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Post-Secondary educators can increase educational reach with Universal Design for Learning

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Abstract

Meeting the needs of a variety of learners in college and university settings is of vital importance. By designing courses infused with Universal Design for Learning (UDL) principles, guidelines and checkpoints; professors and instructors create environments targeted toward meeting the educational needs of a wider variety of students. UDL works most effectively at the design stage. This paper aims to support learning environment design by presenting ten specific strategies for infusing UDL within post-secondary courses at the university level. These strategies will include: identifying barriers to learning, alternatives for participating during class time, effective alternative assessments based on construct relevance and UDL meta cognitive goals and transparency.

Introduction

College and university instructors have an increasingly diverse student population attending a wide variety of classes including first generation students, students in poverty and students with learning disabilities. With a large variety of learners entering post secondary settings the challenge of capturing the talents of this group is often a struggle (Rose, Harbour, Johnston, Kaley & Abarbanell (2006). Harnessing the instructional design power of Universal Design for Learning (UDL) is an instructional design lens that has the potential to provide access to rigorous curriculum (Meyer & Rose, 2005).

The purpose of this paper is to highlight a focus on planning and designing university curriculum to enable learning that is inclusive. This paper will provide a path to designing post-secondary courses using the UDL guidelines. Due to the increased online and blended course offerings, this paper addresses face-to-face, blended, and fully online learning environments. Relevant and concrete examples for using UDL in post-secondary and university course design and implementation will be given throughout the paper. This is not a complete compilation of ideas by any stretch. The content delivered here is to start a conversation, to begin ideas, and to give direction for providing continued access to rigorous content for all learners.

The term Universal Design for Learning refers to a scientifically valid framework for guiding educational practice that –

(A) provides flexibility in the ways information is presented, in the ways students respond or demonstrate knowledge and skills, and in the ways students are engaged; and
(B) reduces barriers in instruction, provides appropriate accommodations, supports, and challenges and
(C) maintains high achievement expectations for all students, including students with disabilities and students who are limited English proficient (20 U.S.C. 1003(24)).

Table 1 uses the CAST principles, guidelines and checkpoints by making the language actionable. That is, when using a framework of learning where student's are assumed to hold a vast amount of variability, this table provides specific objectives professors, instructors and course designers can practice to create access to rigorous curriculum for a wider student assembly.

Table 1. Actionable UDL

Provide multiple means of engagement to encourage purposeful, motivated learners	**Provide multiple means of representation to encourage resourceful, knowledgeable learners**	**Provide multiple means of action and expression to encourage strategic, goal-directed learners**
Provide options for recruiting interest by - Optimizing individual choice and autonomy - Optimizing relevance, value and authenticity - Minimizing threats and distractions	Providing options for perception by - Offering ways of customizing the display of information - Offering alternatives for auditory information - Offering alternatives for visual information	Providing options for physical action by - Varying the method for response and navigation - Optimizing access to tools and assistive technologies
Provide options for sustaining effort and	Provide options for language, mathematical	Provide options for expression and

persistence by - Heightening salience of goals and objectives - Varying demands and resources to optimize challenge - Fostering collaboration and community - Increasing mastery-oriented feedback	expressions and symbols by - Clarifying vocabulary and symbols - Clarifying syntax and structure - Supporting decoding of text, mathematical notation, and symbols - Promoting understanding across languages - Illustrating through multiple media	communication by - Using multiple media for communication - Using multiple tools for construction and composition - Building fluencies with graduated levels of support for practice and performance
Providing options for self-reflection by - Promoting expectations and beliefs that optimize motivation - Facilitating personal coping skills and strategies - Developing self-assessment and reflection	Provide options for comprehension by - Activating or supplying background knowledge - Highlighting patterns, critical features, big ideas, and relationships - Guiding information processing, visualization, and manipulation - Maximizing transfer and generalization	Provide options for executive functions by -Guiding appropriate goal-setting - Supporting planning and strategy development - Facilitating managing information and resources - Enhancing capacity for monitoring progress

Path #1: Identify Barriers

Inherent in all learning environments are barriers. These barriers can be unique to individual settings, students, or a product of the technology. Instructors can begin by taking specific inventory of the physical environment and notice the all too often barriers provided in many classrooms. From the overhead lighting that reduces most humans to one-dimensional versions of themselves, to the desks that were not built to accommodate laptops or power up any devise. What can be done to overcome these barriers? Advocating for a change of classroom might work. Another options may include having students group desks together to form makeshift tables, letting students sit on the floor, brining in alternative lighting, or turning off the overhead lights all together. Students who have hearing impairments often have sign language interpreters to support overcoming the language barrier, but what about the student with dyslexia? Providing materials that can be read with a screen reader will support those students when visually reading text can become a barrier to the content.

Online courses come with barriers that instructors should inventory as well (Burgstahler & Cory, 2013). One may be the online learning platform (OLS) the university provides. A particular OLS may be new to the institution or overly complicated. A way to break down this barrier is to create or use and existing tutorial for the specific OLS. Allowing a tutorial to be the beginning part of the online course, with course credits or points, helps to mitigate this barrier.

Important to remember with a barrier inventory is that learners should be expected to contribute to this process. What is a perceived barrier for one learner is not for another. A robust discussion of barriers and their eliminations are an important part of any course.

Path #2: Provide options for recruiting interest

Course objectives and the assignments connected to those objectives need to be presented with transparency. An example of this would be "The learner will demonstrate knowledge of issues in school reform, restructuring, and the role of inclusive education in these efforts." The assessment relates specifically to the course objective: "Create a representation of a California school reform, and/or restructuring that include the role of inclusive education." The rubric is connected to both: "Accurate representation of the reform and restructuring elements and specifically contains the role of inclusive education." This process gives transparency for learners to the process of the relevance, value, and authenticity of each assignment or assessment. In both face-to-face and online environments learner choice on how to express their knowledge is important. Examples can include meeting the objectives through an essay, an interactive poster, or using free resources such as Powtoon, Animoto, or Powerpoint with voiceover.

Path #3: Provide options for sustaining effort and persistence

Provide specific places to get help (Grabinger, 2010). The lines between face-to-face and digital course delivery definitely blur with this specific path. Office hours for access to the instructor can, and should, have options for both face-to-face and digital communications. To further encourage options professors should have some face-to-face hours each week, some synchronous options with a delivery system such as Skype or Zoom, as well as a place to put questions asynchronously, usually email. In order to foster collaboration and communication all of the preceding options can be open to group participation. Undoubtedly some learners may prefer to be one on one with their instructor for some questions, and in a group for other questions or content discussions.

Encourage idea sharing by providing a back channel where learners can make comments and pose questions to each other as an ongoing part of course communications. For face-to-face or synchronous delivery this can be a community chat using Padlet, or a shared Google document. For asynchronous delivery this could be a closed Facebook page, Twitter hashtag, and again a Google document.

Path #4 Provide options for self-regulation

Support strategies in executive functions. Students take and post class notes on class website on a rotating basis. Students can self-grade their own online discussions when a rubric is provided. The instructor can ask for a midterm check for learner understanding and mastery of course objectives (i.e., Survey Monkey). This data provided allows for the learners to self-check where they are in understanding the class objectives, and allows for the instructor to customize learning. Communicating frequently with the whole class by sending a weekly email helps reduce stress and encourage thinking and self-reflection on course progress.

Path #5: Provide options for physical action

Even in the digital world there is physical action. For example, learners need to be able to physically navigate a laptop, tablet or smart phone to be able to express their ideas and thoughts

through these devices. Instructors need to make sure learners are able to use these devices without physical barriers. In addition instructors need to assure that students are not lacking information to be able to navigate devides. For example, if assignments are in one form only, like a traditional paper, this may provide students a narrow way to demonstrate understanding of the goal. By providing alternatives for participation during class time and study time instructors are more likely to get a better response toward the educational goal. In face to face classrooms during lectures, presentations, or class discussions teachers might encourage students by providing alternatives to joining in whole group discussions. Learners could choose to chat in small groups or with one other student, or even to journal privately. Accessing technology to provide the ability for students to text, voice, video, email, Facebook message, Skype etc. In distance learning specific examples for student options might include:

- Encouraging students to make a short video for an assignment using iMovie
- Teaching students how to create a voki. Then giving voki as an assignment alternative.
- Asking students to give a tour of their study area during a synchronous lesson or meeting using the video option.

Path #6: Provide options for expression and communication

Strive for effective alternative assessments based on goals and objectives. One type of expression is not equally suited to every student, or every goal. The current free or low cost opportunities for learners to demonstrate understanding or ask questions is practically unlimited. As an instructor or educational designer do not assume students know how to use enough of these options to make deep choices. Provide new resources for expression and teach learners how to use the specific resources. For example use Viemo, YouTube, Prezi, PowerPoint with voiceover, or Glogster. So instructors are up-to-date of the technologies learners use, ask students to generate resources to share with the class. Instructors should provide consistent communication to students specifically addressing how the course objectives are being addressed during the quarter, semester, or year.

Face-to-face class sessions can be designed to address this progress on a rhythm. For example once a week at the beginning of a class period the instructor can specifically address progress on course goals and objectives. In a digital environment the instructor should send out a weekly email addressing progress to course objectives. Learners should have an opportunity to reflect on their own progress as well. This allows students to take steps to course correct themselves if necessary.

Path #7: Provide options for executive functions

Use the UDL metacognitive goals with transparency by explaining and pointing out instructor thinking around the choices of content and assessment. As when telling a story to illustrate a concept, make a point of telling the students that story telling is an option for multiple means of representation. Instructors should use meta-cognitive goals with transparence by explaining and pointing out instructor thinking around the choices of content and assessment. For example, when telling a story to illustrate a concept, make a point of telling the students that story telling is an option for multiple means of representation. The digital world offers almost too many choices in new applications and programs. Students need a way to judge what options work for them, a way to match the application with the assignment. Teachers need to provide instruction to support learner choices. This does not mean that the teacher needs to have mastery of each option, but instead is willing to learn along side students in making judgments. One

specific example could involve offering a class three choices for an assignment that reflects on interacting with new content, i.e., a book chapter, journal article or lecture: iMovie, PowerPoint with voiceover, or voki. Included in the assignment is a reflection piece on the effectiveness of their choice of expression. Share the reflections with the whole class.

Path #8: Provide options for perception

Start with the Syllabus! Syllabus considerations include presenting the course syllabus in a variety of ways, placing information for support systems and accessibility at the beginning of the syllabus and making the introduction to the course personal and friendly. The instructor should present the syllabus in accessible digital form so that a screen reader may be used. This is helpful for both face-to-face and online courses. Make a video recording out of the syllabus. An excellent example is from the On Campus website developed with CAST: http://udloncampus.cast.org/home#.VE6ccRCF9vk

Path #9: Provide options for language, mathematical expressions, and symbols

Set students up for success by assuming that they will need individual clarification around different concepts (Coy, Marino, & Serianni, 2014). Teach students how to use accessible options for the web platform. Just because every students does not need that level of accessibility doesn't indicate that they should not be able to use these features. It's empowering for all and included in most common resources such as Google and word.

Path #10: Provide options for comprehension

Use the power of webcasts and web-based conferencing. Explore and understand the visual, audio, and interactive features of webcasts. Use web conferences to engage students in an alternative form to check comprehension.

- Use Zoom (www.zoom.com) for planned synchronous instruction. This is a low cost interactive tool that participants join through a website, and students can see each other's facial expressions.
- Google Hangouts. If Pope Francis can run a Google hangout, so can you.

Construct Relevance

Constructs are the knowledge, skills, or abilities that are measured by assessments. Instructors should continually evaluate the assessment required of students and consider that irrelevant factors may impede accurate assessment of individual student knowledge, skills and abilities. For example, differences in organization and time management, or background skills and knowledge could result in inaccurate measurement of student's abilities on course objectives. Traditional discussions are an identifiable barrier for many students in post secondary online courses. Because peer-to-peer learning is so important in university work it is necessary to reduce this barrier. Plan for a variety of ways for student's to interact. Here are some specific ideas:

- Create a Facebook page that is open only to the students in the course. Assign postings, (written, images, videos, graphic organizers) based on reaction to content, encourage and then assign students to comment on each others posts.
- GIFs. Go to Facebook, message a friend, click on GIF button, type in the idea "have a good day" and you can send an expression immediately. Better yet, have students create

their own GIF's to send to each other or the instructor to express ideas and reactions to content.

Table 2 provides specific example of each path in both face-to-face and digital learning environments. Once again, these examples begin the conversation. Professor's deep content knowledge will propel rigorous ideas that meet the lens of UDL, opening doors to content important for learners to master on their way to success.

Table 2. Guidelines with UDL

Plan with Universal Design for Learning	**Face to Face Example**	**Digital Example**
Identify Barriers	Check the physical environment for lighting, power sources, group work spaces.	Online learning systems provided by the institution that are overly complicated, new to the students, or professors. Provide access to tutorials.
Provide options for recruiting interest	Connect course objectives to assignments with transparency. Offer choices for assignments including an essay, a group presentation, or an illustrated book chapter.	Give learners choices whenever possible when interacting with both objectives and content. Examples include using UDLBookbuilder, Animoto, Powtoon, and working as individuals or groups.
Provide options for sustaining effort and persistence	Encourage sharing ideas by providing a back channel where learners can make comments and pose questions to each other as an ongoing part of course communications. Padlet, Google Docs, closed Facebook group, twitter hashtag.	Provide specific places to get help. Office hours can be accessed face-to-face, Skype, Zoom, Google Hangout, instant messenger, Twitter chat.
Provide options for self-regulation	Support strategies in executive functions. Students take and post class notes on class website on a rotating basis. Students self-grade their own online discussions.	Use Survey Monkey to check learner understanding of class objectives. Use this data to allow for student self-check.

	Provide a rubric	
Provide options for physical action	Allow for alternatives for participation during class time, and study time accessing technology to provide the ability for students to text, voice, video, email, Facebook, Twitter etc. In addition to speaking during class discussions, permit learners to write journal reactions or share in smaller groups.	Allow students to make short videos for assignments. Students can use iMovie. Teach students how to use Voki, and use Voki's as an assignment alternative.
Provide options for expression and communication	Use technology choices to provide specific resources for choice. I.e., Viemo, you-tube, Prezi, PowerPoint with voiceover. Ask students to generate resources to share with the class. Do not assume students have mastery of these alternatives. Strive for effective alternative assessments based on construct relevance.	Ask students to generate resources to share with the class to increase options. This allows for the instructor to be aware of new resources, and to understand the resources students find most accessible.
Provide options for executive functions	Use the UDL meta cognitive goals and transparence by explaining and pointing out instructor thinking around the choices of content and assessment.	Provide instruction on how to analyze the digital options available to students.
Provide options for perception	Present the course syllabus in a variety of ways: digitally, recorded explanation, word and pdf.	Access the On Campus website developed by CAST http://udloncampus.cast.org/home#.VE6ccRCF9vk
Provide options for language, mathematical expressions, and symbols	Set up students for success by assuming that they will each need clarification around different concepts.	Teach students how to use accessible options for the web platform, as well as other resources: Google and word.

Provide options for comprehension	Explore and understand the visual, audio and interactive features of webcasts. Use web conferences to engage students in an alternative form to check comprehension.	Use Zoom (www.zoom.com) for planned synchronous instruction.

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