



Anglia Ruskin  
University

University Centre for Learning and Teaching

Cambridge & Chelmsford

## Designing Accessible Courses in WebCT

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# **Designing Accessible Courses in WebCT**

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\*The glossary is designed to provide comprehensive technical guidance so that course designers can follow all of the recommendations contained in this booklet.

## **Introduction**

This booklet is designed to introduce teaching staff, designing courses using WebCT, to accessibility issues and to provide guidelines on how these issues can be addressed. In this context, the term 'accessibility' refers to the ability of all users to access and participate in a course, irrespective of any problems that may affect their interaction with any material or facilities available online. Such problems include various forms of sensory impairment and limited mobility.

In preparing this booklet, we have assumed that you already have enough knowledge of WebCT version 4.0 to initiate and build a course, and also have a basic understanding of the different file types that you wish to use in a course. The booklet focuses on WebCT because this is the preferred Virtual Learning Environment (VLE) used by Anglia Ruskin University, although many of the comments on accessible materials refer equally to other VLEs and to free-standing online materials.

Accessibility should be a fundamental issue in course design, and should never be thought of as something that can be added on later. In most cases, good accessible design will result in a course that will be easier for all students to use. The main part of this booklet has been kept brief so that its message will be easily available to all course designers in Anglia Ruskin University. Some technical aspects have been covered in greater detail in a glossary at the end of the booklet.

Glossary items are underlined in the text. These items should provide enough information for you to follow the recommendations in the booklet. If you still find that this is insufficient, you should contact C&ITS or your faculty learning technologist.

## **Main recommendations**

- Before designing your course, you should be aware of the needs of disabled students, and the potential problems that they may experience when using a WebCT course.
- During the design phase, you should consider the accessibility of the different WebCT tools and file formats that you are using, and include alternatives where necessary.
- After you have built your course, you should test it thoroughly.
- Before any students start to use your course, you should provide whatever training they need to be able to access the course easily.
- Where possible, and respecting confidentiality, contact any students on your course with known disabilities, and discuss any accessibility problems with them or their learning support assistant.
- If you need help, seek advice from C&ITS, Learning Support Services, the East Anglia Regional Access Centre, or your faculty learning technologist.

## **What is meant by disability?**

The term disability covers a very wide range of circumstances, including visual, auditory, speech and mobility problems; cognitive, perceptual and learning disorders, and so-called 'hidden' or 'unseen' disabilities such as diabetes and asthma. With this diversity, it is clear that disabled students can experience a very wide range of problems with e-learning provision. Equally clearly, no single approach to e-learning is going to satisfy the requirements of all students.

There are about 120,000 disabled students in UK higher education, together accounting for 5.5% of the total student population (data for 2003-04, National Disability Team). Dyslexic students form the largest group (2.2% of total UK students), followed by those with 'unseen' disabilities (1.1%).

## **How might disabled students be disadvantaged in e-learning?**

The online environment is different from many other forms of learning. Students are expected to interact with information on screen. This information is presented mostly in a visual form, and to a lesser extent via sound. Typically, the interaction requires the student to control the presentation of information, by selecting objects and by creating a pathway through a complex structure.

These requirements raise obvious problems for some groups of disabled students. The most obvious of these, and the one that is the commonest focus of attention, is the case where visual impairment or visualisation problems make it difficult to deal with visual information on screen. Correspondingly, students with hearing impairment will experience difficulties with audio presentation.

Even where alternative provision can be made to meet these challenges, navigation through the e-learning environment presents additional problems for some groups of disabled students. Most of us navigate by clicking on hyperlinks, whether these are text links or buttons. This is difficult for many disabled students, including those with visual impairment, those with motor difficulties, and those with cognitive problems.

As well as practical problems, disabled students may feel that online delivery isolates them from support that they may receive on campus. This perception may be more imagined than real in blended learning, where e-learning supports more conventional, campus-based teaching. However, it can be a genuine and significant problem for distance learning students.

### **How do disabled students benefit from e-learning?**

Despite the problems outlined above, e-learning offers some positive benefits to disabled students. These include:

- The opportunity to work at a time and pace to suit the student.
- The ability to control the way that information is presented and interpreted.
- Ease of integration with assistive technologies.
- The opportunity to undertake work in a familiar and consistent environment.

These topics are explored in depth in the report of the ALERT project (2005), which offers recommendations for maximizing the advantages of virtual learning environments for different groups.

## **Statutory and institutional obligations**

Provision for disabled students at Anglia Ruskin is covered by UK legislation. Currently, the main legislation governing accessibility within e-learning is the Special Educational Needs and Disability Act (SENDA) 2003. This requires higher education institutions *'to make reasonable adjustments to accommodate the needs of disabled students'*. Uncertainty arises because there is no definition of what is *'reasonable adjustment'*. Second, there is an anticipatory aspect of SENDA which means that institutions need to *anticipate* that they may have disabled students on their courses, and to already be able to meet their needs.

WebCT originates from the USA, and thus its accessibility standards have been driven predominantly by legislation within that country. This is embodied in the Americans with Disabilities Act/US Rehabilitation Act (Section 508), usually referred to simply as 'Section 508'.

For Web sites, there are international generic accessibility guidelines provided by the World Wide Web Consortium (W3C) Web Accessibility Initiative (WAI). They have three levels of accessibility guidance, known as Priorities 1, 2 and 3. Priority 1 is a minimum level that removes the fundamental barriers to accessing web materials, but still may exclude many disabled students. Priority 3 ensures that web-based material is accessible to the great majority of disabled users. Anglia Ruskin University aims to have all web-based material conforming to Priority 2 (also designated 'AA' on the WatchFire 'Bobby' test site).

WebCT's statement of accessibility is as follows:

*WebCT's e-learning systems are World Wide Web Consortium (W3C) Priority 1 compliant and adhere to Section 508 of the Americans with Disabilities Act. (source: WebCT Web site, November 2005)*

Although it is acknowledged that the WAI guidelines do not take into account the specific requirements of web-based e-learning environments of VLEs, it is fair to deduce from the above that there will be some students who will find WebCT inaccessible.

Independent reviews have confirmed a lack of accessibility within several VLEs. For example, a review by Dunn (2003) found *'... low levels of accessibility in VLEs...the accessibility barriers were within the VLE software itself and within the content'*.

Where does this leave teaching staff at Anglia Ruskin? Though the governors of the institution are accountable under UK legislation, all staff have a duty to assist their institution in complying with the law. This means making 'reasonable adjustments' to their teaching practice and materials to ensure that disabled students can participate in the learning environment. Furthermore, because of the 'anticipatory' aspect of SENDA, teaching staff need to prepare their materials with accessibility awareness from the start. To summarise, teaching staff need to consider both *how* they use WebCT, and the *content* they put in from the moment they start using it as a teaching tool.

## Hardware and software solutions

### Web browsers

A WebCT course is very much like a complex Web site, and is used within a web browser. Most users will have access to one of the several graphical web browsers such as Internet Explorer, Netscape, Mozilla or Firefox. Modern browsers offer several facilities to improve accessibility for disabled users.

Whilst the majority of current browsers display graphic content, there are some that only display text (including any links and descriptions for images). The Lynx browser is an example of a text-only browser. Some users may have specific reasons for using a text-only browser, so your online course will need to work effectively if the user does not have access to graphics.

### Assistive technologies

For some forms of disability, assistive technology exists that allows users to interface with digital information and the online environment. The user technologies cover three main areas of functionality:

- Visually impaired users may use screen magnification software to enlarge areas of the screen to make them easier to read. They may also use simpler approaches to magnification, such as using their browser to control text size in web documents.
- Blind users, those with severe visual impairment and some dyslexic users can use software that converts text, and some other digital information, into speech. Such software integrates with web browsers, and allows the user to navigate through the online environment.

- Users with motor difficulties may experience problems navigating in the online environment. Hardware and software solutions to some of these problems are available. Speech recognition software is an important component in this area.

## **Making the WebCT environment accessible**

The manufacturers of WebCT have made significant efforts to comply with accessibility standards, and provide extensive information on accessibility issues. However, it remains the case that parts of the WebCT environment either fail to meet the accessibility guidelines adopted by Anglia Ruskin, or that the design is such that whilst it may be technically accessible it is difficult to use in practice.

The main issues with WebCT are:

- The use of frames.
- Complex navigation on some pages.
- Inconsistency in the use of navigational styles.
- Use of small fonts in a way that users cannot control.
- Poor user control of display colours and fonts.
- Some tools which are inaccessible.

There are several actions that you can take that will improve the accessibility of your WebCT course. Often, these will help all of your students, not just those with disability. However, be aware that not all of the problems with WebCT are solved easily, and you may need to consider how best to support individual students by training and providing alternative options.

Please note that the issues and suggested solutions below refer to version 4 of WebCT Campus edition, the version currently in use at Anglia Ruskin.

### **Overall course design and structure**

As a course designer, you should follow these guidelines to ensure that you deliver a course that is as accessible as possible:

- Use a soft background colour and reduced contrast between text and background to favour dyslexic students. This will also be readable for most other users. Those students requiring a high contrast can still customize the way that their course is displayed in their browser.
- Use a template course. If you have access to a template WebCT course that has been created specifically for your faculty or department, this should have been tested thoroughly. However, you still need to follow these guidelines to make sure that your course remains accessible as you add new tools and content.
- Dispense with the Course Menu. This drop-down menu exists in a separate frame, and if it is open the navigation is read in full by screen-readers each time the user opens a new page. The Course Map is a better alternative.
- Provide a clear structure for your course, with distinctive and clear navigation. You can also use text blocks on organizer pages and content modules to explain what the page is about and what the different links do.
- Do not open new WebCT pages in separate windows. If you do so, you can confuse those who have problems with navigation, and expose screen-reader users to a further navigational jungle.
- Avoid the use of 'hybrid' courses. Some designers build courses that include free-standing Web sites within a WebCT course. Whilst these sites provide a greater level of designer control, and can be made accessible, they do not always integrate well with WebCT's navigation.

## **Individual tools**

The *Ultimate WebCT Handbook* (Rehberg, Ferguson and McQuillan, 2004) provides a comprehensive listing of accessibility issues for each of the tools in WebCT version 4. The following points summarise the main issues with more commonly used tools.

**Content modules** – Do not collapse topics in Content Modules. If you use the 'twisty' buttons in the Content Module to hide items in parts of the table of contents, you are setting up problems for students who experience difficulty navigating your course, especially users of screen-readers.

**Discussion forum** – Provide a tutorial for all students on how to use this tool if it is to be used as a learning tool. Give guidelines for good practice – e.g. clear subject titles, effective use of threads to organize postings. If the discussion forum plays a major role in a course, there may be a need to provide an alternative for some students, as navigating with a screen-reader is prohibitive – it can take over 40 clicks to get to the first posting for a topic.

**Calendar** – Designers are advised to use the weekly view of the calendar to reduce number of links for a screen-reader user to navigate.

**Quizzes** – Ensure that online quizzes do not disadvantage disabled students. They can stop the clock in timed quizzes, although it might be preferable to set separate, untimed versions of quizzes for selected students. Because of the format used in quizzes, some students may require additional training to use this form of online assessment. A paper-based alternative may be needed for some students.

**Chatroom** – The chatroom tool is used to provide 'synchronous' (or live) text communication. This presents a challenge to some students if they do not compose and type quickly. The interface itself is not accessible for all types of user. As a result, some students with disabilities are not able to access this tool in real time without assistance, so an alternative will be needed.

**Whiteboard** – The whiteboard tool in WebCT is a form of 'live' communication that enables users to exchange graphic material in real time. Like the chatroom, the whiteboard tool in WebCT is considered not to be accessible. Many disabled students will be excluded if this tool is used.

## External files

### General comments on file functionality

You should always have a clear idea of how you expect students to use the material that you are providing. Do your students need the interactivity that a web (HTML) document provides, or will they simply want to print a file to read it from start to finish?

The transfer to the online environment of printed course material can present problems to all users. Few of us find it easy to read lengthy text files on screen, especially where there are few cues that tell us where we are in a document when we are scrolling through it.

Some disabled students may experience these problems to a greater extent. In any case, you should be thinking how best to present your material so that it is easy to read on screen. The following features will make text files easier to use for all students:

- Sections that are short enough to avoid scrolling.
- Clear headings in standard styles, with a hierarchical numbering system.
- Lists of contents that hyperlink to sections (possible both in Word documents and in HTML files).

Users should be aware of the ways that they can control how non-HTML files are handled by their browser. It may be more useful to download a file and open it in another application, than to use WebCT tools or a plug-in within the browser.

## **HyperText Markup Language (HTML) documents**

HTML is the computer code in which most Web sites are written. There are several sites devoted to guidance on accessible HTML files, and some very amusing sites that show what happens when this guidance is not followed. Comprehensive guidance is provided in the glossary and elsewhere, and the following points summarise this advice:

- Use a standard, supported stylesheet to control the appearance of HTML documents.
- Prepare and edit HTML files using software that does not introduce spurious or inaccessible code.
- Avoid the use of tables for layout, and do not use frames.
- Keep navigation simple and consistent.
- Provide alternative formats for graphical and audio information.
- Check the accessibility of your document, using online accessibility testing software.

## **Microsoft Word documents and other text formats**

For text files that need to be read as a whole, Microsoft Word documents are accessible to screen-readers and offer better functionality than more robust alternatives such as Rich-Text Format (RTF). Formatting in text files needs to be considered in terms of readability for either on-screen use or as printed material (see guidelines above and glossary item).

## **Adobe Portable Document Format (PDF) files**

Adobe Portable Document Format (PDF) files are not considered accessible to screen-reader users, although they are used extensively because of their robustness in print.

## **Microsoft PowerPoint files**

WebCT will display native PowerPoint files, or you could elect first to convert the file to HTML. It is likely that direct conversion with PowerPoint will result in HTML code that is not fully compliant with accessibility standards. There are software packages that accomplish this transformation in a more accessible manner.

The facility to add notes to slides in PowerPoint is a valuable way to add extra educational content to slides. However, this will not be available to students if native-format slide sets are opened in WebCT, nor if the slide set has been saved as HTML. Instead, the slide set will need to be downloaded and viewed in PowerPoint. Notes are accessible to screen-readers.

## **Microsoft Excel files**

Spreadsheets written in Microsoft Excel can provide a useful interactive resource within a WebCT course. Because worksheets are designed to display large quantities of data, the default text size may be small. Normally, this should be increased before the spreadsheet is incorporated into your course.

## **Macromedia Flash animations**

Although recent versions of Macromedia Flash can be used to generate accessible content, it is likely that most Flash animations will not be accessible to all users. Any spoken narration on a Flash animation should also be provided either as text within the animation or as a separate transcript.

## **Graphics files**

WebCT supports various forms of graphics files, and images (diagrams and photographs) are commonly important elements of online learning material.

Clearly, students with some form of visual impairment will not be able to use images, and will need to have the information presented in an alternative format.

### **General comments on video files**

Obviously, video material will not be accessible to visually impaired users, although it is an effective medium for other users. Any narration should be included as subtitles, as well as being spoken, for access by those with hearing problems. If subtitles cannot be provided, the narration should be available as a text file, either on-screen or printable, with clear marker points to link it to the progression of the video. Printable transcripts are helpful for dyslexic users.

### **General comments on audio files**

Audio files are effective for those with visual impairment, but not for users with hearing problems. On-screen or printable transcripts are effective alternatives. As with video, printable transcripts are useful for dyslexic students.

## **Using third-party web resources**

If you are referring students to existing Web sites, you will have no control over the accessibility of other people's content. Also, you cannot submit these to accessibility testing programmes. You can assess the pages yourself, paying particular attention to any accessibility statement on the site, and whether it displays W3C compliance logos. If you understand the code, you can examine the HTML code on any site by using the 'View Source' option in your browser.

## Try it for yourself

For most of us, it is very difficult to imagine how students with disability experience an online course, particularly if they use assistive technology so that we cannot 'see' the course in the way that they do. Obviously, if you have an opportunity to try out this type of technology for yourself, or to work with an experienced user, it is very worthwhile. There are also several Web sites that provide further useful information, including demonstrations of how web pages appear to colour-blind or dyslexic users.

Navigation is a crucial issue. Whilst most of us will use a mouse to select an item anywhere on the screen and open a link, this is not an option for some users. Screen-readers and text-only browsers move through a page in a strictly defined sequence, starting at the top left-hand corner of the screen and working across the page in a series of rows. It is possible to download samples of this type of software and try it for yourself. As a simpler procedure, you can use your keyboard to navigate through your course. This will give you a good impression of how a screen-reader will find its way through the WebCT environment and your content.

You can test the accessibility of your course by following some simple instructions provided by TechDis:

- Change the browser setting to turn off the display of graphic images. Is the material still usable?
- Turn off the sound or unplug the speakers. Is the content still usable?
- Change the font size using browser settings. Is text still readable and understandable?
- Use the keyboard to navigate through the material. How many steps does it take to accomplish a given

operation? Can you do all operations using the tab key? Can you see the focus rectangle clearly?

- If you have access to a screen-reader or text-only browser, does the content make sense in this medium?

## **Supporting disabled students in e-learning**

The most useful thing that you can do for disabled students is to provide a course that will be just as usable for them as it is for their fellow students. All students should receive adequate training so that they can use their WebCT course easily. However, you may have to acknowledge that there will be areas where disabled students will encounter difficulties that affect their use of the online course. Here, you will have to provide additional help, either offering additional training to assist the student, or providing alternatives.

### **Student support and the East Anglia Regional Access Centre**

Disabled students who require assistance in studying are supported through the University's student support services. Where there is a need for assistive technologies, the students are assessed by the University's East Anglia Regional Access Centre (EARAC), who will then recommend products and training. The Access Centre and Student Support are aware of many of the issues associated with e-learning and accessibility.

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## Sources of information

**ALERT** This project provides a thorough review of the technical and pedagogical issues surrounding VLE use by disabled students. The report *Disabled students and VLEs* was published in July 2005 and can be found at:

<http://www.bournemouth.ac.uk/alert/guidelines.htm> (accessed 28 November, 2005)

**C&ITS** Specific queries about WebCT can be submitted to C&ITS via their job request page at:

<http://cits-support.apu.ac.uk/sw/webconnector/login.php>

**Dunn, S.** (2003) *Return to SENDA? Implementing accessibility for disabled students in virtual learning environments in UK further and higher education*. City University, London, p. 119  
Available at:

<http://www.saradunn.net/VLEreport/section06.html> (accessed 28 November, 2005)

**EARAC** Links to other Internet resources relevant to this booklet have been placed on the site of the East Anglia Regional Access Centre (EARAC). Visit:

[http://www.earac.org.uk/links\\_webdesign.phtml](http://www.earac.org.uk/links_webdesign.phtml)

**National Disability Team** Statistics for the numbers of disabled students in UK Higher Education are taken from:

[http://www.natdisteam.ac.uk/resources\\_statistics\\_oucourse.html](http://www.natdisteam.ac.uk/resources_statistics_oucourse.html) (accessed 28 November, 2005)

**TechDis** This body aims to be the leading educational advisory service, working across the UK, in the fields of accessibility and inclusion. Visit:

<http://www.techdis.ac.uk/> (accessed 28 November, 2005)

**Ultimate WebCT Handbook** The *Ultimate WebCT Handbook* by Stephen Rehberg, Donna Ferguson and Jeanne McQuillan can be obtained via:

<http://www.ultimatehandbooks.net>

**WebCT** The accessibility statement is taken from:

<http://www.webct.com/accessibility> (accessed 28 November, 2005)

## Glossary and 'how to' tips

The list below acts as both a glossary and a guide to carrying out actions mentioned in the text. Underlined items in the text are keyed below:

**Accessibility guidelines** The University has established guidelines for the accessibility of all online materials, including e-learning. See: Anglia Ruskin University: Web Guidelines – Accessibility  
<http://web.apu.ac.uk/anet/staff/guidelines/access.phtml>

**Accessibility standards** The accessibility guidelines are based on standards specified by the World Wide Web Corporation (W3C). Each of the three levels are based on a suite of features that must all be present in the online material for it to qualify (comply).

**Accessibility testing programmes** There are various automated software programmes that will test web pages for compliance with given accessibility standards. They cannot, however, detect all accessibility issues, such as inappropriate colour contrasts. See: World Wide Web Consortium: Evaluation and repair tools  
<http://www.w3.org/WAI/ER/existingtools.html#Evaluation>. Sites that are compliant may chose to display the appropriate W3C compliance logos.

**Alt tag** In HTML files, graphic objects should normally carry a text description, which is contained within the link tag. 'Alt' is an abbreviation for 'alternative text'. An alt tag added to an image link looks like this: `<img src = "logo.gif" alt = "Anglia Ruskin logo">`.

**Assistive technologies** Some disabled users may rely on either hardware or software to help them to use online materials. Software falls into four main categories:

- **Screen-reading** – Screen-reading programmes allow users with little or no sight to navigate around a computer system. It works by reading aloud the text, including 'alt' tags of links to facilitate navigation. Products include: Jaws and Dolphin Hal.
- **Magnification** – This software allows a visually impaired user to magnify the screen so that they can see the information displayed. As the magnification increases less and less of the desktop/programme is viewable on the

screen and by moving the view point the user can move around the desktop/programme. Products include: ZoomText and Dolphin Lunar.

- **Speech Recognition** – Speech recognition software allows the user to navigate and/or dictate by voice. There are various products on the market that provide varying levels of accuracy and navigation commands. Products include: Dragon Naturally Speaking, ViaVoice and iListen. WebCT has been tested with Dragon and it is effective for navigation, except that some button names are not visible without being moused over.
- **Text Reading** – These programmes are designed predominantly for dyslexic users. They convert text into speech and many have web capabilities allowing the user to point at text on a webpage and have it read back to them. They also include spelling and grammar checkers. Products include: TextHELP Read & Write, Claroread, Dolphin Tutor and Kurzweil.

**Background colour in WebCT** As a course designer, you can control the appearance of all of your WebCT pages either from within the course settings, or by adding a link to a stylesheet.

WebCT offers a series of pre-set formats, or you can select your own colour scheme. When in designer view, you should open the Control Panel, and then open the Course Settings menu. Click on the button 'Customize course colours'. In this menu, you can select either a pre-set option, or specify colour from a colour selector chart. The selector chart will also accept colours specified in hexadecimal notation, allowing you a wider range of choices than the 'paint box' palette.

As noted in the text, soft background colours favour most users, except those with visual impairment who require high contrast (see [high contrast option](#)). A suitable background colour is 'bone' (hex code ffffcc). You can elect to apply your chosen background colour to the entire course. Note that you can also use a similar process to change the colour of individual [organizer pages](#), but that once you have done this these page will never respond to a colour scheme applied to the entire course, except the user-specified [high contrast option](#).

Alternatively, you can insert a call to an external [stylesheet](#) within a text block on any [organizer page](#) or [content module](#). A [stylesheet](#) offers a wider range of choices, for instance controlling heading styles and the behaviour of [text links](#). However, the [stylesheet](#) call has to be incorporated into every

suitable page within a course. It will override every other form of formatting within the course, including the user-specifiable high-contrast colour scheme. The only way to override the stylesheet scheme is to use browser accessibility options.

**'Breadcrumb' navigation** At the top of each WebCT page is a line of links – 'breadcrumbs' – that traces the user's path from the course home page to the current page. Each link except the current page is 'clickable', allowing the user to backtrack through the course. There may be accessibility problems with this feature if large font sizes are specified by the user, because the frame containing the text links does not re-scale.

**Browser (web browser)** A (web) browser is a piece of computer software that displays Internet pages, usually written in code called HTML (HyperText Markup Language). Common browsers are Microsoft Internet Explorer, Netscape, Mozilla, Firefox and Opera. Not all browsers share the same features, and sometimes the appearance and behaviour of a web page will vary depending on the browser being used. Older versions of browsers may not support all of the features in a web page.

**Browser, displaying files versus downloading files** WebCT allows users to access various file types, including word processor documents, slide presentations, spreadsheets and animation. For non-HTML files, these can either be viewed in the browser, usually using a plug-in, or they can be downloaded and viewed with separate software. This software may be either the application in which they were created, or a viewer such as the Microsoft PowerPoint viewer for .ppt files or the Macromedia Flash viewer for .swf files. There may be advantages for disabled users in downloading files, so that they can be used in a more accessible environment. In Windows XP, linking to a non-HTML file in a browser automatically prompts a request to open the file or download (save) it. In older operating systems, it may be necessary to configure the browser to associate a particular file type with a suitable application.

**Browser, setting accessibility options** Modern browsers offer a range of settings that will over-ride the instructions within a web page. Most browsers offer the facility to alter the size of text displayed – this is usually a feature of the View drop-down menu on the top menu bar. Several browsers offer greater control, either through built-in features or uploaded 'plug-in' software. In Netscape version 7, Edit>Preferences will allow you to specify colours and fonts and make these

over-ride those of the web page. In Internet Explorer version 6, a similar facility is available through Tools>Internet Options>Advanced>Accessibility. Typing 'Accessibility' into the help search in your browser should show what facilities are provided. Such settings will override most internal settings in the course, including external stylesheets, but may not affect some WebCT tools such as the discussion forum and calendar.

**Browser, switching off graphic display** Most browsers offer the facility to switch off the display of graphics files – for instance using Tools>Internet Options>Advanced in Internet Explorer version 6. This will allow you to check whether a user who cannot use graphic images will still be able to follow the content of your course. The alt text of the images will remain visible.

**Buttons** see: Hyperlinks

**Changing font size** see: Browser, setting accessibility options

**Content module, in WebCT** The main way in which content is organized in WebCT is on a page that is built as a table of contents which link to files, and may also include quizzes. Heading can be used to annotate the table of contents. There are accessibility issues, including the use of 'twisty' buttons. Whilst earlier versions of WebCT could only have a single content module per course, version 4 allows several. It is helpful to all students to keep individual content modules relatively short and specific, and to leave sub-categories open. Several content modules can be referenced from a single organizer page.

**Control of text size and contrast by the user** see: Browser, setting accessibility options

**Course Map, in WebCT** The Course Map is generated automatically as a course is built, and comprises a 'clickable' list of all of the organizer pages, content modules and tools within the course. Its function is equivalent to the site map that is commonly present on Web sites. Note that for screen-reader users, the hierarchy of headings used in this listing will not be obvious. The Course Map is accessed from a text link at the right-hand end of the top frame in WebCT. It should be used in preference to the Course Menu.

**Course Menu, in WebCT** The Course Menu provides a means of navigating through a course from a central location, where

the designer can list all of the course components. Unfortunately, it is located in a separate frame that is read before the main frame where organizer pages and other tools are located. If the Course Menu frame is open, a screen-reader user will have to work through every link within it before gaining access to the main frame. This process will repeat each time a new page is opened, because the navigation focus returns to the top left-hand corner of the page.

**Downloading non-HTML files** see: Browser, displaying files versus downloading files

**Focus link, in stylesheet** A focus link should be included in a stylesheet to provide the same visual cues to users of keyboard navigation as for those using a mouse or other pointing device. Links should be specified in the order 'link', 'visited', 'hover', 'focus', 'active'.

**Focus rectangle** In most browsers, the selected link on a web page is highlighted by a rectangle. The user may be able to control the appearance of the rectangle. A stylesheet can also be used to make the focus even more obvious, say by using a contrasting background colour for the 'hover' and 'focus' states.

**Frames** These are a feature of the architecture of some web pages, and are used extensively in WebCT to divide the screen into different functional areas. Frames cause problems for users of screen-readers, because it is difficult for the user to control where they are on the screen (but see next item). In WebCT, a large amount of navigational links are contained in separate frames, and these may pose a significant obstacle to easy use of a page.

**Frames, how to identify frames when using the Jaws screen-reader** Because the WebCT environment is based on frames, it is useful for users of the Jaws screen-reader to know if they can move easily from frame to frame, rather than wade through a morass of navigation links on each new page. For users of recent versions of Jaws software, the keyboard characters Insert+F9 will display a list of frames, and the user can then select the frame that they wish to visit.

**High contrast option in WebCT** As noted above, the course designer can exert complete control over the colour scheme in a course. In contrast, the user can only make one choice within WebCT, and this is to select a high contrast option. This has a white background with dark text. The user needs to go to their

'myWebCT' page, either before they go into the course or by using the navigation link in the top frame. Selecting Preferences will open a new menu page. In the section marked Change Accessibility Preferences, select 'Use a high-contrast color scheme' and then click Update. The high-contrast option applies only to WebCT pages, and any other HTML documents or other file formats will not be affected. It is also over-ridden in the main frame by any local stylesheet applied to a WebCT page. The setting will continue for subsequent log-ins, and applies to all courses on which the user is registered.

**HTML files – general advice** When using HTML, avoid potential problems with screen-readers:

- Keep code simple.
- Do not use frames at all.
- Do not use tables for layout, and where data tables are used these should have row and column titles.
- Use external stylesheets to define the way that your file appears in the browser.
- Use heading styles to structure text.
- If links, such as images, are opened in separate windows, this should be stated explicitly. Where possible, the new window should contain a link to close the window and return to the previous page.
- If no alternative is offered for a printable document, test thoroughly the HTML document in print. Sometimes the printed output from web pages can be unpredictable.

**HTML files – graphics**

- Where graphics are included in an HTML document, they should have a descriptive text tag ('alt' tag) that informs the user of the content of the graphic. Alt tags can contain up to 1024 characters.
- Take care how graphics are placed in HTML files, especially so as to avoid breaking up the text at illogical places that makes it hard to read. Consider the use of 'thumbnail' images that link to larger versions that display full-screen in a separate window. Use the `<br clear = left>` tag after the image call to ensure that text fills in beneath the image, rather than butting up against it.
- If graphical elements are used solely for design purposes and carry no useful information, they should have null alt tags (`alt = ""`) to ensure that the graphic will be ignored by a screen-reader.
- Items of clip-art that are often used simply to 'lighten' printed handouts really have little place in an on-screen

document, and only serve to distract the reader – they are best avoided.

- Avoid where possible fussy graphics, with large amounts of texture and shading.
- Do not use background images or tiling patterns as these affect the readability of text.
- Apart from logos with distinctive typography, do not present text as graphics. This ensures that the text is accessible to a screen-reader, and can be re-sized.

**HTML files – navigation** See also: [Hyperlink](#) and [Text link](#).

- Only use graphics for navigation where these are supported by alternate text ('alt' tag) that explains explicitly what the link does (i.e. more than just 'Click here' or a description of the image).
- Ensure that any graphic links are obvious, rather than using 'cryptic' links that are difficult to identify.
- Use navigation styles that are consistent from page to page (location, type and behaviour of link).
- Give links clearly identifiable states to indicate their behaviour, so that the user can distinguish the active link.
- Where possible, indicate a separate state for previously visited links.
- Provide a 'focus' link so that users who use [keyboard navigation](#) also see [text links](#) highlighted.
- Ensure that there is sufficient space between navigation elements on a page. If you have more than one link on a line, you will need to use special characters, such as [ ] or | as separators for your code to conform to accessibility standards.

**HTML files – spurious code** The facility in Microsoft Word to 'save as Web Page' from a word processor document produces an HTML file that includes unnecessary code that makes the document inaccessible. The CourseGenie plug-in for Word will generate acceptable HTML from word processor documents.

Because of this, you should never edit an existing HTML document in Microsoft Word. Always use either the HTML editor in WebCT, a text editor such as Microsoft WordPad (save as a text-only file with an explicit .htm or .html extension), or a web authoring software package such as Macromedia Dreamweaver.

**Hyperlinks** Several file types allow the user to move to specific locations within the file or to open a separate file. These are 'hyperlinks' (sometimes just 'links'). For instance, in

Microsoft Word documents, the items in a contents list will link directly to the corresponding headings. In HTML files, hyperlinks are tags that are attached either to graphic objects (often designed to mimic 'buttons') or to pieces of text (see [Text links](#) below).

**Javascript** This is a computer language that is employed to provide increased capabilities in web pages. Strict accessibility standards indicate that any functionality that is controlled by Javascript should be duplicated by a non-Javascript alternative. Pages that make extensive use of Javascript might not be accessible.

**Keyboard navigation** Keyboard presses can be used to navigate around most web pages, including WebCT pages and tools. The tab key will move you to the next link, and shift+tab will move you one link back. Some tools in WebCT, such as the quiz tool, also use the 'arrow' keys for navigation.

**List, in HTML** A list is a formal structure for ordering information in an HTML document, and its appearance can be determined using a [stylesheet](#). List items can be ordered by alphanumeric characters, or identified simply using 'bullet' symbols.

**'myWebCT' page** This is the name given to the opening page in WebCT, accessed immediately after logging in. It shows all of the courses on which the user is registered, and also offers various options and help areas. This is where any preferences, such as the [high-contrast option](#) are selected. The myWebCT page can also be accessed from anywhere in the course using a [text link](#) in the top frame. This will take the user out of the current course.

**Online quizzes and assessment** WebCT offers various options for automated assessment. The format used has known accessibility issues, and it is likely that many disabled students will encounter problems. In particular, keyboard navigation requires the use of arrow keys as well as the tab key. Allowance should be made for the problems if the tests are timed – see: [stop the clock in timed quizzes](#) – or an alternative format may need to be provided.

**Organizer pages, in WebCT** The structure of a WebCT course is based on a series of organizer pages, of which the home page is an example. Organizer pages carry a number of links to other tools, and can also contain [text blocks](#).

**Plug-in** Software may be added to a programme to provide additional functionality. Examples of plug-ins include software added to browsers to view non-HTML files such as word processor documents or animations. Many plug-ins can be downloaded free from Internet sites.

**Screen-reader** see: Assistive technologies

**Separate windows** Like frames, working in multiple browser windows causes navigational problems for a range of assistive technologies. Within WebCT, the dialogue pages where links are set up usually ask whether the new page should open in the same window or in a separate window. As a rule, new windows should only be opened when referring to an external site, or when there is a good reason for having two windows open simultaneously.

When a new window is opened, it should be clear to the user that this has happened, and what needs to be done to return to the original page. Sometimes WebCT may cause new windows to open with links in normal HTML documents. These can be forced to open in the same window using the 'target' code, as in this example: `<a href = "filename.html" target = "_self">Call filename.html</a>`

**Speech recognition software** see: Assistive technologies

**Spurious code** see: HTML files, spurious code

**Stop the clock in timed quizzes in WebCT** Where disabled students are likely to experience difficulties with online quizzes, they need to be allowed more time to complete than other users. Disabled students can switch off the timing of quizzes. The user needs to go to their 'myWebCT' page, either before they go into the course or by using the navigation link in the top frame. Selecting Preferences will open a new menu page. In the section marked Change Accessibility Preferences, select 'Use a static clock when taking a quiz' and then click Update. Alternatively, you as a designer can set a separate version of the quiz and restrict access to your disabled students.

**Stylesheets** The way that a browser displays an HTML page, including a WebCT page, is controlled by code that determines things like text size and colour. Commonly, these instructions are collected into a separate file, called an external stylesheet. A common stylesheet can be applied to several HTML files. A

call to a stylesheet can also be placed within any WebCT text block. This instruction will over-ride any WebCT formatting, but will apply only to that page.

**Tables, in HTML files** These are designed to contain data or similar information, as they would in a printed document. However, some web designers use tables for layout, with the table grid being used to place objects in exact positions relative to each other. Screen-readers and text-only browsers will not display the table contents in the logical sequence in which they appear on screen. For accessibility reasons, the use of tables should be restricted to data presentation, with properly labelled columns and rows.

**Template course** When a new WebCT course is supplied, a copy of an 'empty' course without content or students can be uploaded into it. This empty course can be designed to offer a range of generic facilities, which should include design features that favour disabled students.

**Text blocks** An organizer page or content module in WebCT can contain one or more text areas, called text blocks. These can be located either above or below the links on the page. Text areas can contain HTML references to graphic images, and this is a preferable way to include a banner image because the image can be given a meaningful HTML description using the 'alt' tag. The text block can also be used to control the appearance of the page, by including a stylesheet or a call to an external stylesheet.

**Text files, formatting** The following guidelines are important for text presentation, whether for on-screen use or as printed material.

- Present text in suitable fonts. Use fonts such as the Helvetica-Arial family, Verdana, Comic-Sans and other sans-serif fonts. These can be specified as alternate fonts in HTML documents.
- Text size in printable documents should be a reasonable compromise between readability and paper use – 12 point is probably an ideal, but users can re-size if they wish. Use proportionate rather than absolute font size in HTML documents.
- Do not use italic text.
- For body text, use left justification. Avoid centred and right justified text, and do not allow text to wrap around graphics.
- Use punctuation carefully and effectively. Close paragraphs and list items with suitable punctuation.

- Where possible, give users the opportunity to change the text- and background-colours to suit their needs.

**Text links** Navigation from one object to another in an HTML file is usually accomplished either with graphical 'buttons' or clickable sections of text. Both of these work in the same way, even though they appear to be different. Conventionally, text links are distinguished from ordinary text by colour and/or underline. Their different states (normal, active, visited, etc.) can be indicated by different text or background colours, changes in border styles. Font style and size should never be changed.

Although text links can be inserted anywhere in a block of text, this may cause problems where users are sent to another location whilst in the middle of reading a paragraph, and then have difficulty picking up the thread again. It is generally better to keep text links separate from other text. Where several such links occur together, they are best placed into a list. Ensure that there is adequate space between items in lists of text links.

**Turning off graphic display** see: Browser, switching off graphic display

**'Twisty' buttons** In many parts of WebCT, the user can collapse or expand lists. The expanded list shows the heading and all of the items at the next level down, whilst the collapsed list shows just the heading. Next to the heading is a small green triangle. This points down when the list is expanded, and to the right, at the heading, when the list is collapsed. Although these 'twisties' are a convenient way of hiding long lists (for instance in a discussion forum), they pose navigation problems for screen-reader users. The twisty has an HTML description, although this does not always indicate its state. The twisty acts as an HTML link. Clicking on it returns the navigation to the top of the page. So a screen-reader user expanding a list will suddenly find that they have been returned to the start of the page in which they were working. This means that they have to fight their way back through all of the navigation and content to return to where they were. It is certainly recommended that these lists be left expanded in content modules – if the list is too long, consider dividing your material between more than one content module.

**'View Source' option** For any HTML page, you can reveal the code that controls how content is displayed. If you right-click

anywhere in the page, a drop-down menu gives you the option to 'View source code', which will then be displayed in a new window. You can use this facility to check on the accessibility of external sites, if you are able to identify some of the 'danger signs', like the use of tables for layout or extensive Javascript effects.

**W3C compliance logos** Web sites or single HTML files that have been tested for accessibility may display one or more logos that indicate their compliance with standards. These may include W3C valid code logos (HTML, XHTML, CSS) and the Watchfire 'Bobby' validation ('A' corresponding to Priority 1, 'AA' for Priority 2 or 'AAA' for Priority 3). These logos are a useful guide to standards compliance for third-party sites that you might wish to use on your course, although there is no absolute way to ensure that the indicated standards have been achieved.

**Web browser** see: Browser