

*Short Communication*

# Universal Design for Learning (UDL) as Facilitating Access to Higher Education

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**Abstract**

Universal Design Learning is a departure from existing paradigms of teaching and learning in post-secondary settings. With the increasing numbers of students with disabilities selecting higher education as a post school option, incorporating UDL in college classrooms is no longer of question of “when” but “how.” While legal mandates for accessibility such as ADA exist to support and address access for individuals with disabilities, the effects of these mandates have still to enter most higher education classrooms. There are undoubtedly many challenges to the implementation of UDL.

*Keywords: Universal Design Learning (UDL), Accessibility, Web Accessibility, WCAG*

**1. Introduction**

Universal Design for Learning was adapted from the field of Architecture. Coined by Ronald Mace, the focus of Universal Design (UD) in Architecture was to provide universal access to variety of environmental spaces. In 1997, Mace and a committee of 10, wrote The Seven Principles of UD. They are: (1) equitable use, (2) flexibility in use, (3) simple and intuitive use, (4) perceptible information, (5) tolerance for error, (6) low physical effort and (7) size and space for approach and use (DeSilva, Nemeroff, & Lopez, 2017). As an educational concept, Universal Design for Learning (UDL) has provided educators with the tools, ideas and structures to create educational access to K-12 and Higher Education students with various disabilities.

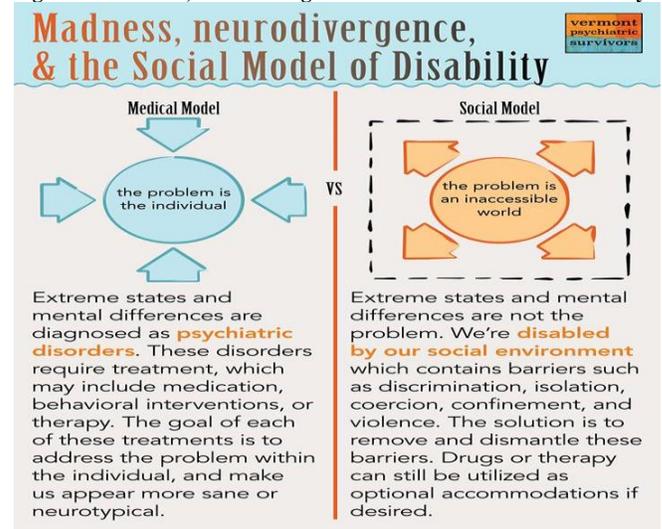
In 2016, the United States Department of Justice investigated the University of California at Berkeley (UC Berkeley) for violation of Title II of the Americans with Disabilities Act (ADA, 1990). They found that the university’s video content was inaccessible to students with visual or hearing impairments. In similar cases, disability activists also sued Harvard and Massachusetts Institute of Technology (MIT) for not providing video captions on their websites. The Chronicle of Higher Education (2017 issue) published a story about Marcie Lipsitt, a veteran disability-rights activist from Franklin, Michigan. She is actively involved in finding university websites that violate the mandates of ADA for accessibility and has requested that the Department of Education’s Office of Civil Rights investigate colleges and universities that violate mandates for accessibility as stipulated by ADA and the Rehabilitation Act (1973). The intent is to address online violations of equal access to all websites, to prevent any type of discrimination. According to the Chronicle, Ms. Lipsitt regards virtually all web pages of higher education institutions as inaccessible to people who are blind or deaf, or who have motor or cognitive disabilities.

**2. Theoretical Framework**

In the last decade, the percentage of students with disabilities seeking higher education has increased tremendously. The Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) of 1990 have opened the gates of post-secondary education to students who previously had little access to this opportunity. As Johnson and Fox (2003) assert, the interactional social constructivist model emphasizes the importance of understanding that individuals’ functional limitations can become a disability depending on the nature of the interactions between the individual and the environment.

This interactional social constructivist model can be understood by a comparison of the medical model and the social model that have dominated the disability field.

**Figure A: Madness, Neurodivergence & the Social Model of Disability**



Source: <https://www.vermontpsychiatricsurvivors.org/>

According to Figure A, the medical model diagnoses extreme states and mental differences as psychiatric disorders. These disorders require treatment, which may include medication, behavioral interventions, or therapy. The goal of these treatments is to address the problem within the individual, and make persons appear more sane or neurotypical. In the social model of disability (Levitt, 2017) extreme states and mental differences are not the problem. Persons are disabled by social environments which contain barriers such as discrimination, isolation, coercion, confinement, and violence. The solution is to remove and dismantle these barriers. Drugs and therapy can still be utilized as optional accommodations if desired.

Mike Oliver is best known as the person who conceptualized the "social model of disability", in the 1970s. According to Oliver (1996), it is not individual limitations, of whatever kind, which are the cause of the problems but society's failure to provide appropriate services and adequately ensure that the needs of disabled people are fully taken into account in its social organization (Oliver, 1996, p. 32). The social model, also sometimes referred to as the social constructivist or social constructionist model has provided an effective framework for the discourse on barriers to accessing mainstream educational opportunities experienced by individuals with disabilities. Simply stated, this model is based on the premise that disability is a social construction. Gabel (2010) explains that... "culture at large constructs disability through what is held to be true about normalcy and how truth is represented in cultural symbols, practices and rituals (p. 64). Gabel (2010) elaborates on this idea by differentiating between material structures that are designed to provide resources and / or support to students, and cultural structures as the values, symbols and representations that become the underlying frameworks for discourse, behavior, policy and practice.

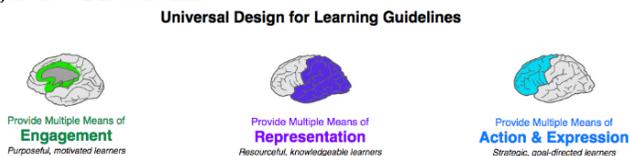
Aquino (2017) contends that the current models isolate disability from other student diversity characteristics, and instead proposes a new conceptual framework the Disability-Diversity (Dis)Connect Model (DDDM). This model addresses disability as an aspect of student diversity. According to Aquino (2017), disability intersects with race, ethnicity, gender, sexual orientation, religious affiliation, etc. However, disability is considered "limiting" and "less than" all of the other aspects of diversity. This view has critical consequences for the life experiences of those who have multiple differences such as minority students with disabilities. Extending conversations about the disability-diversity disconnect is critical to understanding disability as a diversity characteristic. Post-secondary institutions could then increase the acceptance and awareness of disability as another diversity characteristic, and thereby promote acceptance and accessibility of students with disabilities, as they do for other categories of student diversity (Aquino, 2017).

### 3. Universal Design for Learning (UDL)

Universal Design has been adapted to education through a number of models: Universal Design for Learning (UDL), (Hitchcock, Meyer, Rose, & Jackson, 2002), Universal Design for Instruction (UDI), (Scott, McGuire & Shaw, 2003) and Universal Instructional Design (UID)(Silver, Bourke & Strehorn, 1998)

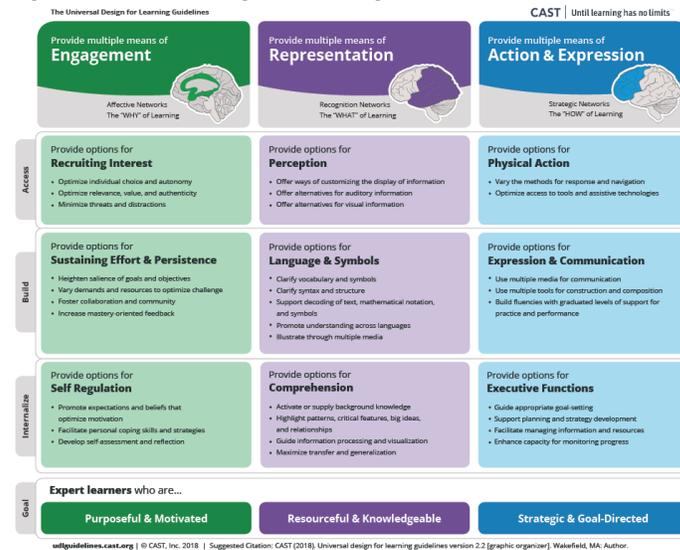
So, what exactly is UDL? "In terms of learning, universal design means the **design of instructional materials and activities** that make the learning goals achievable by individuals with wide differences in their abilities to see, hear, speak, move, read, write, understand English, attend, organize, engage, and remember" (CEC, p. 2). Figure B provides the basic guidelines for UDL.

Figure B: UDL Guidelines



Multiple means of engagement means providing options to connect the content to the learners, and engage them in the learning process. Multiple means of representation requires using multimodal ways to present materials such as text, charts, eBooks, graphs, images and videos. Flexible means of expression enables faculty to create a learning environment that fosters participation by all students as they demonstrate their learning in ways that make them feel successful. These could include writing, oral reports, multimedia or demonstration. The UDL principles can be applied to instructional methods, materials, goals and assessments (Center for Applied Special Technology (CAST, nd).

Figure C: Universal Design for Learning Guidelines.



### 4. Classroom Access for Students with Disabilities in Post-Secondary Settings

Dialogue about access starts from the moment a high school student with a disability considers higher education as a possible next step. Starting with university and college websites where potential students check for all kinds of information, entire websites need to be accessible. The college tour, the admissions process, housing, receiving services through the Disability Services Office, in fact the entire journey through the matriculation process – both academic and nonacademic - are stacked against students with disabilities as, many of the parts are non-accessible, and are barriers to their inclusion in college life as experienced by their nondisabled peers. The problem of access to higher education is so significant that it is beyond the scope of this paper. This paper focuses on strategies that all faculty can use to make their content accessible to students with disabilities in their classrooms.

Universal Design for Learning challenges faculty to think outside the usual parameters, and to critically examine the objectives of the lesson, the purpose of the activities and question if they lead to real learning outcomes for students. UDL is based on one simple principle, flexible instruction and reflective teaching and is generally considered to just be good teaching (Hodge & Preston-Sabin, 1997). The Americans with Disabilities Act (1990) stipulates that postsecondary institutions are responsible for providing necessary accommodations when a student discloses a disability. Accommodations are integral to UDL and are the gateway for gaining access to academic content. These accommodations have to eventually become a part of the teaching, thus enabling universal access. Many of the accommodations provided in the classroom actually facilitate learning for many nondisabled students too. As mentioned in the CAST guidelines, it is important to include a wide variety of materials, and to even invite students to contribute to the collection of materials so that they feel ownership of the learning. Some of the materials could include multiple means of engagement through:

1. Software and devices with Speech-to-Text or Text-to-Speech capabilities
2. Scribes or peer note takers
3. YouTube videos
4. Podcasts
5. Blogs
6. Screen reader software
7. Digital recorders
8. Websites that feature real world applications
9. Accessible and preferential seating etc.

Multiple means of representation through:

1. Slide presentations
2. Graphic Organizers
3. Accessible and downloadable PDFs

4. eBooks
5. Captioning, etc.
6. Large print formats
7. Accessibility applications etc.

Multiple means of expression through:

1. Oral presentations
2. Slide presentations
3. Cooperative group projects
4. Video presentations
5. Software and devices with Speech-to-Text or Text-to-Speech capabilities
6. Websites that feature real world applications etc.

Some accessibility applications include:

1. Big Launcher - simplifies the user interface with smartphone or tablet with enlarged, easy to read text and icons
2. Ideament - converts charts and diagrams to text outlines and vice versa. or brainstorming and organizing concepts
3. Ghotit Real Writer - proof reads and spell checks using advanced grammar and phonetic capabilities. Designed for those with Dyslexia and Dysgraphia
4. Proloquo2go - helps with language development and verbal communication. Caters to those struggling with visual and cognitive skills.

Assessment is an integral part of instruction, and students with disabilities will require accommodations on assessments too. Assessments provide information about student progress and in turn informs future instruction. It is generally considered effective practice to use the same or similar accommodations during assessments as those used in class. For example, if students with Dyslexia or Dysgraphia have a difficult time writing essays, then multiple choice assignments and assessments would be a more accessible option. The important question to ask is, “what is the purpose of the assignment or assessment?” If the purpose is to determine student progress in learning the information, then using essays to assess students with processing issues, would result in “disabling” the students, since writing is challenging for these students. The same would be true of students who are not native speakers of English. Therefore, they would be in a better position to demonstrate their knowledge through means that involve little or no writing. Digital assessments that include Speech-to-Text capabilities would make them accessible to students with processing problems or hearing disabilities. Text-to-Speech resources would provide access to students with visual disabilities. The most important consideration is that, the assignments or the assessments be accessible and promote success for students with varying learning needs.

## **5. Online Instruction and Web Accessibility**

Due to the advancement of communication technology, online learning has been embedded in higher education classrooms including full online, hybrid, and course management systems (CMS) used for both online and face-to-face instruction. Although colleges and universities are aware of web accessibility issues, gaining access to online content and web-based resources is increasingly complicated for students with disabilities. EDUCAUSE surveyed higher education institutions to determine key issues in postsecondary teaching and learning. In 2018, UDL and web accessibility were ranked number two (2) among key issues in teaching and learning (EDUCAUSE, 2018). Web accessibility has been a critical issue on public websites that fail to meet the Section 508 guidelines of the Rehabilitation Act.

Web accessibility is the practice of making online materials accessible to students with disabilities. The primary goal of UDL and web accessibility is to increase learning access and to reduce barriers for these students and others. Thus, if online materials are designed for accessibility, online learning would facilitate academic success for students with disabilities. Online courses provide some enhanced solutions for students who experience issues with accessibility to the content delivered via course management systems. Many of the faculty members who teach online courses are concerned about web accessibility issues particularly their lack of knowledge in meeting accessibility standards. The content they create is often not compatible with web content accessibility guidelines.

## **6. Web Content Accessibility Guidelines (WCAG)**

Web Content Accessibility Guidelines (WCAG) were developed by the World Wide Web Consortium (W3C) as a guideline to address Section 508 of the Rehabilitation Act. This guideline defines how to make web content more accessible to people with disabilities. According to the guideline, Web “content” refers to the information on a web page including text, images, audio, and video (WCAG 2.1). This guideline emphasizes that web content must be perceivable to the users. In order to make web content perceivable, content creators must provide non-text content. Non-text content can be any means other than text such as images, graphs, media, animations, audio, and video.

## **7. Video and Audio with Captions and Transcripts**

Instructional videos and image-based media, such as photographs, graphs, and charts are the most popular non-text content but, creating accessible non-text content is challenging for many educators. Video and audio recordings of instructors can be of a significant benefit to students. Groen, Quigley, and Herry (2016) found that students who have access to and can review video instruction, retain and understand the study material at a higher level. This is especially true for low achieving students. Using video and media in online or hybrid courses is an effective pedagogical approach that not only improves learning experiences for students, but also allows more class time for active learning and engagement. While students benefit from video and image-based instruction, videos and media that do not include captions and transcripts can be a substantial barrier for students with disabilities. Accessibility standards (WCAG 2.1) require that instructional videos and image-based media include alternative text description. Since alternative text can be read by screen reading programs, students who are blind or have low vision can benefit from media that provide alternative texts in online learning environments.

Alternative text can be added to pictures, clip art, charts, tables, shapes, SmartArt graphics, embedded objects, and audio and video. However, alternative text should be built on short sentences with simple and succinct vocabulary. Few words are more appropriate. When inserting images and tables, phrases like “image of” or “table of” should be avoided because screen reading programs generally identify the type of content (Microsoft Office, 2018).

## **8. Making Online Content Accessible in Word Document**

Word is one of the most popular applications in online learning. Word documents can be checked for accessibility before uploading to online systems. Accessibility checker in Word shows inspection results such as errors, warnings, and tips for documents. These inspection reports explain how those errors can be fixed, because errors in Word documents cannot be read by users with disabilities, especially if they are relying on screen reading programs.

Word documents can be improved for accessibility with heading style. The heading style in any Word document is a great way to make online content easier to navigate. Clear and well-formatted heading styles make Word documents more accessible to students with disabilities because screen readers and text-to-speech tools are programmed to recognize these heading styles. When a Word document is saved as another format for downloading, such as HTML or PDF, Word can retain the heading style so it benefits the students. Accessible hyperlink in Word can also increase accessibility. Students with disabilities using screen readers will hear one hyperlinking character aloud at a time. Thus, changing hyperlinking in Word to ordinary language can make them much easier to understand. However, phrases like “Click here” or “Learn more” should be avoided because students who rely on screen readers often browse a list of the article’s links to get an idea of its content. If the display text for all those links is the same generic phrase, it could sound like “Click here, link. Click here, link, Click here, link” (Microsoft Office, 2018).

Adding a meaningful file name to a Word document is another way to make an online document accessible. Meaningful file names are especially important for meeting the new accessibility guidelines. A title and author name to the document property are also part of the US 508 accessibility guidelines.

## **9. Creating Accessible Slides in Presentation Tool**

Presentation tools such as PowerPoint and Google Slide are effective instructional tools in online learning environments. When creating new slides with a presentation tool, it is important to make sure each slide is accessible to users and compatible with accessibility guidelines. First, any content in a slide should be displayed in the intended reading order so the screen reader reads it

correctly for students with a vision or reading disability. As shown in Figure C, objects in the slide are listed in reverse order. A screen reader starts reading from the top of the list which is not the same order as in the slide. Using “Bring Forward” and “Send Backward” buttons, the order can be rearranged so the screen reader can read in the correct order. When inserting multiple layers and objects in the slide, grouping as a single object with alternative text can increase accessibility to users.

Figure C: Screenshot of PowerPoint Selecting Pane



Choosing the right color and style is another way to make presentation slides accessible. Presentation tools include a large collection of accessible templates. This accessible template already has the right colors for contrast and have simple and easy-to-read font style. For example, an off-white background color can help users with perceptual differences like dyslexia. A very bright white background on a slide creates glare, which can blur text. However, too much stark contrast should be avoided because it makes words look distorted for screen readers (Microsoft Office, 2018). Color contrast analyzer, a free application can be a helpful tool to analyze color and contrast. To make color more accessible, information in another form such as color and text, color and shape can be added (WCAG 2.1).

Font style and size that make presentations clear and easy to comprehend are also accessible elements for slide presentations. WCAG 2.1 recommends simple and readable fonts such as sans serif with adequate spacing between letters and an 18-point or larger font size. Good sans serif font styles include Calibri, Franklin Gothic Book, Lucida Sans, and Segoe UI. However, compressed, fancy, italic, or underlined fonts or fonts with uneven line weights should be avoided because those fonts create visual confusion and make letters look merged together to users who with dyslexia.

One idea per slide and limiting the number of lines in each slide are recommended for clear and simple slides along with plenty of space above and below each line. The 6 X 7 rule can be adopted in slide design, which is six (6) words per line and seven (7) lines per slide. To make a slide presentation more accessible to users with disabilities, it is recommended that they be saved in an alternative format such as Word and PDF, which can be read by screen readers. Users can open the presentation on a personal device or port it to a Braille device. Adding the slide title as a heading and providing alternative text to each slide image can also be included because students who use screen readers use the headings of each slide to navigate the document.

## 10. UDL for Academically Diverse Classrooms

The makeup of the college classroom is drastically changing; however, the question is: will the policies, practices, and procedures currently utilized change too? The paradigm of the traditional college student and the traditional college experience is shifting dramatically, and the population of students in higher education is becoming increasingly diverse (Chandler, Zaloudek, & Carlson, 2017). The student population in higher education is changing; according to the National Center for Education Statistics (2018), by 2021 there will be a 25% increase in black student enrollment, a 42% increase of Hispanic student enrollment, and students over the age of 35 will increase by more than 25%. Chandler, Zaloudek, and Carlson (2017) suggest that “there is a rapidly increasing range of academic diversity in higher education, yet many instructors continue to assume that traditional instructional strategies and course designs meet the need of all learners (p. 152). The aforementioned statistics suggest that teaching in a very diverse setting will become the reality for many higher education faculty members. Therefore, this rich diversity in the higher education classroom requires faculty members to welcome change and adopt a willingness to implement policies and practices that promote acceptance, respect, and inclusion of all students.

The use of UDL is a viable framework for supporting diverse learners and more importantly removing barriers of student success for all students in higher education. The primary principles of UDL—multiple means of engagement, multiple means of representation, and multiple mean of action and expression—offer instructors a functional framework to address learning differences and when systematically applied in the classroom help support diverse learners.

## 11. Integrating UDL and Culturally Sustaining Practices for an Inclusive Classroom

Paris (2012) coined the term culturally sustaining pedagogy to emphasize supporting students to “perpetuate and foster—to sustain—linguistic, literate, and cultural pluralism as part of the democratic project of schooling” (p. 95). The combination of universal design and culturally sustaining practices as an approach to teaching and learning has immense potential to enhance inclusive pedagogy. Through integration of universal design and culturally sustaining practices, higher education faculty are provided multiple pathways and flexible means to engage in meaningful interrogation of educational inequities such as race, gender, ability, language class, and sexual orientation. Grier-Reed and Williams-Wenger (2018) suggest that culturally sustaining pedagogy expand and deepen authentic conversations about inclusion and access within universal design.

## 12. Looking Into the Future

There is much that needs to be done to effectively implement UDL in post-secondary settings. Institutions will need to develop guidelines and standards, implement them gradually if not all at once, and evaluate the effectiveness of the UDL practices in concert with effective and best practices in teaching and learning. Stakeholders including administrators, faculty, students, and staff have to be involved in the development and implementation of UDL practices to ensure the widest possible buy-in to such practices. Diversity training that is fairly typical in institutions of higher education, will need to include training in UDL strategies, so that UDL is perceived as part of a commitment towards inclusion of all students, and to ensure effective use throughout the institution (Burgstahler, 2013).

Universal Design Learning is a departure from existing paradigms of teaching and learning in post-secondary settings. However, with the increasing numbers of students with disabilities selecting higher education as a post school option, incorporating UDL in college classrooms is no longer of question of “when” but “how.” While legal mandates for accessibility such as ADA exist to support and address access for individuals with disabilities, the effects of these mandates have still to enter most higher education classrooms. There are undoubtedly many challenges to the implementation of UDL. Primary among these is the financial resources required to implement these practices, and provide ongoing support for maintenance, evaluation and improvement. However, it is important to understand, that like accommodations that are an integral part of inclusive education in K-12 settings, UDL ensures access to ALL students with a variety of learning needs and styles, not just students with disabilities. The need to be proactive in implementing UDL in higher education is therefore paramount.

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