2	3	4

6. Quand vous étiez enfant, comment décririez-vous l'attitude que *vous* aviez envers la lecture?

Très positive				Très négative
0	1	2	3	4

7. À l'école primaire, comment était votre vitesse de lecture en comparaison avec celle des autres élèves?

Supérieures à la moyenne		Moyennes		Inférieures à la moyenne
0	1	2	3	4

8. À l'école primaire, à quel point avez-vous eu des difficultés à apprendre à épeler?

Aucune		Un peu		Beaucoup
0	1	2	3	4

9. À l'école primaire, combien de livres avez-vous lu pour le plaisir chaque *année*?

Plus que 10	6-10	2-5	1-2	Aucun
0	1	2	3	4

10. Combien de bandes dessinées avez-vous lu pour le plaisir chaque *année*?

Plus que 10	6-10	2-5	1-2	Aucune
0	1	2	3	4

Citation: Nguyen, M. N., King, L., Mimouni, Z., Fichten, C .S., & Barile, M. (2009). *Adult Reading History Questionnaire – Revised (ARHQ-R) (French version).* French translation of the *Adult Reading History Questionnaire-Revised (ARHQ-R)*. From Parrila, R., Georgiou, G., & Corkett, J. (2007). University students with a significant history of reading difficulties: What is and is not compensated? *Exceptionality Education Canada, 17*(2), 195-220.

Adult Reading History Questionnaire – Revised (ARHQ-R) (English version)

Please circle the number of the response that most nearly describes your attitude or experience for each of the following questions.

1. How much difficulty did you have learning to read in elementary school?

None				A great deal
0	1	2	3	4

2. How much extra help did you need when learning to read in elementary school?

No help	Help from: friends	Teachers/ parents	Tutors or special class 1 year	Tutors or special class 2 or more years
0	1	2	3	4

3. Did you ever reverse the order of letters or numbers when you were a child?

No				A great deal
0	1	2	3	4

4. Did you have difficulty learning letter and/or colour names when you were a child?

No				A great deal
0	1	2	3	4

5. How would you compare your reading skill to that of others in your elementary classes?

Above average		Average		Below average
0	1	2	3	4

6. Which of the following most nearly describes *your* attitude toward reading as a child?

Very positive				Very negative
0	1	2	3	4

7. How would you compare your reading speed in elementary school with that of your classmates?

Above average		Average		Below average
0	1	2	3	4

8. How much difficulty did you have learning to spell in elementary school?

None		Some		A great deal
0	1	2	3	4

9. When you were in elementary school, how many books did you read for pleasure each *year*?

More than 10	6-10	2-5	1-2	None
0	1	2	3	4

10. How many comic books did you read for pleasure each *year*?

More than 10	6-10	2-5	1-2	None
0	1	2	3	4

Citation: *Adult Reading History Questionnaire-Revised (ARHQ-R)*. Parrila, R., Georgiou, G., & Corkett, J. (2007). University students with a significant history of reading difficulties: What is and is not compensated? *Exceptionality Education Canada, 17*(2), 195-220.

Questionnaire on Students' Use of ICTs (French version)

Q1. Votre prénom

Q2. Indiquez votre sexe
Femme
Homme

Q3. Quelle est votre date de naissance? (Année / Mois / Jour)

Q4. Quel est le nom du collège auquel vous êtes (ou étiez) inscrit(e)?

Q5. Quel est (ou était) votre programme d'études au collège?
Programme préuniversitaire
Sciences humaines
Sciences de la nature
Arts et lettres / Cinéma et communication / Danse
Autre
Programme technique, veuillez préciser
Autre, veuillez préciser

Q6. Ceci est ma :
1re année
2e année
3e année
4e année
5e année
6e année ou plus

Q7. Quelle est la langue dans laquelle vous êtes le(la) plus à l'aise en ce qui concerne la lecture?

Q8. Au total, combien de langues pouvez-vous lire aisément?
1
2
3
4
5 ou plus

Q9. Est-ce que vous avez un trouble du déficit de l'attention (TDA/H)?
Oui
Non

Q10. Est-ce que vous avez un trouble d'apprentissage (ex : dyslexie, trouble auditif central)?
Oui
Non

Q11. Est-ce que vous avez un autre handicap?
Oui
Non
Si oui, veuillez préciser lequel.

Q12. Si oui, êtes-vous inscrit(e) pour recevoir des adaptations scolaires / des services pour les étudiants ayant des handicaps à votre collège (ex : temps supplémentaire pour les examens)?

Oui
Non

Q13. Par rapport aux autres étudiants de votre programme d'études, comment vous classeriez-vous académiquement?

Dans le premier tiers
Dans le deuxième tiers
Dans le dernier tiers
Je ne sais pas

Q14. Quelles technologies informatiques (ex : Microsoft Word, téléphone intelligent, eBook) vous aident à :

a. Lire?
b. Rédiger?
c. Prendre des notes?
d. Étudier?
e. Faire des mathématiques?
f. Faire des présentations?
g. Faire des tests / examens?
h. Être organisé(e)?
i. Faire d'autres activités scolaires? (Veuillez préciser)

Q15. Pour chacun des énoncés suivants, indiquez votre degré d'accord.

Fortement en désaccord
Modérément en désaccord
Légèrement en désaccord
Légèrement en accord
Modérément en accord
Fortement en accord
Non Applicable

Ne passez pas trop de temps sur une question. Indiquez simplement la réponse qui décrit le mieux votre situation. Si un item ne s'applique pas à vous, inscrivez "Non applicable".

a. J'aime les cours qui utilisent les technologies informatiques.
b. Utiliser les technologies informatiques m'aide dans mes travaux scolaires.
c. Je vais rarement en classe lorsque les notes de cours sont en ligne.
d. Quand j'ai commencé le collège, j'étais bien préparé(e) à utiliser les technologies informatiques dans mes travaux scolaires.
e. J'utilise régulièrement les sites Web des cours (ex : Moodle, LÉA, DECclic)
f. Je m'y connais très bien dans l'utilisation des technologies informatiques.
f. Je suis très à l'aise avec l'utilisation des technologies informatiques.

Q16. Pour chacun des énoncés suivants, indiquez votre degré d'accord.

1. Mon collège a suffisamment d'ordinateurs avec accès à l'Internet pour répondre à mes besoins.
2. Les heures d'accès aux technologies informatiques à mon collège répondent à mes besoins.
3. À mon collège, les technologies informatiques sont suffisamment à jour pour répondre à mes besoins (ex : correcteur grammatical, souris adaptée, lecteur d'écran).
4. Mon collège a suffisamment de technologies informatiques dans les laboratoires spécialisés / centres de services pour étudiants ayant des incapacités pour répondre à mes besoins.
5. Mon collège a suffisamment de technologies informatiques dans les laboratoires informatiques destinés à tous les étudiants pour répondre à mes besoins.
6. À mon collège, le programme de prêt de technologies informatiques répond à mes besoins.
7. Les subventions pour les technologies informatiques servant à mon utilisation personnelle répondent à mes besoins (ex : gouvernement, fondation, centre de réadaptation, programme de prêts).
8. À mon collège, le soutien technique fourni pour les technologies informatiques répond à mes besoins.
9. Lorsque je rapporte aux membres du personnel de mon collège des problèmes reliés à l'accessibilité des technologies informatiques, ils agissent rapidement pour les résoudre (ex : ne peut voir la présentation PowerPoint, ne peut écouter un vidéo clip, besoin d'un correcteur grammatical pour une rédaction).
10. À mon collège, il y a au moins un membre du personnel qui possède une expertise en matière de technologies informatiques adaptées (ex : possède des connaissances sur les logiciels de lecture d'écran, garde ses connaissances à jour sur les plus récents modèles de claviers adaptés).
11. La disponibilité du soutien technique lorsque je ne suis pas au collège répond à mes besoins (ex : l'assistance technique du collège / vendeurs).
12. Je sais comment utiliser de manière efficace les technologies informatiques dont j'ai besoin.
13. La formation offerte par mon collège sur l'utilisation des technologies informatiques répond à mes besoins.
14. À mon collège, un soutien informel est disponible au besoin pour m'indiquer comment utiliser les technologies informatiques.
15. La formation sur l'utilisation des technologies informatiques offerte hors du campus répond à mes besoins.
16. Lorsque les enseignants utilisent le cyber-apprentissage, il m'est accessible (ex : PowerPoint en classe, notes de cours sur Internet, CD-ROMs).
17. Je n'ai pas de difficultés lorsque les enseignants utilisent le cyber-apprentissage pour les tests et examens (ex : tests en ligne).
18. Les cours à distance offerts par mon collège me sont accessibles.
19. Je suis en mesure d'utiliser facilement les technologies informatiques que j'amène en classe (ex : je peux les brancher).
20. Je me sens à l'aise d'utiliser les technologies informatiques nécessaires en classe.
21. À mon collège, les services en ligne me sont accessibles (ex : inscription, formulaire d'aide financière par Internet).
22. L'accessibilité du système informatique de la bibliothèque répond à mes besoins (ex : répertoire, bases de données, CD-ROMs).
23. Mes technologies informatiques personnelles sont suffisamment à jour pour répondre à mes besoins.
24. À mon collège, l'accès physique aux technologies informatiques répond à mes besoins (ex : table réglable, porte assez large).
25. Les sites Web de mon collège me sont accessibles.
26. La disponibilité du matériel de cours en format électronique répond à mes besoins (ex : Word, PDF, MP3).

Q17. Indiquez les technologies que vous utilisez pour vos travaux scolaires.
(Oui/Non)

J'utilise un PC
J'utilise un Macintosh

Antidote
Cellulaire / Téléphone intelligent / iPod, etc.
Ordinateur portable
Logiciel de dictée vocale / Reconnaissance vocale / Dragon Naturally Speaking / MacSpeech Dictate
Enregistreur numérique
eBook
Lecteur d'eBook (ex : Kindle, Sony)
Dictionnaire électronique
Inspiration
Messagerie instantanée (ex : MSN, Skype)
Kurzweil
Médialexie
MP3 pour écouter des livres/textes
Suite Office (ex : Microsoft Office, OpenOffice, iWork)
PDF (ex : Adobe Acrobat Reader)
ReadPlease
Scanneur et reconnaissance optique de caractères (OCR) (ex : scanne et lit des documents papier)
Smartpen
Logiciel lisant ce qui est à l'écran (ex : lecteur d'écran, texte-à-parole, écoute de texte au lieu de lecture)
WordQ
Wynn
Autre, veuillez préciser

Q18. Où avez-vous appris à utiliser ces technologies?

Q19. Énumérez trois exemples où votre professeur(e) a utilisé des technologies informatiques d'une manière efficace (c.-à-d. qui fonctionnait bien pour vous).

Q20. Énumérez trois exemples où votre professeur(e) a utilisé des technologies informatiques d'une manière inefficace (c.-à-d. qui ne fonctionnait pas bien pour vous).

Q21. Énumérez trois obstacles (choses qui rendent difficile) à l'utilisation des technologies informatiques dans les travaux scolaires.

Q22. Énumérez trois facilitateurs (choses qui rendent facile) à l'utilisation des technologies informatiques dans les travaux scolaires.

Q23. Si les technologies informatiques pouvaient tout faire pour vous aider à réussir plus facilement au college, qu'est-ce qu'elles feraient?

Citation: Fichten, C. S., Nguyen, M. N., King, L., Havel, A., Mimouni, Z., Barile, M., Raymond, O., Budd, J., Chauvin, A., Juhel, J.-C., & Gaulin, C. (2011). *Questionnaire on students' use of ICTs (French version)*. Montreal, Quebec: Adaptech Research Network.

Questionnaire on Students' Use of ICTs (English version)

Q1. Your first name

Q2. Your gender
Female
Male

Q3. Your date of birth (Year / Month / Day)

Q4. What is (or was) the name of the College you currently attend (or last attended)?

Q5. What is (or was) your program of study?
Pre-university program
Social Science
Science
Creative Arts Literature & Languages
Other
Career/Technical program, please specify
Other, please specify

Q6. This is my:
First year
Second year
Third year
Fourth year
Fifth year
Sixth year or more

Q7. What is the language that you read most easily?

Q8. In total, how many languages do you read well?
1
2
3
4
5 or more

Q9. Do you have attention-deficit disorder (ADD / ADHD)?
Yes
No

Q10. Do you have a learning disability (e.g., dyslexia, auditory processing disorder)?
Yes
No

Q11. Do you have another disability?

Yes
No

If yes, please specify

Q12. If yes, are you registered to receive disability related services / academic accommodations from your College (e.g., extra time on exams)?

Yes
No

Q13. Compared to the rest of the students in your program of study, how would you rank yourself academically?

In the top third
In the middle third
In the bottom third
I don't know

Q14. Which computer technologies (e.g., Microsoft Word, Smartphone, e-book) help you to:

a. Read?
b. Write?
c. Take notes?
d. Study?
e. Do math?
f. Do presentations?
g. Do tests / exams?
h. Be organized?
i. Do other school work? (Please specify)

Q15. For all statements, rate your level of agreement.

Strongly Disagree
Moderately Disagree
Slightly Disagree
Slightly Agree
Moderately Agree
Strongly Agree
Not Applicable

Do not spend too much time on any one statement. Simply give the answer which best describes your general situation. If an item is not applicable to you, respond with 'Not applicable'.

a. I like courses that use computer technologies.
b. Using computer technologies helps me do my school work.
c. I rarely attend class when lecture notes are online.
d. When I started College, I was well prepared to use computer technologies for my school work.
e. I use course websites regularly (e.g., Moodle, LÉA, DECclic)
f. I am very knowledgeable in the use of computer technologies.
g. I am very comfortable using computer technologies.

Q16. For all statements, rate your level of agreement.

1. My College has enough computers with internet access to meet my needs.
2. The hours of access to computer technologies at my College meet my needs.
3. At my College, computer technologies are sufficiently up to date to meet my needs (e.g., grammar checking, adaptive mouse, software that reads what is on the screen).
4. There are enough computer technologies in my College's specialized labs/centres for students with disabilities to meet my needs.
5. The availability of computer technologies in my College's general use computer labs meets my needs.
6. My College's loan program for computer technologies meets my needs.
7. Funding for computer technologies for personal use is adequate to meet my needs (e.g., government, foundation, rehab center, loan program).
8. The technical support provided at my College for computer technologies meets my needs.
9. When I approach staff at my institution with problems related to the accessibility of computer technologies on campus they act quickly to resolve any issues (e.g., cannot see the PowerPoint presentation, cannot hear a video clip, need a grammar checker to write an essay).
10. There is at least one person on staff at my College who has expertise in adaptive hardware and software (e.g., knowledgeable about software that reads what is on the screen, keeps up to date with the latest in adapted keyboards).
11. The availability of technical support when I am not at my College meets my needs (e.g., College IT help desk, vendor support).
12. I know how to effectively use the computer technologies that I need.
13. Training provided by my College on how to use the computer technologies meets my needs.
14. Informal help is available at my College to show me how to use computer technologies if I need this.
15. Training available off campus on how to use computer technologies meets my needs.
16. When professors use e-learning, it is accessible to me (e.g., PowerPoint in the classroom, course notes on the web, CD-ROMs).
17. I have no problems when professors use e-learning for tests and exams (e.g., online tests).
18. Distance education courses offered by my institution are accessible to me.
19. If I bring computer technology into the classroom I am able to use it (e.g., can plug it in).
20. I feel comfortable using needed computer technologies in the classroom.
21. My College's interactive online services are accessible to me (e.g., registering, financial aid applications on the web).
22. The accessibility of the library's computer systems meets my needs (e.g., catalogues, databases, CD-ROMs).
23. My personal computer technologies are sufficiently up-to-date to meet my needs.
24. The physical access to computer technologies at my College meets my needs (e.g., adjustable table, wide enough doorway).
25. My College's web pages are accessible to me.
26. The availability of electronic format course materials meets my needs (e.g., Word, PDF, MP3).

Q17. Indicate the technologies that you use for school work.
(Yes/No)

I use a PC
I use a Macintosh

Antidote
Cell phone / Smartphone / iPod, etc.
Laptop
Dictation software / Voice recognition / Dragon Naturally Speaking / MacSpeech Dictate
Digital recorder
E-book
E-book reader (e.g., Kindle, Sony)
Electronic dictionary
Inspiration
Instant messaging (e.g., MSN, Skype)
Kurzweil
Médialexie
MP3 to listen to books/texts
Office suite (e.g., Microsoft Office, OpenOffice, iWork)
PDF (e.g., Adobe Acrobat Reader)
ReadPlease
Scanning and optical character recognition (OCR) (e.g., scans and reads paper documents)
Smartpen
Software that reads what is on the screen (e.g., screen reader, text-to-speech, listen to text instead of reading it)
WordQ
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Other, please specify (Textbox)

Q18. Where did you learn to use these technologies?

Q19. List three examples where your teacher used computer technologies effectively (i.e., in a way that worked well for you).

Q20. List three examples where your teacher used computer technologies ineffectively (i.e., in a way that didn't work well for you).

Q21. List three obstacles (things that make it harder) to using computer technologies for school work.

Q22. List three facilitators (things that make it easier) to using computer technologies for school work.

Q23. If computer technologies could do anything to help you succeed more easily in College, what would they do?

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