

## Talking About People, not Technology: Web Accessibility

Natasha Boskic, Kirsten Bole

*The University of British Columbia, Vancouver, Canada*

*natasha.boskic@ubc.ca, kbole@interchange.ubc.ca*

*Phone: 1.604.822.1831, Fax: 1.604.822.2015*

### Abstract

*This paper presents a set of case studies used for "Web Content Accessibility" project at the University of British Columbia, Vancouver. Having a focus group as a springboard for approaching accessibility issues demonstrates that accessibility is about people, not technologies. Great efforts have been made to give every learner equal access to high-quality learning, and to remove barriers for people with disabilities. However, most of these efforts are focused on the traditional classroom experience. Less attention is devoted to those taking courses fully online, and their ability or inability to cope with web-based interactive content. While standards and guidelines have been developed to support and assist with accessible web design, their primary focus has been on technical specifications, assistive technologies, or legal issues. Fewer studies have been conducted to investigate how that "accessible" content is perceived from a learner's perspective, and how helpful it really is.*

### 1. Introduction

"Web Content Accessibility", proposed by the University of British Columbia, Vancouver, was one of the awarded projects in 2005 funded by BC campus, a portal for British Columbia post-secondary students. For this project, a number of modules from a variety of existing electronic courses in the Faculty of Education at UBC were analyzed. Adaptations and necessary changes were made inside WebCT, the university-wide content management system (CMS). Through consultation and collaboration with users, advocacy groups and other university and government agencies, Simon Fraser University (SFU) and Special Education and Technology – British Columbia (SET-BC), these different modules were encoded to be as "user friendly" as possible for persons with disabilities. The

existing academic content served as practical "test beds" for enhanced accessibility. The experimenting and testing was performed through close collaboration with SET-BC and focus groups. The ultimate goal was to provide online learners with disabilities, who were academically qualified, to have full, fair and equal access to all University services, and programs.

### 2. Background

Universities are increasingly becoming involved in technology-based education programs. The level of sophistication of such offerings (cohort organizations, electronic learning) is accelerating rapidly. However, it is not always the case that persons with disabilities, taking courses off-campus, are provided with the same rights to access and program accommodation as those on-campus. In some cases the lack of high-speed internet access is a problem, and in other cases electronic course offerings coming from the university have not been encoded to support adaptive technologies (like Braille display, enhanced print size, voice-over, sip and puff control, etc.). This results in inequities in academic access. Conformance with the World Wide Web Consortium's (W3C) Web Content Accessibility Guidelines 2.0 will enhance the market share and audience reach of programs by increasing their general usability. Adoption of WCAG 2.0 recommendations also demonstrates a commitment to social responsibility and equity of access to education, information and services.

### 3. Situation at the University of British Columbia

It is the policy of UBC (and it is similarly stated in virtually every other university policy in Canada) that "...the University is committed to providing access for students with disabilities while maintaining academic

standards” (UBC Student Services, 2006, para. 1)[2]. This is in keeping with UBC Policy no. 73 that states that UBC recognizes its moral and legal duty to provide academic accommodation. The University must remove barriers and provide opportunities to students with a disability, enabling them to access University services, programs and facilities and to be welcome as participating members of the University community. The Policy goes on to note that such accommodation is in accordance with the B.C. Human Rights Code and the Canadian Charter of Rights and Freedoms. Universities have worked hard to write and implement policy that improves access to campus buildings, ensures the health and safety of those with disabilities, and which provides appropriate supplementary support in the facilitation of learning.

The External Programs and Learning Technologies office (EPLT) at UBC acts as the facilitator for all off-campus Faculty of Education programs, both domestic and international. EPLT seeks to use innovative, efficient and effective delivery vehicles that are first and foremost designed to meet the diverse needs of learners and to provide them with access to the highest quality programs possible. The main goal of the project “Web Content Accessibility” was to improve usability and accessibility of EPLT online course content to both disabled and non-disabled learners.

#### 4. Laws and Standards

In the United States, a law called Section 508 requires federal agencies to ensure that people with disabilities have the same access to information in electronic systems as people without disabilities.

*Section 508 requires that when Federal agencies develop, procure, maintain, or use electronic and information technology, Federal employees with disabilities have access to and use of information and data that is comparable to the access and use by Federal employees who are not individuals with disabilities, unless an undue burden would be imposed on the agency. Section 508 also requires that individuals with disabilities, who are members of the public seeking information or services from a Federal agency, have access to and use of information and data that is comparable to that provided to the public who are not individuals with disabilities, unless an undue burden would be imposed on the agency. (Section 508, 2006, Subpart A – General, para. 1)[3]*

In the United Kingdom, there is a similar law known as SENDA (Special Educational Needs and Disabilities Act). Canada has no such law at the moment, but the Canadian Human Rights Act and the Charter of Rights

and Freedoms both deal with discrimination on the basis of many factors, including disability. A failure to provide information in an accessible format could be considered discrimination if no reasonable attempt is made to accommodate the disabled person.

There is a set of guidelines established by the World Wide Web Consortium (W3C), a group that establishes specifications, guidelines, software and tools for various aspects of the web including file formats and scripting languages. One W3C program is the Web Accessibility Initiative (WAI), whose mission is to help make the Web accessible to people with disabilities.

#### 5. Problem

The term “disability” is very broad, and can include persons with sensory impairments (blind or visually impaired, deaf or hard of hearing), learning disabilities, motor functioning problems, or neurological impairments. The number and severity of challenges increases with the age of the population served – especially in the area of sensory impairment. For example, while the Federal government reports that the overall disability rate in the total population is about 12.4% (Statistics Canada, 2001, para. 1).- for persons between the age of 65 and 74 it increases to 31.2% (Statistics Canada, 2001, para. 2)[1].

Great efforts have been made to give every learner equal access to high-quality learning, and to remove barriers for people with disabilities. However, most of these efforts are focused on the traditional classroom experience. Less attention is devoted to those taking courses fully online, and their ability or inability to cope with web-based interactive content. While standards and guidelines have been developed to support and assist with accessible web design, their primary focus has been on technical specifications, assistive technologies, or legal issues. Fewer studies have been conducted to investigate how that “accessible” content is perceived from a learner’s perspective, and how helpful it really is.

#### 6. Testing Accessibility

There are a number of tools available to help in checking some of the more technical aspects of a website to see if it meets accessibility standards. One of these is WebXact Watchfire (<http://webxact.watchfire.com/>). It is a useful tool for double-checking that some of the more technical requirements of accessibility are satisfied, such as confirming that all images are accompanied by

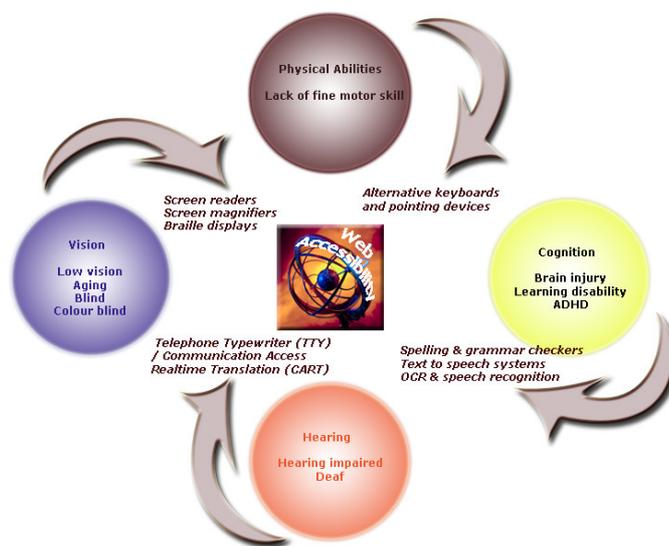
alternative text, or that data tables are properly labelled.

But using these tools is not enough. An accessibility analyzer cannot determine if the descriptions of images make sense to a blind user, or if page titles are meaningful. A web material needs to be considered from a human perspective, and many of the WAI guidelines ask to examine the context and meaning of online content more carefully.

Despite the difficulties with the guidelines' implementation and reliability, and the necessity of manual checking for accessibility, WCAG are very helpful in the initial stages of developing an online

resource. The guidelines should not be taken as the only set of criteria that needs to be considered. A wider set of issues must be addressed, some of which could even be in conflict with the guidelines.

A need for a holistic approach to accessibility is required, taking into consideration specific disabilities, difficulties that online students have, the available assistive technologies they can use to aid their learning process, all as seen through the lenses of the unique features of the online environment. See Figure 1 as a graphic representation of the important elements and their relations.



**Figure 1. Holistic approach to the issues about accessible design**

## 7. Cases

After attaining familiarity with the accessibility guidelines, tools and resources, the next step is finding the best way to adapt the existing online learning material. To achieve this, a focus group was created out of people with different disabilities (visual, hearing and motor impairments). They were invited to give their feedback on already designed course materials within the courses that had gone through a series of online offerings. Based on their comments, a number of modifications and redesigns had been done on five courses that were piloted in summer 2006 as “accessible courses”.

The names in these cases have been changed for privacy reasons.

### 7.1. Case #1: Samuel

**7.1.1. Description.** Samuel is a hard-of-hearing ESL student from Korea. Online courses had been recommended to him as a good choice to remove the barrier of his impairment.

**7.1.2. Issues.** Samuel was surprised and disappointed with the amount of text-based material in the courses that he took. He compared them with the online courses in Korea, which included a considerable amount of video excerpts. Because English is not his native language, Samuel struggles in traditional classroom classes. Despite that, he would rather meet face-to-face, or use a webcam to see emotions and gestures, than attempt to pick them up from text alone.

**7.1.3. Comment and recommendation.** Making content text-only does not necessarily make it more accessible. It works well with a screen reader, but there is no benefit for a hearing-impaired student. Instead of omitting all the media, more attention should be devoted to the navigational structure, organization of the content (cutting it into smaller

sections, dividing paragraphs with spaces, using distinguishable headings, etc), and providing alternatives to pure audio, such as transcripts, or captions for video components. See the example in Figure 2, where a video segment is accompanied by transcripts and audio.

The screenshot shows a web page with a dark blue header containing 'Table of Contents' and 'Watch/listen/read'. On the left, a table of contents lists: A. The Real Global Village, B. Watch/listen/read (highlighted), C. Browsing the Links, and D. Reflective writing. The main content area includes a link to 'Hear the Overview read aloud', a paragraph about a BCTF Taskforce on Racism, and a 'Notes' section with three bullet points. Below this is a grid with four columns: 'Slide-Show' and 'Media' repeated. The grid contains images of a slide titled 'RACISM & CULTURAL DISCRIMINATION IN BC', a newspaper clipping 'The Sun', and links to 'Transcript Part 1' through 'Part 5' and 'Audio Reading Part 1' through 'Part 5'.

**Figure 2. Providing audio and transcripts with a media component**

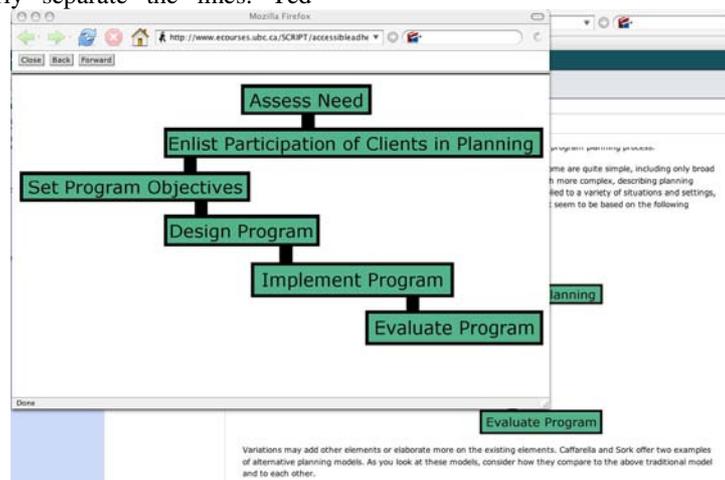
**7.2. Case #2: Ted**

**7.2.1. Description.** Ted is an ESL teacher with a condition, which causes his eyeballs to continue rotating when focusing on an object. He does not often use a computer, as he has to learn programs by memory rather than use visual cues. He finds himself lost when searching on the Internet.

**7.2.2. Issues.** For Ted, text tends to wobble: small text is very difficult to read, and line spacing must be great enough to clearly separate the lines. Ted

increases the font size in his browser when reading from the Web.

**7.2.3. Comment and recommendation.** One of the main goals here was to help Ted focus on the page. The layout of the pages was improved and made easier to read, with shorter line length and greater line spacing. The title of the active page in the Table of Contents was highlighted. The graphics that are too small have a "magnifying glass" option to zoom the image. See example in Figure 3.



**Figure 3. Enabling “magnifying glass” to zoom the image**

Using a screen reader, such as Wynn, is recommended. The tool highlights the lines of text currently being read. Ted uses his finger to follow the line of text. This software will help his eyes focus on the highlighted portion of the content, as well as provide an audio option.

### 7.3. Case #3: Robert

**7.3.1. Description.** Robert had nerve damage to his right hand and cannot use a standard keyboard. A standard mouse is also difficult for him to use, so he usually uses a tablet. He recently acquired a Frogpad, a one-handed, twenty-key keyboard that uses key combinations. So far he can type about 10-20 words per minute.

**7.3.2. Issues.** Robert requires additional time when writing exams, especially when handwriting; he prefers to type even though it is still slow. He says he would be unlikely to use a discussion board or chat room. To date, he has not used voice tools, but says he could not use them in a crowded lab.

**7.3.3. Comment and recommendation.** Making special arrangements for assignments, such as extending the deadline, or submitting it in a different format is a solution that has to be discussed with an instructor. In most cases, students who have problems and need special accommodations do not report them to their instructors. A note coming from the instructor or administrator at the beginning of the course, explaining the possibilities of those accommodations, will encourage students to express their concerns.

Introducing voice tools, such as voice discussion board, for example, may save Robert's typing time and effort.

### 7.4. Case #4: George

**7.4.1. Description.** George has been blind since birth, and relies on a computer with JAWS for Windows, a talking screen reader program, which enables him to access the Internet as well as many other PC applications.

**7.4.2. Issues.** George has taken courses online in the past, but finds them cumbersome to navigate, as WebCT is based on frames and tends to repeat the same options many times.

**7.4.3. Comment and recommendation.** Students using JAWS can shortcut to the links alone on the page, but too often the text within the link says something ambiguous like "click here", which loses all meaning when taken out of context. This can be remedied by making certain that the text link contains more information about the link itself, such as "download the May schedule".

Additionally, George emphasizes that the alternative text in images is important; it needs to be meaningful. He would rather not have an image described in detail if it is not key to the functionality of the site. If it is a diagram, however, that is not easily described with a few words; a longer description is needed, such as in the example in Figure 4. This piece of text explains the diagram, ensuring that no relevant information is lost.

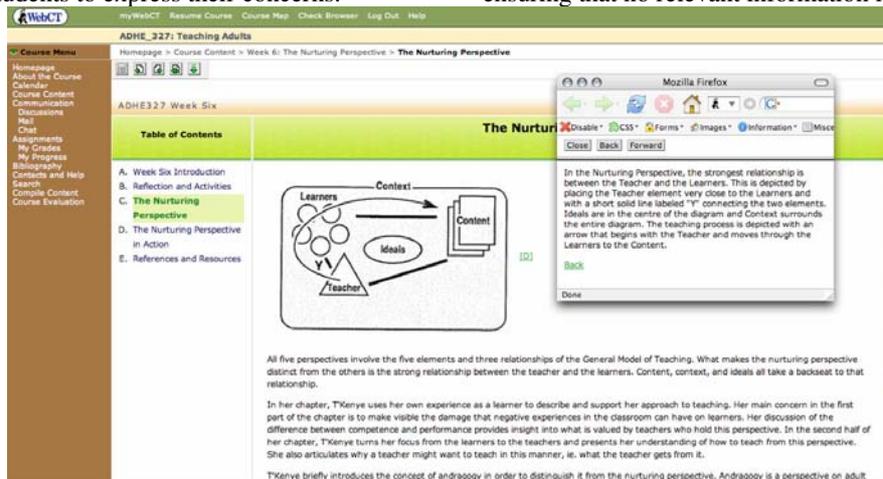


Figure 4. Providing a long description for a diagram

## 7. Discussion

If a site is inaccessible to users with disabilities, a section of the population is automatically excluded from its content. If it is a corporate site, this translates to lost business and possibly some bad press. If a site is an academic course and some of the students cannot access the course materials, the situation is more serious: these students could be placed at a distinct disadvantage and their coursework could suffer as a result. The quality of a learning experience is much difficult to measure. The material that is inaccessible to a student with one type of disability could be offered in alternative format and still delivered to the learner.

The reality is that accessibility is a way of enhancing a website, and it can be done seamlessly without compromising the design. Many of the recommendations and guidelines for making a site accessible actually improve the integrity of a site's code and the overall usability. Making online courses accessible to students with disabilities benefits all students, regardless of their physical and mental condition.

## 8. Conclusion

Many site designers and developers drag their feet and grumble when asked to make their site accessible. There is a mistaken perception that "accessibility" means "dumbing down" the site; that they will not be allowed to use any graphics or any multimedia. Frequently, websites address accessibility by making a plain, text-only version of every page and labelling it "accessible". This does no one any favours. It requires the webmaster to maintain twice the number of pages, and provides an inelegant solution that lumps all disabled users into the same category.

As distance learning adapts to accommodate new technology, so should instructors be innovative in the relationship with their students, and in the methods for developing educational content, accommodating the diverse needs and learning styles.

It should also be realized that not everything could be made accessible without compromising the value of the learning experience. The materials should be made as accessible as possible to most groups of disabled students, although some may still be excluded. In these cases, alternative exercises should be made available by the instructor.

## 8.1 Limitations

There are some limitations to this study. The issues that still need to be addressed are: a) looking into different Course Management Systems besides WebCT, and how they respond to modifications, b) testing how systems work with various assistive technologies, and c) checking into different organizational support mechanisms.

## 9. References

- [1] *A profile of disability in Canada*, 2001. Retrieved May 16, 2006 from Statistics Canada web site: <http://www.statcan.ca/english/freepub/89-577-XIE/canada.htm>
- [2] *Faculty & Staff Disability Resources: Accommodating students with disabilities*. (n.d.) Retrieved May 16, 2006 from University of British Columbia, Student Services web site: <http://students.ubc.ca/facultystaff/disability.cfm?page=students>
- [3] *Section 508 Standards* (2006, January 23). Retrieved May 16, 2006 from: <http://www.section508.gov/index.cfm?FuseAction=Content&ID=12>