

# National Center on Accessible Information Technology in Education

Publication #8

**National Center on Accessible Information Technology in Education (AccessIT)**

**Regional Disability and Business Technical Assistance Centers**

**National Institute on Disability and Rehabilitation Research**

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## Accessibility of Electronic Tools & Features Used in Distance Learning

Information technology (IT) presents exciting, new opportunities for people with disabilities, especially those who have difficulty accessing printed information. However, technology developers and programmers who are unaware of accessibility issues can create barriers for people with disabilities. Websites that don't work with screen readers, software that can only be used by manipulating the mouse, uncaptioned video – these are just a few examples of IT that are not accessible to individuals with disabilities.

Information technology and assistive technology often have to work together to provide access for people with disabilities. For instance, a blind person uses a screen reader (an assistive technology) to read information on a website (an information technology). Or a person with a writing disability uses voice recognition software (an assistive technology) to dictate answers to an online quiz in a distance learning class (an information technology).



Technologies for distance learning are becoming more common. They are used by postsecondary and K-12 educational institutions, and by businesses and other organizations. And, as with other types of information technology, if people with disabilities are not considered in the design of a class or course, they can be inadvertently excluded.

The term "distance learning" encompasses many different instructional situations. The precursor to today's distance learning was the old fashioned correspondence course, delivered via print materials through the mail. Today, distance learning courses may be web-based only, or have a combination of web-based instruction, print materials, audio and video materials, and onsite instruction. Even a course taught on campus may have its course materials, grades and other supplementary



materials online. It is important to note that distance learning courses may also require in-person meetings, proctored exams and printed materials, and those components must also be accessible to students and instructors with disabilities. However, this article focuses on electronic tools used in online distance learning, and provides a brief overview of the tools that most commonly present accessibility challenges.

Online distance learning courses are made up of a collection of tools or components. Individual tools include calendars, assignment tools, tools for

viewing grades, tools for sharing work and peer review, synchronous (real-time) chat, testing and assessment tools, threaded discussion groups, whiteboards, and many others. Most educational institutions purchase distance learning courseware that integrates different instructional and administrative tools into interactive online learning environments. Numerous courseware packages are currently available and the number of choices keeps growing. Courseware packages differ in the level of accessibility built into them. In order for a course to be accessible to individuals with disabilities, all distance learning components and tools used in the course need to be accessible, that is, the web-based pieces need to follow good web accessibility practices, video needs to be captioned and described, and so on.

For more information on the accessibility of courseware see the AccessIT Knowledge Base article: *How do courseware products differ on accessibility?*  
<http://www.washington.edu/accessit/articles?63>

## Synchronous and Asynchronous

Interactions that occur during a distance learning course can be divided into two categories: synchronous and asynchronous. Synchronous communication occurs in real time, similar to an in-person conversation or a telephone call. Asynchronous communication has a time lag between individual communications. Email is one example of an asynchronous type of communication, and chat is an example



of a synchronous type of communication. Chat requires that those engaged in the communication be online at the same time, while exchanging email does not require all parties to compose and view messages

at the same time. Synchronous tools tend to have more accessibility problems, while asynchronous tools are typically completely accessible to users with disabilities.

## Threaded Discussion Groups and Email

Electronic communications such as threaded discussion groups, Usenet discussion groups, bulletin boards and email all fall into the category of asynchronous text-based resources, and are

typically accessible to users of AT. The asynchronous nature of these tools easily accommodates people who need more time to read and compose messages. These environments tend to work well with reading software used by people with reading disabilities, screen reading technology used by the blind, and word prediction or voice recognition programs used by people with writing disabilities.

## Chat

Text chat is a synchronous tool, which allows several users to communicate via typed text in real time. Users post messages and respond to other users' messages very quickly. There are two basic issues related to accessibility of chat applications. Fast-paced conversation and the need to track multiple simultaneous threads present problems for users with difficulties reading, composing, or typing under time constraints. And, confusing interfaces and inconsistent navigation can be difficult and frustrating for users with cognitive or mobility disabilities.

It's also important to note that good accessibility starts with good instructional design, and because of its speed, chat may not be the best tool from an instructional design standpoint. Many instructors find that student responses and exchanges are more thoughtful when they direct their students to use asynchronous tools (such as email or threaded discussion tools) because these tools provide more time for all students to read, compose, and type messages. As a first step, instructors should consider whether real-time communication is essential. If it isn't, it might be best from both an accessibility and an instructional point of view to use asynchronous communication tools. If synchronous communication is essential, then an accessible chat application should be used.

Chat applications that work with screen readers are likely to work as well for users of other assistive technology. Users of screen readers experience considerable difficulties when using chat programs. Screen readers typically are able to handle some HTML-based chat rooms, but the way in which new messages are displayed can be problematic. Most applications do not allow the user to control how and when new messages are displayed. Typically, the window refreshes automatically, displaying new messages as soon as they arrive, and making the environment very confusing for users of screen readers. In order for a chat program to be accessible, it must allow screen reader users to control the arrival of new messages.

Furthermore, many current chat rooms are web-based applications that use the Java programming language. This means that unless the chat interface was specifically designed to work with screen readers, the application will not be accessible to blind users. This may be changing relatively soon. Although the accessibility of chat tools included in major distance learning courseware packages continues to improve, it



is important for educational institutions to inquire whether the built-in chat application has been tested with users of screen readers, and if so, with what results.

For more information on the accessibility of text chat see the AccessIT Knowledge Base article: *Are chat rooms accessible to people with disabilities?* <http://www.washington.edu/accessit/articles?64>

## Whiteboards

Many courseware packages include a whiteboard tool. The purpose of the electronic whiteboard is the same as that of a blackboard or whiteboard in a brick-and-mortar school. Instructors and students write or draw on the board in order to share ideas and deliver instruction. Electronic whiteboards work as graphical chat tools. They allow multiple users to draw, paint, and share existing graphical files in real time. As you might suspect, an exclusively graphical workspace is not accessible to users of screen readers and may be difficult to use by individuals with low vision. Even the text tools available in these environments typically produce text in a way that cannot be accessed by screen readers.

Whiteboard tools also include many exclusively mouse-driven functions, which exclude people who cannot use a mouse. Clearly, students with certain disabilities cannot participate actively in whiteboard activities, either because they are unable to use the graphical tools or because they are unable to see the shared environment. This is very similar to the situation individuals with disabilities experience in regular classrooms.

Like the decision to use other types of chat applications, the instructor needs to decide how essential the real-time collaboration/instruction is to accomplishing instructional goals. If it is essential, distance learning participants can use the same strategies used in the regular classroom; that is, to consistently and meaningfully narrate what is being drawn or typed on the whiteboard. This requires considerable skill and discipline on the part of all participants. Distributing the information in accessible formats (for instance, as a word processing file with graphs/figures/pictures described) before the whiteboard session will make it easier for students with disabilities to participate. (This practice often makes it easier for students without disabilities who need more time to engage with the material before or after the real-time session to participate as well). At this time, the best way to accommodate users of screen readers and other AT is to avoid using whiteboard tools for delivering content that is essential and significant.

## Testing and Assessment

Assessment is a high-stakes process both for the student and the instructor. Online assessment is very important in distance learning because it is sometimes the only tool that instructors have to judge student performance. Great care must be taken to ensure that both the interface and the content are accessible to users with disabilities. In particular, graphics need to be described in a way that preserves their meaning and if the event is timed, the software application should allow the instructor to give additional time to selected students. (Currently, most courseware allows instructors to either set the same time limit for all students, or no time limit at all).

### A Word about Media on the Web

Media on the Web is often inaccessible, but the topic is too complex to cover in this brochure. For more information on the accessibility of multimedia on the Web see the AccessIT knowledge base article: *What is rich media and how can I learn more about its accessibility?* <http://www.washington.edu/accessit/articles?146>

## Accessible Electronic Formats for Handouts, Readings, and Other Materials

You may be surprised to learn that users of AT cannot open files, such as PowerPoint presentations or Microsoft Word documents, from within the courseware environment. They have to download and save files in order to use AT to access the content. It is therefore important for instructors to provide these files ahead of time. Additional accessibility barriers are presented when Portable Document Format (PDF) is used. Although it is technically possible to create a “tagged” PDF document that can be accessed by AT, many users and advocacy groups strongly recommend more universally accessible alternatives to PDF, such as text or HTML, for all web-delivered documents.



For more information on the accessibility of PDFs see the AccessIT Knowledge Base article: *Is PDF accessible?* <http://www.washington.edu/accessit/articles?2>



This publication is available in alternate formats upon request and is one of a series on accessible electronic and information technology in education published by the

**National Center on Accessible Information Technology in Education (AccessIT),**  
in collaboration with the  
**Regional Disability and Business Technical Assistance Centers,**  
projects funded by the  
**National Institute on Disability and Rehabilitation Research**

## Conclusion

The wide range of tools and applications included in a typical course make distance learning accessibility a complex topic. Instructors and course developers need to understand accessibility issues, and use only accessible tools.

Universities and other educational institutions should take accessibility into account when selecting distance learning applications, and require that software developers produce accessible products. Accessibility of distance learning has been steadily improving; some of the courseware available today has useful and well-functioning accessibility features built in. If enough schools express interest in accessibility features, developers will begin to treat accessibility as an important aspect of their products. Additionally, as more individual institutions or states adopt accessibility policies that cover distance learning, developers who do not attend to accessibility issues will be unable to sell their products in all markets. Most developers will choose to develop one accessible application or package rather than offer two versions, one with accessibility features and one without.

Creating accessible distance learning applications will take time. In the meantime, schools need to work with faculty and students to increase their understanding of accessibility issues, and to help them work around the accessibility problems in current courseware packages and other tools.

For more information on creating accessible web-based distance learning courses, see the AccessIT Knowledge Base article: *What considerations should be made in order to develop accessible web-based distance learning courses?*

<http://www.washington.edu/accessit/articles?173>

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