

INCREASE ONLINE STUDENT RETENTION WITH UNIVERSAL DESIGN FOR LEARNING

Thomas J. Tobin

Northeastern Illinois University

Adopting Universal Design for Learning (UDL) principles in order to create online course content allows higher education faculty members to reach out, not only to learners with disabilities, but also to learners who are increasingly using mobile devices to connect to campus and to each other. This article outlines 5 key strategies for creating and converting online course content to be more accessible to today's Web 2.0 learners. One challenge of creating content according to UDL principles is the large scope of a full-on UDL treatment. This article shares specific time-based milestones to help readers to work through the UDL process in a realistic, step-by-step fashion.

INTRODUCTION

Well-designed online courses keep students engaged with each other, with the professor, and with the material being covered. However, we have all seen online courses that are merely repositories of barely warmed-over materials originally designed to support face-to-face courses (those PowerPoint slides that replaced the overheads that replaced the mimeograph sheets), perhaps with some asynchronous discussion forums or autoscored quizzes thrown in.

Even when online courses are constructed “from scratch,” Hart (2012) identifies “quality of interactions and feedback” and “social con-

nectedness/presence” as key predictors for student persistence in online courses and “difficulty in accessing resources” and “lack of accessibility” as significant barriers to student persistence (pp. 32–36). When was the last time one of your online students reported being unable to gain access to your carefully crafted video lecture materials or narrated PowerPoint slide presentations?

The trend of online learners in higher education using a mobile device as their primary—or only—connection for class activities is also increasing (see Chen & Denoyelles, 2013, for a recent study). More and more students are time shifting, screen shifting, and place shifting their studies. Learners in our

• **Thomas J. Tobin**, Coordinator of Learning Technologies, Center for Teaching and Learning, Northeastern Illinois University, 5500 N St Louis Avenue, Library 312, Chicago, IL 60625-4699. E-mail: t-tobin@neiu.edu

online courses increasingly expect access to course materials, not only all of the time, but everywhere, and through narrower and narrower information “pipes.” For faculty members and those who support them, adopting the tenets of Universal Design for Learning (UDL) is an effective response to the challenge of creating and maintaining an enhanced connection with our students.

UDL is most often associated with the use of online technology to help extend learning opportunities to students with disabilities, though UDL allows us to do much more than merely accommodate student disabilities. UDL is an approach to the creation of learning experiences that incorporates multiple means of engaging with content and people, representing information, and expressing skills and knowledge.

UDL gives all individuals equal opportunities to learn and provides a blueprint for creating instructional goals, methods, materials, and assessments that work for everyone—not a single, one-size-fits-all solution, but rather flexible approaches that can be customized and adjusted for individual needs (Center for Applied Special Technology, 2013).

Why Isn't This Article About Accommodating Student Disabilities?

UDL is not just for students with disabilities. Various populations of learners have access issues. For example, online students who are time shifting their studies often experience bandwidth issues due to the expense of fast connections or the unreliability of Internet service in nontraditional study spaces (e.g., on the bus going home from work). Learners are also increasingly studying using nontraditional computer devices, such as mobile phones and tablet devices (Center for Assistive Technology and Environmental Access, 2013); this makes it challenging to consume content that requires specific software to open, such as PowerPoint presentations. Thousands of online students work their way through school and have family obligations, making produc-

tive use of formerly “free time” for studying an imperative (Tobin, 2013).

UDL sets up course materials so they are *designed* to be accessible to everyone. Sam Johnston is a research scientist at the Center for Applied Special Technology. She sums up the difference between design and accommodation: “We want a situation that is good for everybody.... Part of it is thinking about what has to happen at the level of design that makes accommodation less necessary” (personal communication, November 10, 2013). Thus, UDL occurs ahead of time and provides paths for everyone to use. Conversely, accommodations tend to happen reactively, in response to specific learner requests and needs, and tend to be more rushed and based on the least-needed effort to make the accommodation.

Adopting UDL as a framework for online courses helps greatly to retain students, as well. Today’s higher education students come from diverse backgrounds. We serve international students, learners across the socioeconomic spectrum, adult students, students with disabilities, and first-generation college students. By expanding access to learning materials, interactions, and engagement, UDL-designed courses make it more likely that any students who might otherwise encounter challenges—not just those with disabilities—will be successful and persist in our online courses. As Crosling, Thomas, and Heagney (2008) noted, such

adjustments to teaching practice improve the learning experiences and retention rates of students with a disability and those from other underrepresented groups such as non-English-speaking-background students as well. Inclusive adjustments to the intellectual environment work to improve all students’ experience of [the] university. (p. 24)

FIVE STRATEGIES FOR INCORPORATING UDL INTO YOUR ONLINE COURSES

Each of these strategies can be applied to existing course materials in less than an hour. They

rely on the principles of UDL to give learners different paths through course content, different ways to demonstrate their skills, and multiple means of staying engaged with the content, each other, and the instructor.

Start With Text

Build multiple paths based on a text foundation (Figure 1). This reveals gaps and needs. By scripting out what you want to say, demonstrate, and emphasize, you also reduce the amount of off-topic content produced when you create other versions like audio podcasts, screencasts, and video demos. Also, by starting with text, you can work against the fact that “Videos are not all that great for conveying information. A 5–10 minute video carries less

information than a chapter in a book ... be careful we are not watering down education to make students happy” (T. Zakrajsek, personal communication, June 23, 2014). Figure 1 shows a script outline for a presentation on evaluating online teaching. The next step for the creator of this outline will be to key out the exact words to be spoken for each element within the outline.

Create Alternatives

At first, create just two versions of content/materials then branch out. Select lecture materials on topics where students always have questions or always get the process mixed up. Create a text-only version and a video-demo version of just those materials. For example,

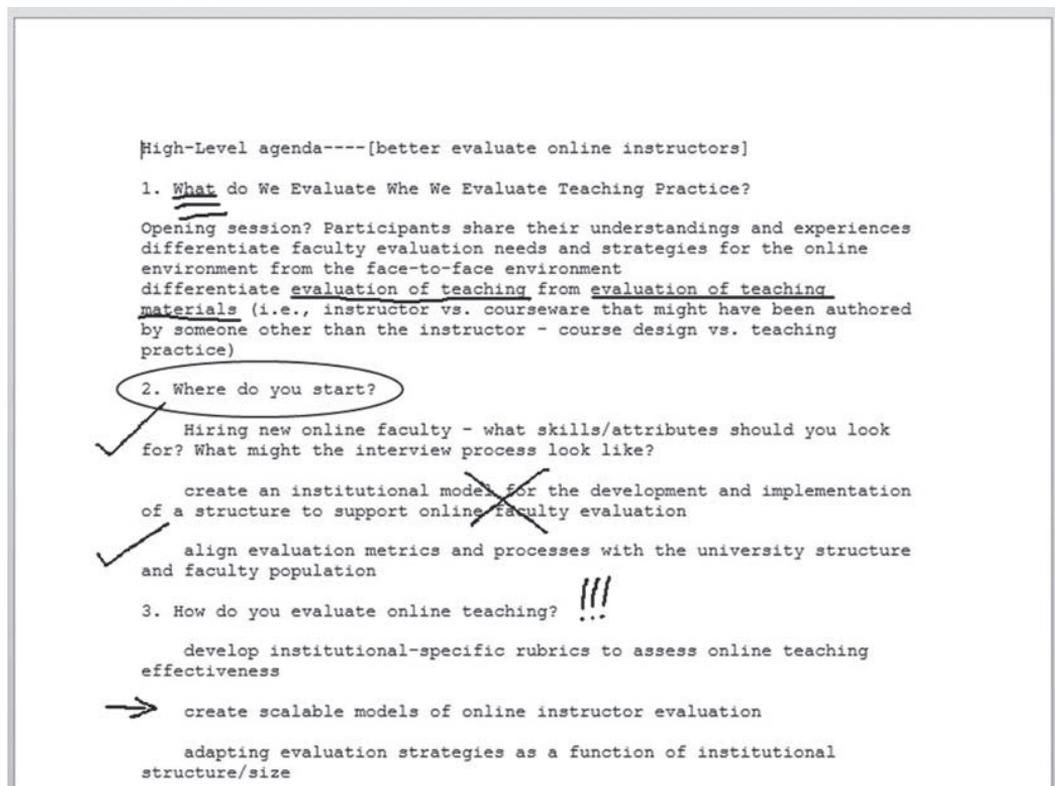


FIGURE 1
Start With Text, Such as a Script for a Course Interaction



FIGURE 2

Create Rich Media That can be Converted into Video, Audio, and/or Text-Only Resources
("Honeybee Research 005," © 2007, Jill Shockey, CC: BY-NC)

Figure 2 shows students assisting a professor in making a video for her online chemistry course. The video is only one stream of information that will be shared with the professor's online students. From the professor's notes on her computer, a text-only version will be created. From the video feed, still images will be captured that explain or elaborate on the text- and video-based processes the professor is demonstrating (and ALT metadata descriptions will be created for the still images). The video itself will be captioned.

Note that all of the alternative-format content being created expands access not only for students with disabilities, but for all online students. For example, an adult learner with family responsibilities can study after putting the children to bed by turning the sound off and

following along with the professor's video via the captions.

Let 'em Do It Their Way

Instructors set the objectives; students define the method and medium. Think of the last time you graded 30 five-page essays on the same topic. Blech! Allow students to select their preferred method of responding to the assignment criteria: write an essay, record a podcast, or create a video by putting their mobile-phone camera to good use. This makes assignments more engaging for students, and grading more engaging for faculty members, too. A caveat: if the assignment requires a specific format, stick to that. For instance, a busi-

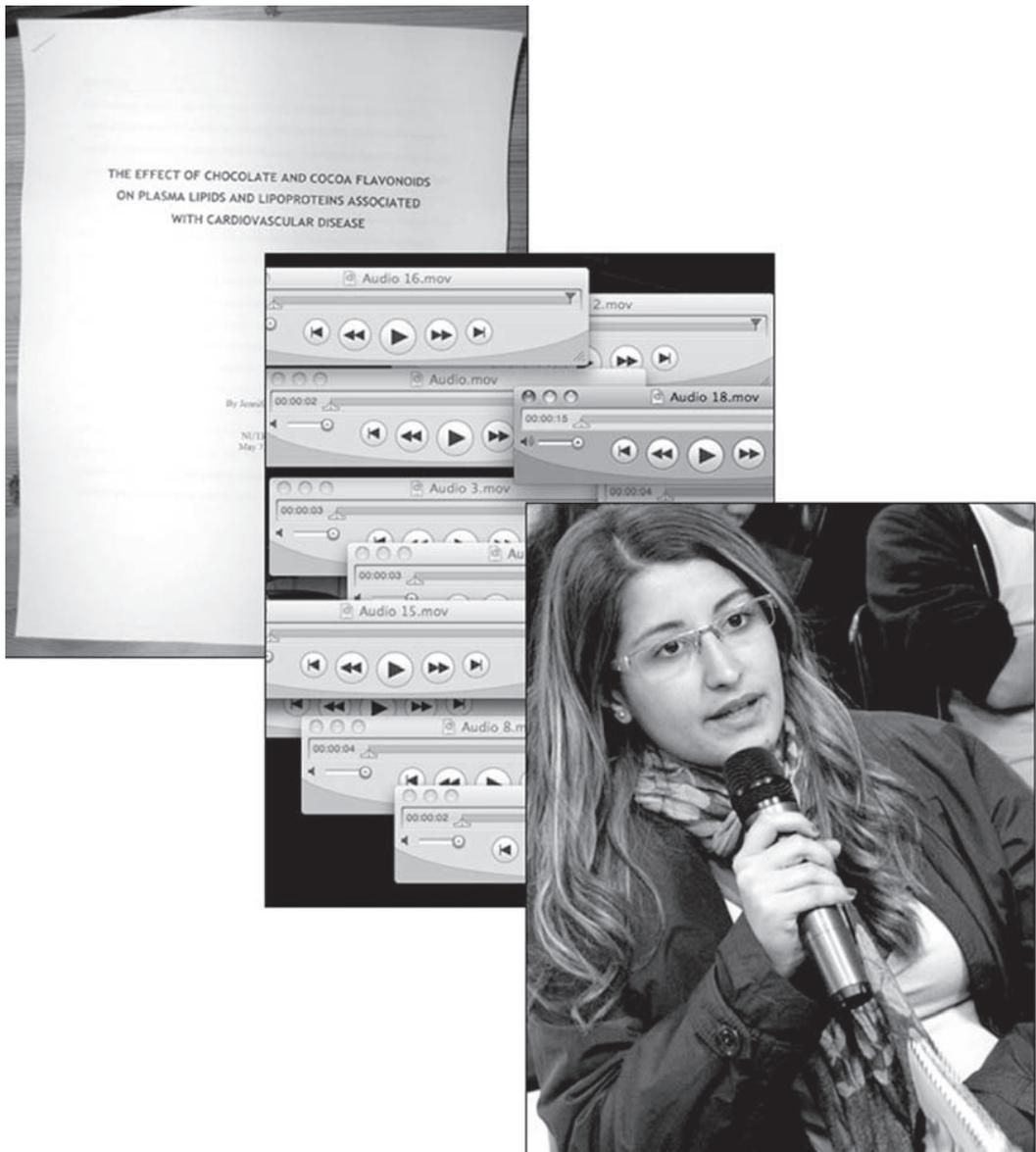


FIGURE 3

Design Learner Alternatives, Such as Writing an Essay, Recording an Audio Response, or Creating a Video

ness-memo assignment must be a written memo—no videos allowed. Figure 3 demonstrates that many course assignments need not be tied to a particular medium. The information transmitted by the student who wrote the traditional written essay could also be demon-

strated by recording an audio podcast or by the student “reporting” on the topic via video.

Course designers should strive to craft measurable behavior-based objectives for learner assignments. That way, so long as the items produced by students meet the objectives of

the assignment, they can be assessed according to the same criteria, no matter the medium in which they were created. Instructors should also create limitations for media-selective assignments, such as indicating the file formats that will be accepted for credit. This helps to avoid the possibility of students submitting files in rarely seen formats, and allows greater accessibility for students to see each other's work, while allowing the professor better access to student work, as well.

Go Step by Step

Break processes into units, steps, phases, and create separate resources. Look through your lecture notes and create segments that correspond to the logical breaks in the content. For example, make seven sequential text-based documents and create videos to go along with the two most involved or most important pieces. This allows learners to reconsume short pieces repeatedly, and saves you time when you update, add to, or reorder the content. Figure 4 shows how materials that correspond to a traditional 50-minute class period might be broken up into smaller pieces, with

discussion messages, knowledge-check self-quizzes, and other interactions sprinkled throughout. The result is a continuous whole that can be experienced a little bit at a time, repeated for reinforcement and study, or even experienced from multiple starting points and self-selected paths through the materials.

Such scaffolding is a good metaphor for this best practice for UDL: chunk up content into brief segments, ideally 5-minutes long or shorter. Each segment should cover one concept, or one step in a process—so long as it is a self-contained unit. The advantage for learners is that they can consume the short segments (especially true with video) more easily on mobile devices, especially in low-bandwidth situations where content must be downloaded rather than streamed. The advantage for faculty members is that updates or changes to content can be made by rerecording a short segment rather than, say, an entire hour's lecture content.

Set Content Free

Use tools that are accessible and easy for faculty and students to learn. A good example is creating a screen-capture video of a Power-



FIGURE 4

Break Course Concepts Into Their Component Actions
(Icons used with permission from Sothilingam, 2014)

Point slide show with your own voice-over, and then hosting the result on a file-streaming site like YouTube. Where before, students needed to have PowerPoint in order to get the file and use it, now all they need is an Internet browser. Students on phones and tablet devices can watch the video anywhere. Content is no longer tied to the clock, either: students can review and study at any time.

Figure 5 shows how device-connected people, regardless of where they are on the ability spectrum, are now using tools once thought of as the exclusive preserve of those with disabilities. A football fan, stuck in the “nosebleed” seats at a Dallas Cowboys game, follows the play-by-play by using the live captioning feature of the television broadcast of the game. There are also several free-to-use tools that allow faculty members and students to create multimedia, including Audacity and VoiceThread for audio content, and Jing, Screenr, and Screencast-o-matic for video and screen-capture materials.

Before leaving this strategy, we must discuss the most commonly used UDL strategy: captioning. For video resources, captions can help the vast majority of students. Thinking beyond students with disabilities, captions assist English-language learners, students studying in libraries and other “quiet, please” locations, and learners who process content better via text than via audio. For video content created by faculty members and instructional designers, we have an ethical (and often legal) imperative to provide an alternative format for the audio portion of the file. A separate transcript of the audio with time marks indicated is an acceptable, but not preferred way to meet this requirement.

Captions, although time-consuming to create, provide such broad benefits that they are well worth the investment of time. Some software, such as Camtasia, allows for automated captioning, but autocaption technology is still in its infancy, as any viewer of an autocaptioned YouTube clip can attest. Although this



FIGURE 5

A Football Fan Follows the On-field Action Using Closed-Caption Text
(© 2014 Softeq Development Corp, used with permission)

article cannot go into great detail about the best practices for captioning (see the Described and Captioned Media Program Captioning Key at <http://www.dcmp.org/captioningkey/> for a PDF quick guide), one change of current common practices can help all learners immensely. Most of us are familiar with the phrase “closed captioned.” This means that the captions do not automatically display when video is playing; users must select to display the caption text. The opposite is “open captioned” content, where viewers see the caption text whenever the video is playing and have no way to select captions to be on or off the screen. By creating video content that relies on open captioning, students who view the video material do not have to take an action to get captions to display. On mobile devices like tablets and phones, especially, closed-caption controls in media-player software may be small and challenging to use, difficult to get access to, or missing altogether. The take-away for creating video files is to caption them whenever possible (instead of providing a separate transcript), and to prefer open over closed captioning.

Now that you know these five general strategies, focus on a series of “next twenties”: what you can do in the next 20 minutes, 20 days, and 20 months to incorporate UDL into your online course environment.

NEXT TWENTIES

What You Can Do in the Next 20 Minutes

Most of these 20-minute tasks are planning tasks, but a few are actual applications of UDL that can be accomplished for a single document or file. These tasks average about 20 minutes—but do not be discouraged if some tasks take longer, depending on the length, complexity, and number of items involved.

First, consider the characteristics of all of the potential students who take your course. Based on your experience teaching the course, remember the age ranges, experience levels, ability profiles, gender distribution, and com-

fort with technology that apply to your typical student population.

- Identify elements in your existing or planned course that are currently “single stream.” For example,
- Lecture notes might now be in text-only format.
- A course might rely only on PowerPoint presentations to deliver content.
- Video snippets created by the professor might currently be audio and visuals only (with no text alternative or captions).

Brainstorm expansions into different media, different methods, or different expressions. For example,

- Plan how you would record a voice-only podcast of your lecture content (or ask current students to record their own audio of a short piece of the lecture materials).
- Draft notes for recording a screencast video using your PowerPoint slides and voice-over.
- Type out a transcript of professor-created video content, or edit the captions produced by software (such as the autocaption feature in TechSmith’s Camtasia product).
- Apply style attributes (e.g., headings, titles, emphasis) to a Microsoft Word document so that it can be read by screen readers.
- Apply ALT metadata tags to describe visual information like still images, charts, and graphs.

What You Can Do in the Next 20 Days

In the next 20 days, you can accomplish some planning, based on your earlier brainstorming. Plan out two paths through the course: one media based, and one text based.

- Go through your course—or, even better, ask a current student to go through your course—by finding nothing but text-based files. Where would such a student find gaps or be confused about what to do next?

- Go through your course by finding nothing but audio and video files. Where would a student using only those resources find gaps or be confused about what to do next?
- Map out the two paths, and note which pieces of content that already exist in your online course (or course plan) can become “anchor points” for creating ways for students to move through the content.

Also note areas where students have choices in how they can respond to their experiences in the course:

- Offer different options for responding to assignments.
- Provide asynchronous ways for students to converse with each other and with you.
- If you’re comfortable with doing so, offer students one “self-defined” assignment, where you provide the criteria, and they provide (and perform) the assignment details.

Create “interest points” throughout the course where you will

- recruit interest (get students involved in the learning),
- help students to sustain their efforts (offer encouragement, draw connections between previous work and future learning), and
- help students to self-regulate (talk to them about time management, help with planning, and provide milestones so students can compare where they are against where most students are at that point).

Also in the next 20 days, start watching how others have been successful and plan your own path. Complete the *UDL Guidelines Educator Worksheet* (Center for Applied Special Technology, 2011) to identify areas of opportunity for incorporating universal design throughout the online course. Watch the University of Washington video on “Making Distance Learning Accessible to Everyone” (Burgstahler, 2011), and then fill out the *Equal*

Access: UDL Distance Learning Checklist (Burgstahler, 2012) for hybrid and online courses.

What You Can Do in the Next 20 Months

Collect completion and usage statistics about resources in your existing online course. Ask students to share their use cases about how, when, and where they interact with the content in your existing online course. Many institutions already ask students to rate their experiences of courses via an end-of-term student survey. A best practice for UDL is to ask students during the course about their interactions with the content. Build a midterm survey of your own that asks students to share their approach to course materials and the ease of using them. For example,

- What devices do they use to view and interact with the tools and content in the course?
- How much time do they spend learning how to use various elements of the course?
- What elements of the course gave students problems? Did any cause students not to use items?
- Were students unable to get to or use any parts of the course?

Answers to questions such as these allow you to follow the University of Washington’s DO-IT [Disabilities, Opportunities, Internetworking, and Technology] Center’s recommendation to map and build one alternative path through an existing online course, beyond the “text only” and “audio/video only” paths that already exist (Disabilities, Opportunities, Internetworking, and Technology, 2013).

Share the possible paths through the course with your current students, and ask for their feedback about which parts need multiplying soonest. Collect completion and usage statistics about the resources in your UDL-augmented online course, for a pre- and postchange analysis.

PROFESSIONAL RESOURCES

Along the way from 20 minutes to 20 days to 20 months, higher education faculty members and staffers can reach out and consult with many people and resources to learn more about specific aspects of UDL, especially as they relate to making connections with online learners in order to keep them on track, in class, and motivated to achieve:

- Association of Higher Education and Disability: <https://www.ahead.org/>. This is an umbrella advocacy group that can put faculty members and staff in touch with local and national experts and resources.
- Boston College: <http://www.bc.edu/offices/help/comm-collab/webdev.html>

- Boston College has an in-house seminar entitled “Introduction to Web Accessibility for Content Developers.” Although it is designed only for Boston College staff, the creators are willing to share their expertise and content, on request (Charleson & Sadecki, 2012).
- Center for Applied Special Technology: <http://udloncampus.cast.org/>.
- One-stop web resource for learning about universal design for learning. Updated in mid-2014 with new content specifically for higher education applications of UDL.
- CollegeSTAR [Supporting Transition, Access, and Retention]: <http://www.collegestar.org>
- North Carolina college consortium formed to implement strategies to reach out to “stu-



**NEIU Center for Teaching and Learning
Universal Design for Learning MENU***

Library 312, Call (773) 442-4467 for details & delivery
<http://www.neiu.edu/~ctl/>



REPRESENTING INFORMATION
(choose 4 per semester)

	Min	Max
1. Make an Alt-Text Version	30m	2.0h
2. Give Background Knowledge	15m	1.0h
3. Break Content into Chunks	10m	30m
4. Create Text Version First	1.0h	3.5h
5. Find Multi-Use Library Items	5m	15m
6. Get or Make an E-Text	20m	2.5h
7. Highlight Patterns/Relations	15m	1.0h
8. Select One Item to Outline	20m	45m
9. Clarify Vocabulary & Symbols	10m	25m
10. ↗ Caption a Video	2.0h	4.5h
11. ↗ Guide Information Processing	1.0h	1.5h
12. ↗ Let Students Customize View	15m	30m
13. ↗ Turn PowerPoint into Video	30m	3.0h
14. ↗ Screencast a Process	5m	15m

DEMONSTRATING SKILLS
(choose 1 per semester)

	Min	Max
15. 1 Assignment is Audio/Video	10m	20m
16. Vary Navigation Paths	1.0h	3.5h
17. Many Tool Options for Work	5m	15m
18. Explore 1 "Outside" Free Tool	30m	2.5h
19. Build Skills Step by Step	20m	2.5h
20. Design Multimodal Assignment	30m	1.5h
21. Enhance 1 Discussion Board	30m	1.5h
22. Write 1 Task Outline for Work	15m	1.0h
23. Help Students Set Goals	45m	3.0h
24. ↗ Let Students Choose Format	10m	30m
25. ↗ Collect Student Work Samples	30m	1.0h
26. ↗ Help Students Plan the Work	1.0h	2.5h
27. ↗ Design Group Assignments	1.5h	4.0h
28. ↗ Show Monitoring Techniques	45m	1.5h

KEEPING STUDENTS ENGAGED
(choose 5 per semester)

	Min	Max
29. Write 1 Unit-Welcome E-mail Message	10m	25m
30. Show Content Relevance to Students	30m	3.0h
31. 1 Mid-Week Encouragement E-mail	10m	20m
32. Offer No-Consequence Practice	1.0h	1.5h
33. Tie Course Goals to Student Lives	15m	30m
34. Vary Demands & Resources of Work	3.5h	5.0h
35. Expect that Students Can do the Work	5m	15m
36. Allow Students to Reflect on Progress	5m	15m
37. Show How Work is Authentic	20m	45m
38. ↗ Share Coping Skills and Strategies	10m	30m
39. ↗ Create Self-Assessments Throughout	3.5h	5.0h
40. ↗ Foster Collaboration & Communication	1.0h	2.5h
41. ↗ Compose "Way to Go" Messages	20m	1.0h
42. ↗ Increase Mastery-Oriented Feedback	30m	3.0h



Fast, free delivery (of your online content)! Learn more:

- **CAST [Center for Applied Special Technology]:** udloncampus.cast.org. One-stop web resource about Universal Design for Learning.
- **EASI [Equal Access to Software and Information]:** easi.cc/clinic.htm. Free seminars and resources on accessibility concerns.
- **National Center on Universal Design for Learning:** www.udcenter.org. Resources for implementation in higher education.
- **San Francisco State University:** ctfd.sfsu.edu/udl. The Center for Teaching and Faculty Development has several guides to designing accessible multimedia that can be used in an online environment.
- **University of North Colorado:** www.unco.edu/ctl/UDL/UDLonline/. Stephanie Moore's online tutorial, *Presuming Competence by Design: A Tutorial for Systems, Environment, Curricular, and Materials Design in Learning Systems*, contains a unit on "Universal Design in My Online Course."



* We don't actually sell food—but we do help you to reach out to your students in ways that help them to succeed!

FIGURE 6

Universal Design for Learning “Chinese Menu,” Northeastern Illinois University
(see goo.gl/GouY8Y for the color PDF version)

dents who learn differently from what is most typical.”

- Equal Access to Software and Information: <http://easi.cc/clinic.htm>
- Resources and free seminars on accessibility concerns.
- National Center on Universal Design for Learning: <http://www.udlcenter.org>
- General Resources for implementation in higher education, especially the *UDL Guidelines Worksheet* at <http://www.udlcenter.org/aboutudl/udlguidelines/downloads>
- San Francisco State University: <http://ctfd.sfsu.edu/udl>.
- The Center for Teaching and Faculty Development has several guides to designing accessible multimedia that can be used in an online environment.
- University of North Colorado: <http://www.unco.edu/cetl/UDL/UDLonline/>.
- Stephanie Moore’s online tutorial, *Presuming Competence by Design: A Tutorial for Systems, Environment, Curricular, and Materials Design in Learning Systems*, contains a unit on “Universal Design in My Online Course” (Moore, 2007).

In addition to these resources, I have created a “Chinese Menu” of UDL strategies for faculty members at my own institution. In addition to being an attention getter, the menu serves as a reference, providing estimates for how much effort each strategy takes, in order to guide online faculty members in deciding where to begin and how to implement UDL in their online courses (Figure 6). By working on only a few elements of the overall UDL approach at a time, you can keep all of your online learners more engaged, and help to ensure that they stay on track toward their learning goals.

REFERENCES

- Burgstahler, S. (2011). *Real connections: making distance learning accessible to everyone*. Video, 13:07. University of Washington DO-IT Center. Retrieved from <http://www.washington.edu/doit/Video/index.php?vid=22>
- Burgstahler, S. (2012). *Equal access: universal design of distance learning: a checklist*. University of Washington DO-IT Center. Retrieved from http://www.washington.edu/doit/Brochures/PDF/equal_access_udl.pdf
- Center for Applied Special Technology. (2011). UDL guidelines—Educator worksheet. *CAST UDL Online Modules*. Retrieved from <http://udlonline.cast.org/guidelines>
- Center for Applied Special Technology. (2013). *About UDL*. Retrieved from <http://cast.org/udl/index.html>
- Center for Applied Special Technology. (2014). *UDL on campus: Universal design for learning in higher education—A guide*. Retrieved from <http://udloncampus.cast.org/>
- Center for Assistive Technology and Environmental Access. (2013). *Fact sheets on accessible distance education*. Georgia Tech Research on Accessible Distance Education Project. Retrieved from <http://www.catea.gatech.edu/grade/coursedesign.php>
- Charlson, B., & Sadecki, M. (2012). *Introduction to web accessibility for content developers*. Retrieved from <http://www.bc.edu/content/bc/offices/its/projects/udl/initiative-and-schedule/informational-seminar.html>
- Chen, B., & Denoyelles, A. (2013). Exploring students’ mobile learning practices in higher education. *EDUCAUSE Review*, 48(5). Retrieved from <http://www.educause.edu/ero/article/exploring-students-mobile-learning-practices-higher-education>
- Crosling, G., Thomas, L., & Heagney, M. (2008). *Improving student retention in higher education: The role of teaching and learning*. New York, NY: Routledge.
- Disabilities, Opportunities, Internetworking, and Technology Center. (2013). *How can I get started in making my distance learning course accessible to all students?* University of Washington DO-IT Knowledge Base. Retrieved from <http://www.washington.edu/doit/articles?112>
- Hart, C. (2012). Factors associated with student persistence in an online program of study: A review of the literature. *Journal of Interactive Online Learning*, 11(1). Retrieved from <http://www.ncolr.org/jiol/issues/pdf/11.1.2.pdf>
- Moore, S. (2007). Universal design in my online course. *Presuming competence by design: A tutorial for systems, environment, curricular,*

- and materials design in learning systems*. Greeley, CO: National Center on Low-Incidence Disabilities, University of Northern Colorado. Retrieved from <http://www.unco.edu/cetl/UDL/UDLonline/index.html>
- Shockey, J. (2007). Honeybee research 005. Photograph. August 27. Retrieved from <https://www.flickr.com/photos/pennstatelive/4948083648/>
- Softeq, Inc. (2014). *Durateq stadium captioning*. Retrieved from <http://www.durateq.com/captioning.asp>
- Sothilingam, N. (2014). *Woothemes ultimate icon set*. Retrieved from <https://www.iconfinder.com/iconsets/woothemes>
- Tobin, T. (2013, December 1). Universal design in online courses: beyond disabilities. *Online Classroom*, 1-3. Retrieved from <http://www.magnapubs.com/newsletter/online-classroom/story/6783/>

Copyright of Quarterly Review of Distance Education is the property of Information Age Publishing and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.