

Accessibility and D2L: Can You Read This if You're Blind?

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This paper reports on the accessibility and usability of the Desire to Learn (D2L) course management software, version 7.4.x. We did not attempt to review every tool (called widgets by D2L), but looked at what we determined would be the most widely widgets used: the course list page, contents, calendar, discussions, and e-mail. We found that many problems affect all aspects of the product, regardless of which tool is being examined. We have shared this information with D2L and many of these problems identified here are slated to be fixed in future releases, and, therefore, may be resolved by the time of the conference in August 2005. We checked the D2L site at The Ohio State University (D2L is called "Carmen" at Ohio State) using the screen readers Home Page Reader, version 3.04 (HPR; IBM Corporation, 2004), and JAWS, version 5.10.383, (Freedom Scientific, 2004). We browsed the Web using Microsoft's Internet Explorer (Microsoft Corp., 2004), version 6.0 with SP2 and the AIS Web Accessibility Toolbar (Accessible Information Solutions, 2005) installed, and with Mozilla's Firefox (Mozilla Foundation, 2005) using the Web Developer and Tidy extensions, and the *Accessibility Extensions for Firefox* from the University of Illinois (iCITA, 2005). Finally, we checked only the student view of D2L as accessibility for students must be the highest priority.

D2L (Carmen) Home Page

After logging in, students are taken to the list of courses in which they are enrolled. This page is laid out in three frames: Navigation Links, Notification, and Contents. The Navigation Links frame contains a "frame description" and a "skip navigation" link. Unfortunately, neither of these links work. The frame description link returns an error. The skip navigation link apparently lacks a target and therefore just repeats if you click on it. (Throughout D2L pages there are skip navigation links – none of which work.) The Notification frame was empty on my website (JAWS doesn't even list it). For the visual user, the Contents frame was composed of five tables. Each of these visible tables contained a summary element, which was blank, and a link to skip the table, which works in HPR and speeds navigation, but JAWS does not recognize the link. There is no way to tell if new information has been added to any of these widgets so a person would need to read through each one every time to be sure nothing was missed. Multiple layout tables are used to visually present the page. First, there is a large layout table that creates the three columns in the Contents frame. All subsequent tables contain at least one nested table, but more typically two or three. Home Page Reader reports there are 20 tables on this page. It is disconcerting, however, to hear that one is about to hit a nested table with five columns and five rows.

Each widget is another nested table with a minimum of five columns and five rows, regardless if any content is included within the table. Fortunately, these tables are very simple and read correctly (i.e., they linearize well); however, because of the nesting structure, a person cannot easily use table navigation to move easily between nested tables and the document. We also noticed that there is a graphic called "N slash pixel" and another called "hide" in each widget. The "N slash pixel" appears to be caused by poorly formed HTML: the alternative text HTML attribute is written as alt=' ' instead of alt="" – which the screen readers cannot interpret as an alt-tag. The "hide" links has the same name in all the tables and hides, or minimizes, the table. Links should not all have the same name because they useless when read out of

context preventing a person using a screen reader from navigating the page by listing the links. These links should give the name of the table that will be hidden as part of the alternative text.

The Course Home Page

Once in the course, the student is presented with a layout similar to the D2L home page: navigation frame on the top, a notification frame (which is empty), and a contents frame. The contents frame, again, is laid out similarly to D2L home page with "widgets" on the left and (in our course) News in the middle. A widget for links is added to our page in a column on the right. One advantage of D2L is the flexibility it provides the designer. Thus, the pages of others may not look exactly the same as our page, but it is hard to imagine a D2L course without a link to course content (lessons, readings, assignments, etc.). Thus, it is to content that we now turn our attention.

Content

Once students know that most of the course information and activities will be in the "Content" section, it is easy to navigate to desired information. By default, the main body of our site was divided into two frames, where previously a layout table was used. The new frame was on the left and contained links to each of the modules, thus serving as a table of contents. The frame, however, was named "???TERM NOT FOUND???"-->LMS Navigation TOC Navigate Course Modules." This was obviously of little help. We fixed this problem by changing the layout so that this table of contents was no longer displayed. This greatly simplified navigation of the content, which is now merely a series of links separated, if so designed, into modules. If the modules were coded as headings (h1, h2, etc.) they could be navigated quickly and might replace the need for the navigation frame.

One opens a topic by choosing the appropriate link. In JAWS, this added a new frame, which provided a list of available actions (e.g., displaying as a new page or moving between topics). As a general design issue, repeated toolbars can be confusing for both sighted and non-sighted users, and using unfamiliar terms can heighten confusion. For example, what does "Undock" mean? Also, buttons appear for functions that cannot be used (e.g., the discussion button appears even there is no discussion for the topic). Activating any of these "unavailable" tools resulted in adding an element to the history list, which then prevented the browser's BACK button from working.

JAWS read the topics without difficulty. Home Page Reader opened the topic and read the frame with the action buttons, but the user had to manually move to the next frame. A blind user might not know there was any content.

Calendar

When entering the calendar page, JAWS says nothing – it doesn't even announce that a new page has opened. Assuming you can somehow get to the frame that contains the calendar, both JAWS and HPR are pretty confused. The table contains a summary but is otherwise not set up properly. Making the month the caption (<caption>) would cause the month to be read, which would help orient the reader. Also, making the days of the week header cells (<th>) would improve the table's readability. Creating a column with the week numbers and designating them as header cells would then give each cell reference points. Both JAWS and HPR begin by just reading the table from right to left. The small arrows that allow a user to move one month forward or one month back do not have alt-tags and are read as "link image arrow left [or right]," which doesn't tell the reader what will happen if the link is clicked.

Date Navigation

Each month displays as a table with a cell and link for each day. When navigating through a column, JAWS reads the leftmost cell as a header cell; it then reads the current cell. For example, when navigating the month of May for the week beginning on Sunday, May 15, JAWS read: 15 18, 15 19, 15 20. Adding a header cell on the left side (e.g., Week 1) would improve navigation.

Without vision, there is no way to tell which links have content associated with them without opening each link. If one does choose a link with content, the page refreshes and the entire Contents frame is read again from the beginning. Moving to the "results" table will eventually let you read the entry, but that assumes you knew one was there to be read.

Navigating to Month or Year

If a reader tries to select a month or a year from the drop down menus, the browser automatically jumps to the first month or year selected. This is, therefore, an example of an inaccessible "Jump Menu" (a menu that automatically "jumps" to whatever is selected). Users must be able to select a given month then hit a "Go" button to activate the link. Also, a search engine that allowed users to enter a specific date would allow them to go to any day without using the Month table. The current Search menu allows a person to search for a date but will not allow one to search for content within a date entry. Unfortunately, the screen reader does not go to the results of the search but reverts back to the search form, where it reads the input again. The user has no way of knowing if anything was found in the search.

Other Issues

Icons used next to links to add an event, insert events, and so on, are not included within the link tag (<a>) and therefore exist merely for decoration. However, because they have descriptive alt-tags, JAWS reads everything twice. These graphics should either be incorporated within the link tag or should be given empty alt-tags.

Discussion Boards

It is very difficult to become oriented to the discussion board and to use it with a screen reader. Much of the structure of the page is problematic with too many elements on the page that must be read before the list of discussion messages, resulting in extra time and effort to access messages. We found that changing the default settings for the display of the discussions, including turning off the preview pane and left-side menu, greatly increased our success reading the messages with JAWS. Even after these changes were made, however, students will discover they cannot change the way messages are displayed. This is because the options to view messages (threaded, unthreaded, etc.) is another "jump menu."

Reading a Message

The best way to move through the messages is by using the Tab key. The column headers (which are not table headers <th> but links) will sort the content if the messages are viewed as "unthreaded." (This option is not available if "Threaded" is selected because there is no standard order of the messages.) Sorting by date can be very useful as the most recent messages will display at the top, preventing the reader from reading old messages before getting to the most recent (assuming they are looking at all the messages and not only the unread). Opening a message allows one to move to the previous message in the topic using the "Prev" or "Next" buttons. Finally, we found the option to "View the messages displayed below in a printable format" a nice way to get access to a screen reader-friendly view of all the messages in a particular discussion.

Creating a New Discussion Board Message

Before attempting this task, we changed our preferences as described above. Our first problem was finding the "Add Message" button. Unlike all the other options on the page (Display Options, Print View, Flag Messages, etc.), the "Add Message" option is a button not a link. Thus, one must navigate to the specific spot on the page where the button is located and the button does not show up in the list of links. Because the button shares space with a lengthy option toolbar, it takes a while to search through the many links and find the correct button.

The insert screen message opens as a new window. This is a straightforward form that is fairly well constructed. Students cannot use the HTML editor, however, as this is not accessible and impossible to navigate (it has three frames and we couldn't find a quick and easy way to get to the input box). It might also be helpful to put the HTML editor, spell check, and preview buttons after the message input box so one can quickly move from the subject to the message.

Submitting the message does not close the message window (similar to the calendar). Logically, we expected to be returned to the list of messages (which would now show the message we just posted, of course), but this is not what happened. Furthermore, a person would be lost because there is no way to know if the message submitted or how to get back to the list of messages.

E-mail

Getting to the e-mail section was easy if one used a links list (Ins-F7 in JAWS). Once in e-mail, the user needs to get to the Contents frame. The first button is a link to the address book. This is a simple form with check boxes, which can be tabbed through. There is no search feature, but the names are arranged alphabetically and can be selected by hitting the space bar. Students select the student(s) to whom the message will be sent, then return to the "To:" action button at the top of the list to automatically insert these names in the "To" box of the e-mail form. The simple two-frame format was also easy to navigate. However, the "Browse [for file]" button did not work for us in JAWS. Although the cursor tabs to the button, JAWS did not read anything and nothing happened when we hit Enter to activate the button.

General Issues and Comments

Throughout D2L we found many coding errors, which resulted in none of the pages we checked validating correctly in either HTML or CSS (cascading style sheets). All pages that we checked lacked a DOCTYPE. In addition alternative text attributes are frequently mistyped (alt=" instead of alt=""), and the use of frames is passé and complicates navigation. Many pages seem to be needlessly complicated (e.g., multiple nested tables in the widgets). Embedded style sheets are used for formatting, making site-wide updates tedious and difficult. Style sheets are not used for positioning. Other problems include:

JavaScript-Based Navigation

D2L relies on JavaScript to create and manage navigational structure, as well as to perform various tasks. JavaScript can cause errors with certain types of assistive technology. For instance, we attempted to navigate the course content using the WYNN 3.1 (Freedom Scientific, 2002; WYNN is used by students with reading and writing difficulties, such as learning disabilities) and received fatal computer errors whenever we tried to open a course content page (these errors which crashed both Carmen and WYNN itself).

Reliance on "Mystery Meat" Navigation

Complex symbol icons are frequently used to represent various tasks that users can activate. For example, there are nine icons at the top of the Contents frame. A person must tab to an icon and allow the alt-tag to display to understand the icon's function. In addition, some functions remain unclear, and others use similar icons (we consistently confused the "toggle menus" symbol with the "feedback" symbol). Vincent Flanders (2005) has labeled this type of navigation as "Mystery Meat Navigation," because one doesn't know what will happen after clicking on the icon.

Users may also have difficulty seeing the symbols (which do not increase in size with standard browser zoom), and may be unable to remember the function of different symbols.

Scalability

One frequent complaint from students is that text, including menus and help content, cannot be scaled to accommodate those with low vision or who use poor quality displays. Although D2L offers students some methods of increasing text size, text cannot be increased using the text size choices in Internet Explorer's View menu, which is the most common way of increasing text size for many IE users. The problem appears to be that D2L uses points to define text size, which prevents this feature from working. In addition, when text size is increased in Firefox, the primary menus in the Navigation frame become invisible or difficult to access because the Navigation frame does not resize as the text enlarges. Thus, any menus at the bottom of the Navigation frame disappear below the bottom of the frame.

Allowing for flexible frame heights and window widths would help insure that toolbars are always available. Alternately, turning on vertical scroll bars for all frames would allow users to scroll to see additional content. In our opinion, the preferred solution is to abandon frames altogether.

Conclusion

In general we find D2L minimally accessible to students using screen readers. Some problems can be easily solved (the alt-tag issue), but others (the HTML editor) seem intractable. Moreover, the use of frames complicates navigation and customization. To its credit, D2L is dedicated to fixing any problem. We hope that future releases of the product will show vast improvements.

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