

# Accessibility *in* Action



## Universal Design for Learning — Postsecondary Settings

### Preview

Postsecondary students with disabilities often need accommodations to achieve. Universal Design for Learning (UDL) offers postsecondary faculty a means of providing students with necessary accommodations. This *Accessibility in Action* explores UDL and Assistive Technology (AT) and how AT tools can be used to implement UDL.

## Technology Tools for Implementing Universal Design for Learning in Postsecondary Settings

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There is a common misconception that Universal Design for Learning (UDL) and Assistive Technology (AT) are essentially the same thing. Although both AT and UDL are helpful to students with disabilities, they are two very different concepts. However, technology—and more specifically, AT—can help with the implementation of UDL in postsecondary classrooms. This *Accessibility in Action* discusses the difference between AT and UDL, how AT can be used to implement UDL, and some tools and strategies for using AT to help implement UDL.

## Universal Design for Learning Versus Assistive Technology

### What is AT?

AT is defined by the federal government as any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified or customized that is used to increase, maintain or improve the functional capabilities of individuals with disabilities (Technology-Related Assistance for Individuals

with Disabilities Act of 1988). It is often person-specific and is employed as a measure to improve a deficiency, as the definition states. In postsecondary settings, students are typically responsible for securing their own AT, often through the college or university office of student disability services.

Before approving its use, universities usually require documentation that the student has a specific difficulty that requires the use of AT and/or other accommodations. Thus, not all students with disabilities qualify for accommodations or for the use of AT. In addition, because AT typically is not used until the student has displayed a need due to a failure, the approach to using AT often is centered on a single student, or per student, basis.

### **What is UDL?**

The concept of UDL borrows from the concept of universal design in architecture; it calls for classrooms and lessons to be designed to fit as many users as possible. Because everyone learns differently, it follows that the classroom experience should be designed to best meet everyone's needs and learning styles. With UDL, classrooms and lessons should need little to no retrofitting to accommodate students with different needs (Silver, Bourke, & Strehorn, 1998).

Using UDL, instructors provide:

- Multiple means of representation.
- Multiple means of expression.
- Multiple means of engagement.

Multiple means of representation implies that information will be provided in multiple formats (e.g., lecture, video, hands-on) to meet the varied needs of students. Multiple means of expression implies that students will be able to display what they know in the most effective means for them (e.g., varied tests, essays, class presentation, etc.). And, if the students are provided with multiple means of representation and expression, multiple means of engagement are likely to occur as well. Multiple methods will be used to engage all students; for example, varying from the expert-centered model of instruction found in the lecture and providing students the opportunity for group work and discussions where they can learn from each other (Rose, Harbour, Johnston, Daley, & Abarbanell, 2006).

UDL and AT differ in that, where AT is more of a retrofitting approach that is applied on a per student basis, UDL is applied at the beginning of the class and is intended to benefit all students. If applied correctly, UDL can make less work for the instructor by removing the need for some accommodations (Burgstahler,

2005). In general, implementing AT is a reactive process, while implementing UDL is a proactive process. However, technology, including some AT tools, can be very helpful in implementing UDL at the postsecondary level.

### **General Technology and UDL Implementation**

Digital text and the Internet are two of the most powerful technology tools that can be used to help implement UDL in postsecondary classrooms. Digital text plays a significant role in implementing UDL because traditional books may:

- Be difficult to access for many students (students with visual, physical, or learning disabilities).
- Not be the preferred method of learning for some students (students who are audio learners).
- Not be the most convenient way for many students to access information.

Providing students with digital text can alleviate these problems by allowing students to access the text in the most beneficial way. For example, students who have difficulty seeing or processing text can manipulate digital text into a format that they can access (e.g., increase the font size, change the color, convert it to an audio file that can be read aloud, etc.).

Digital text can be used to implement UDL for the benefit of all



students. For example, many students who do not have disabilities are primarily auditory learners. Providing them with digital text allows them to use the audio capability to obtain information in their preferred learning style. The manipulation of digital text also can benefit students who do not have difficulties with standard text. Being able to convert digital text into an audio file means students can make the textbook portable, allowing them to use time riding a bus or walking to class to listen to information for class.

The use of the Internet can help with the implementation of UDL by providing a means to access digital text, facilitate communication, and provide tools that can help students access the curriculum. The Internet is the perfect vehicle for the delivery of digital text. Using a class website, instructors can post digital copies of articles or class readings that students can download in a digital format and access in the manner that best fits their needs or learning styles. Instructors must be careful to ensure that their class websites and posted materials are accessible, however, or students will not be able to realize the benefits of digital text. [For more information on this topic, see Stachowiak & Castellani, 2009.]

The Internet also can be used to facilitate communication. Most instructors communicate with their students via e-mail, and doing so has created a universally designed mode of communication. Through the use of e-mail or chat functions on a class website, students who are deaf and/or hard of hearing can communicate with the instructor just as every other student can. This removes the access barrier to communication within the class. Tools such as the chat function or e-mail also can be used to encourage discussion among students.

Using technology for discussion can serve as a means of engagement for some students who may not be comfortable discussing topics in class. This also can provide a means for students who are in different locations to engage in discussions. These opportunities for students to learn from each other provide both multiple means of representation (students are getting material from each other) and multiple means of engagement (students may be more interested in learning in groups when using technology), and tools implemented through the class website can help with implementation.

Instructors can find free tools on the Internet that will help students access the curriculum in the way that best meets their needs or

learning styles. They include tools to help students read digital text and convert digital text to audio files, advanced spell checking tools, and tools to help with studying and note taking.

## AT Tools Used to Implement UDL

Some of the most commonly requested accommodations in postsecondary settings include alternative forms of text, alternative assignments, extra time on written assignments or tests, and scribes to take notes or make copies of class notes. One of the goals of implementing UDL is limiting the number of accommodations requested. To this end, all students can benefit from technology that is implemented to help students with reading, writing, and studying difficulties. Following is a discussion of selected tools.

### **Text Readers**

Text readers are AT tools for students who have difficulty accessing printed text. They may be used by students with physical disabilities who cannot turn the pages of textbooks, students with visual impairments who cannot see the printed text, or students with learning disabilities who have difficulty deriving meaning from the text. Text readers take digital texts and read them out



loud for the user. Although text readers are typically considered AT, having this technology for your class or discussing with the class as a whole how text readers work, how students can use them, and where they can find them, can help in constructing a universally designed environment. Aside from the obvious help that text readers provide to students with disabilities, they also can provide help for students for whom English is not their first language and who may struggle reading English text. Students who consider themselves more auditory learners also can benefit. As previously discussed, in order to use text readers you, as the instructor, must provide students with digital text and ensure that it is accessible.

Most postsecondary institutions will have at least some copies of selected text reader programs, such as Kurzweil 3000 and Read and Write Gold. These programs have many other functions aside from the text reader component, and they can be expensive.

There also are several free text readers that instructors could suggest or provide links to on the class website. Examples of free text readers that students could use to read digital text include Natural Reader and ReadPlease. By creating or providing digital text for students, knowing how and where to access text

readers, and providing directions or access to these programs, instructors can create a universally designed environment and reduce the need for accommodations in the area of reading. The text box, “Examples of Free Text Readers,” offers examples of tools appropriate for use in postsecondary settings.

### **Text-to-Audio Conversion Tools**

As with the use of text readers, providing students with

or directing students to audio conversion tools also can help to create a universally designed environment. Audio conversion tools will take digital text and turn it into an MP3 or WAV file that can be played on a computer or MP3 player. This tool can help students with print disabilities much like the text reader can, but the implications for the rest of the class are even greater. By converting the digital text to an audio file, the text immediately becomes mobile. Students with

## **Examples of Free Text Readers**



### **Natural Reader** (<http://www.naturalreaders.com/>)

Natural Reader is a tool that can work with any text on the computer. To use the free version of Natural Reader, users copy and paste text into the main page window where it is highlighted as it is read aloud. Users also can use the miniboard to use Natural Reader directly in a document. When using Natural Reader directly in a document, users must select the text to be read. There is no highlighting as the text is read aloud. The options are fairly limited in the free version; MP3 conversion is not available, nor are the more natural sounding voices. Users do, however, have the opportunity to adjust the reading speed via a sliding bar.

### **ReadPlease** (<http://www.readplease.com/>)

ReadPlease is another free tool for reading text. To use ReadPlease, users must copy and paste text into the Read Please window from a Word document, PDF file, or website. From there, pressing “Play” reads the text, and each word is highlighted as it is read. ReadPlease will read in different languages if users download them. There are four voice options, none of which is very natural

sounding. Users can easily adjust the font size of text being read as well as the reading speed via slider bars in the ReadPlease window. There is no limit on the amount of time that ReadPlease can be used.

### **BrowseAloud** (<http://www.browsealoud.com>)

BrowseAloud is a download that allows users to read text on a Web page. When the cursor is pointed to the page, text is read aloud and highlighted for users to follow along. There also is an option that allows users to enlarge the text as it is read. Text also can be turned into an MP3 file. This is used primarily by people with low vision, those who have difficulty reading, or those who are learning English as a second language. The voices are fairly natural sounding, and files that are linked to the Web page (e.g., Word documents or PDFs) also can be read. The downside is that, in order to work, the product must be used on a website that is covered by a subscription to the program. Some universities, including the University of Iowa and George Mason University, have subscribed to this program. Instructors can link to the download of the text reader plug-in on their class websites.



print disabilities can listen to the text, but so can students without print disabilities—and students can listen to the text in many situations, such as riding the bus, walking across campus, or working out at the gym.

Text reader programs such as Kurzweil 3000 and Read and Write Gold contain text-to-audio conversion tools. Free programs also are available. Alerting students to these options at the beginning of class can make your text universally accessible to students when they feel like accessing it, and in whatever form they choose. The text box, “Examples of Free Text-to-Audio Conversion Tools,” offers examples of tools appropriate for use in postsecondary settings.

### Writing Tools

Many students with disabilities have difficulty writing, leading to the request for accommodations such as extra time on written assignments. Even then, however, the quality of the submitted work can be poor. Some common tools used for helping students with difficulty writing or organizing their thoughts actually can be used by all students to help organize and produce better written assignments. These tools include things such as enhanced spell checkers, word prediction programs, and concept mapping software. Enhanced spell

checkers (e.g., WordQ, Ghotit, or Ginger Software) provide better help for those with difficulty spelling than does the spell check option found in Microsoft Word. They have the added benefit of text-to-speech to read the material back to the user. These can be excellent tools for students with invisible disabilities such as dyslexia that cause them to struggle with reading and spelling. However, you do not have to be dyslexic to struggle with spelling, and an enhanced spell checker can help anyone.

Concept mapping tools allow students to organize their thoughts visually using a web-like map. They use pictures and graphics to help students understand the differences between main points and supporting points and see how they should be organized for writing. These programs often turn the map into a writing outline. Concept mapping tools are most commonly used by students with various learning disabilities who have difficulty organizing thoughts in a written form; however, the benefits to all

### Examples of Free Text-to-Audio Conversion Tools



#### VozMe (<http://vozme.com/>)

VozMe allows users to convert text to an MP3 file. Users copy the selected text onto the site, select a language and a voice, and click “Convert to MP3.” The more text copied, the longer it will take, but when conversion is complete, another window opens and an MP3 begins playing. This file can be downloaded to other tools, such as an MP3 player. The downside to this program is that the voices are not very appealing to listen to. There is a means to imbed this program into a class website so that users do not have to go between two sites to convert text. Adding this widget to a class website is an excellent example of UDL.

#### SpokenText (<http://spokentext.net/>)

SpokenText is a service that allows text files to be converted to audio files. Users can copy and paste text, but they also can have the program audio record documents, Web pages, and e-mails directly. The converted files are available in multiple formats, including an iPod-ready format. The voices used are fairly good. The catch is that only the 15-day

trial is free. In trial mode, the user is limited in the size of the file that can be converted to audio and the amount of time it will be available on the site before it is automatically deleted. This is worth trying, and if it works well, purchasing.

#### Yakitome (<http://www.yakitome.com/>)

Yakitome is a program that allows users to convert a text file to an audio format (MP3 or WAV). Users must create an ID and a password (this does not seem to have a time limit). To convert text to speech, users can either copy text or direct the conversion tool to a document, RSS feed, or e-mail. Users also can choose the language, the speed, and the voice. The voices used on this site are much better than any of the other free text-to-audio options. There also is an option to ensure proper pronunciation. Conversion time depends on the size of the document being converted and it does not seem as though there is a limit on storage size or time. On the negative side, the program does not seem to respond well to .docx files. The interface also seems a little awkward and could be confusing for some users.



students have prompted many colleges and universities to purchase and make this software (e.g., Inspiration) available for all students. Knowing whether your institution supports the use of such software and, if so, being able to direct your students to it can help lead to a more universally designed method of accessing written assignments.

Text readers also can be used in conjunction with writing tools to help students who have difficulty with writing, including students with learning disabilities who might otherwise request extra time on assignments. By using text readers, students can listen to how their writing sounds. This is often a better way to edit than by reading one's own paper again. Many students, not only those with learning disabilities, can potentially improve their writing through the use of writing tools. The text box, "Examples of Free Writing Tools," offers examples of tools appropriate for use in postsecondary settings.

### Note Taking Tools

One common approach for creating a universally designed classroom is to provide students with a class outline in advance as a guide for taking notes, and to provide a copy of the notes after the class. Many students with physical and/or learning disabilities have difficulty with the physical

act of taking notes, or they focus too much on the mechanical act of writing and miss many important points made by the instructor. In general, providing an outline or a means for guiding the note taking process and providing more notes for reference after the class frees up the students to focus on the lesson and to participate more actively. Students typically attempt to write everything posted on a chalkboard or PowerPoint slide, which can lead to missing or not fully understanding valuable information. Thus, providing outlines and class notes benefits the entire class.

Notes can be uploaded to a class website for use by all students.

The use of a \$200 AT tool, the Smart Pen, combined with the in-class strategy of assigning a different student to take notes each class period also is a good way to provide universally designed class notes that students can access via multiple methods (visual and auditory).

The Smart Pen is both a pen and a recording device. When used with the Smart Pen Dot Paper (the accompanying notebook), the Smart Pen can record a lecture or a lesson and link it to notes that are written in the Dot Paper notebook. After the class, the user can take the pen and tap on a note that he or she has written and have what was recorded at the time of the

### Examples of Free Writing Tools



#### Ghotit (<http://www.ghotit.com>)

This is a comprehensive, online spell checker that is more in-depth than typical spell checkers; it can be very helpful to those with difficulty spelling. Users type or copy text they have typed into the box on the Ghotit website and then click on "Check Spelling." Words that are spelled incorrectly are highlighted in red, while words that are suspected to be used incorrectly are highlighted in blue. When users right click on one of these words, a list of words that expands out to the definitions appears. If the correct word is there, it can be selected; if not, choosing the "No Suggestions Relevant" option provides another list of suggestions. A plug-in also can be downloaded that will allow all options to be read to users. Ghotit can be used in Word documents at no cost for 30 days. However,

there is a means for education institutions to obtain it for free.

#### Ginger Software (<http://www.gingersoftware.com/>)

Ginger Software is a free spell checking tool that helps correct spelling that often is overlooked by other spell checkers. Users type a sentence, then select the "Ginger" button on the top of the screen. Ginger analyzes the words in the context of the sentence and very accurately corrects the misspellings as well as misused words and homophones. This is one of the most accurate spell checkers available. As of August 2009, the option to have the corrections read back to users was not implemented, but it is supposed to be added soon. This program works directly in Microsoft Word.



written note played back out loud. This provides an auditory back up to the written notes as well as a way to listen to an expanded version of what the student wrote on paper. This can be used as an AT tool for students who have difficulty writing, requiring them to write only minimal notes to obtain the class information, or for students who have problems concentrating while taking notes. By taking only a few notes, they can capture the important information from the class. This is a preferred accommodation to simply providing an audio copy of the lecture, because it allows students to bookmark different pieces of the lecture. They can then listen again to the sections they do not understand or need help remembering.

An instructor only needs one Smart Pen to use this successfully as a UDL tool in class. To get everyone in the class involved, the instructor can assign a different student to take notes each class period, giving everyone in the class equal responsibility for the process. With the responsibility to take notes that everyone in the class will see, the student recording the notes is likely to take very good/comprehensive notes during that class period. As a disclaimer, students also should be expected to take their own notes; these notes will be an added reference. At the end of each class period, the instructor

### Example of Class Notes from the Smart Pen Posted Online



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Theories of Counseling and Human Development Across the Life span

There will be additional readings

A beginning is better get to know one theory and then you can think in eclecticism.

\* characteristics of a therapist ...  
therapist are intentional

Why is important recognize that as a therapist you have power, and why power is important?

What is transference and countertransference mean?

Who is responsible for establishing the goals?  
is a collaborative relation. Goals should be reasonable, achievable, starting simple, measurable, specific etc.  
As a therapist you should review the initial goals during the process to sure you are moving in the right direction.

In counseling you use values etc. As a therapist you should be aware of feelings. How those might be impact by diversity.

(As a therapist you can't forget limitations) of confidentiality

Issues faced by beginning counselors  
\* + humor (when is appropriate or not)

As the beginning is going to be all about you :-)

0:00 / 1:33:08

can upload a combined version of the written and recorded notes to the Livescribe (Smart Pen's parent company) website, and a link can be shared with each student. Students will see the notes as they were taken by their

fellow classmates. They can then press "Play" and listen to the recording from the beginning, or click on a particular note to hear the recording that coincides with the written note.



Note taking in this format provides every student with equal access to class notes that can be accessed however the student feels comfortable. Providing the audio copy of the notes helps alleviate the problem of different people having difficult-to-read handwriting. Providing notes in this manner can eliminate the need for students to request class notes, audio recordings, or scribes as accommodations. It also can eliminate the need for the instructor to create class notes for just one or two students. All students will benefit and retain more information; by taking fewer notes they can pay closer attention and participate more. They also will have access to more reference notes in their preferred format when studying.

## Conclusion

Even though many people use them interchangeably, AT and UDL are two different concepts. AT is a single, student-centered,

reactive adjustment, while UDL is a proactive approach to designing the classroom experience to benefit all students and to remove the need for most retrofitting. That being said, many AT tools can be used to help implement UDL in the postsecondary classroom. Although tools such as text readers, text-to-audio conversion tools, talking spell checkers, concept mapping software, and recording pens are typically used to assist students with disabilities, they also can be used by all students for different benefits.

Some of these tools, such as the Smart Pen, can be used directly in class to aid all students and reduce the need for accommodations. Others are available readily enough that making students aware of their capability and where they can be found can help all students, while also limiting the need for accommodations. This can go a long way toward implementing UDL in a classroom.

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