An Introduction to Universal Design for Learning in Higher Education for Instruction Librarians

Emilia R. Marcyk, Michigan State University

Universal Design for Learning (UDL) is an educational framework that integrates the principles of Universal Design and neuroscience research. It is meant to make learning accessible for a variety of abilities, strengths and learning preferences, and operates on the social model of disability: that people are not disabled, but rather are disabled by environments and learning experiences not designed with them in mind (Burgstahler, 2015). Developed and championed by the Center for Applied Special Technology (CAST), it has received wide recognition across K-12 education, especially after its adoption into law (The Every Student Succeeds Act of 2015). However, in higher education, the literature base is still nascent (Roberts, Park, Brown & Cook, 2011), though UDL is likely to become increasingly relevant in post-secondary education as more students who are used to a UDL-based curriculum enter college. The purpose of this essay is to introduce academic instruction librarians to UDL as a tool for designing effective and accessible instruction. It will also explore the conversations about UDL happening in recent higher education and academic library literature, as well as at the author's university.

Overview of Universal Design for Learning

Universal Design for Learning is one of a number of Universal Design (UD)-inspired educational frameworks. While a complete discussion of the various ways that Universal Design has been applied to education is beyond the scope of this article, a key fact is that, unlike frameworks such as Universal Design for Instruction, UDL focuses on the learner, rather than the design of the instruction (Black, Weinbern & Brodwin, 2014; Orr & Hammig, 2009).

UDL is based around three "neural networks," or collections of brain processes: the "affective networks" (addressing the "why" of learning); the "recognition networks" (or the "what" of learning); and the "strategic networks" (which influence the "how" of learning). The UDL framework contains three major principles:

1. Provide multiple means of representation

2. Provide multiple means of action and expression

3. Provide multiple means for engagement (National Center on UDL, 2014).

These three major principles are supported by checkpoints, such as "Offer alternatives for visual information" and "Vary the methods for response and navigation", which provide further detail about how to achieve each major principle. Each checkpoint is supported by a large base of neuroscience and education research into how and why humans learn. The multidisciplinary, research-based rationale and supporting materials are compiled on the National Center for UDL's website (http://www.udlcenter.org/research/researchevidence/), along with the complete UDL guidelines (http://www.udlcenter.org/aboutudl/udlguidelines).

UDL in Recent Higher Education and in Academic Library Literature

Recent articles (defined as 2009 or later) addressing UDL in the higher education literature generally fall into four major categories: empirical experimental or quasi-experimental studies which examine student learning; case studies; articles which examine faculty attitudes towards UDL; and literature reviews. Additionally, there is also a smaller, more specific base of literature which discusses UDL (often in tandem with other UD-related frameworks) in the academic library context.

Empirical Research

Though the checkpoints are backed by an extensive research bibliography, and are based on the best practices suggested by that literature, the research in higher education about the UDL framework as an entity in and of itself is still developing. In his 2010 article in *Learning Disability Quarterly*, Edyburn cautioned that "the claim that UDL has been scientifically validated through research cannot be substantiated at this time" (p. 34), and questioned whether the framework as a whole functions as the creators intended. This may be of concern to some educators. However, the research base has grown since 2010, and shows promising UDL applications within higher education.

Bongey, Cizaldo and Kalnbach (2010) redesigned a large undergraduate biology class using UDL. Compared to students in previous semesters, student grades did not change, but students self-reported liking the choices for learning supported by the UDL content. The sample included a small number of students who identified as having a disability, who appreciated the flexibility offered by the course. In their 2011 article, Schelly, Davies and Spooner report on whether training college instructors in UDL changed student perceptions of the course. Some effects that they identified after administering training included more materials and assignments made available online, better feedback, heavier use of visual aids, and more flexible teaching methodology. In their follow-up study in 2013, they found similar results (Davies, Schelly, & Spooner). Additionally, Black, Weinberg, and Brodwin (2015) looked at student perceptions of UDL principles deployed in a course, and included data from students with and without disabilities. The UDL strategies that students found most useful were "establishing clear expectations, providing advanced organizers, presenting information in multiple formats, giving frequent informative feedback, and using diverse assessment strategies" (p. 19). Students with disabilities in particular found that the course with UDL elements helped them focus more effectively on learning.

Case Studies

There are numerous case studies on UDL that address the redesign of a specific course, and gauge student and faculty reactions. In a redesign of five introductory high-enrollment courses across numerous disciplines, Parker (2012) emphasized

the importance of drawing on a team of experts to help with various technical aspects of teaching with UDL, and found that a redesign made the courses' intent more transparent to students. In Smith's (2012) analysis of a course designed using UDL, she reported that students benefited most from "multiple representations that included class lectures […] hands-on activities, multiple examples and rubrics" (p. 47). In another study, Kumar (2014) designed a health sciences course using the principles of UDL, including presenting course information in multiple ways, setting clear expectations and allowing students to choose among different response types for tests. Students in the course found the design to be "highly effective in their ability to access materials" (p. 137). The UDL design elements were also beneficial to non-traditional students who needed greater course flexibility, and shifted the "locus of control" to the students, which "enabled an environment for self-regulated learning" (p. 138). While all three case studies note the importance of providing varied delivery methods for instruction, they do not advocate for the theory of "learning styles," or the notion that each student can only learn well in one mode (aural, visual, kinesthetic, etc.). Instead, the varied modes of instruction allow students to demonstrate their knowledge in different ways, and help with motivation, attention, interest and accessibility.

Faculty Attitudes towards UDL

A number of articles have examined faculty knowledge about UDL, their level of training, and attitudes toward implementing UDL, and students with disabilities. In a 2011 survey, Lombardi, Murray, and Gerdes found a discrepancy between faculty attitudes about supporting students with disabilities (generally positive) and the implementation of inclusive practices (generally low). Though training could lead to increased variety in classroom presentation methods, awareness did not necessarily lead to actual change in practice. In an example using the Concerns-Based Adoption Model, which tracks the adoption of innovation, LaRocco and Wilken (2013) looked at faculty stages of concern about UDL, and the level of use. They found that most faculty are in the non-user phase (the lowest of eight stages), though they were interested in learning more. Relatedly, Black, Weinberg, and Brodwin (2014) identified the need for more faculty training, since most faculty were not familiar with UDL and universal design.

Literature Reviews[1]

UDL literature reviews collect articles related to a specific type of disability, or summarize the current state of empirical research. In a literature review focused on students with learning disabilities, Orr and Hammig (2009) highlighted several emerging categories of recommendations. Those included: "backwards design, multiple modes of presentation, inclusive teaching strategies and learning supports, inclusive assessment, and instructor approachability and empathy" (p. 181). In 2011, Roberts, Park, Brown, and Cook reviewed empirical studies, and found that more evidence is needed to show that UDL can increase "GPAs, retention rates, and graduation rates" (p. 13). Rao, Ok, and Bryant (2014) identified 13 UDL-related studies between 2005 and 2011. They offer numerous suggestions for research design and reporting to validate UDL's efficacy, though they find the existing research base promising.

Academic Library-Specific Literature

A small number of articles have been published in recent years which address universal design or UDL in library instruction specifically (though more articles certainly address accessibility in other forms). In their 2009 article, Chodock and Dolinger proposed a framework for Universal Design for Information Literacy, based on Universal Design for Instruction. The framework included elements such as ensuring "equitable use" and "tolerance for error," among others. The authors argue that active learning is not just good teaching practice; it is essential for reaching the widest variety of learners in the classroom. Samson (2011) focused on library buildings and services, and recommended UDL as one way to "proactively meet the cultural and accessibility issues encountered by students and staff with disabilities" (p. 270). Libraries should not rely on Disability Access Services (or similar offices) on campus to accommodate students. Zhong (2012) found that students like hands-on learning, and offered specific examples of how to apply each UDL principle to the library environment, which include active learning and scaffolding of content. With the goal of improving access for distance education students, Catalano (2014) redesigned an online course using UDL principles, and interviewed students with a range of disabilities about their learning experiences. Among the suggestions from the participants were setting clear course expectations and due dates, personalized contact with instructor, and course structure to support time management. When redesigning a LibGuide, Webb and Hoover (2015) used UDL as a guideline to incorporate multiple ways for students to interact with information. Overall, it led to a "positive education experience for all students" (p. 549), though they also discussed the difficulty incorporating the entirety of the UDL framework into the library context, since students are not turning in assignments, and there is little time to help students build in supports and motivation over the span of a single class. Students found their guide engaging, but the increased interactivity created unforeseen web accessibility challenges, such as Flash content which is not compatible with screen readers.

Based on the library-specific literature, some of the most effective UDL strategies for librarians include multiple avenues for students to access content (e.g., including a video, step-by-step screen shots, and written directions for searching the catalog), ensuring content meets web accessibility standards, and designing for the abilities of a wide variety of students (instead of the fictional "average student").

Insights from a UDL Faculty Learning Community

Beyond the already published literature, another good way to learn about UDL is to ask teaching faculty about their own experiences using it in their instruction. The author was interested in specifically how faculty reported their practice had changed after they began learning about UDL. The author sent out a short survey to members of a faculty learning community which was engaged in readings and discussions about UDL and web accessibility. The small group consisted of professors, librarians, and academic specialists. Only four members of the group filled out the survey, so no generalizable conclusion can be drawn from the results, but faculty answers nevertheless

provided insights into how individuals incorporated UDL into their teaching.

Some of the specific strategies for incorporating UDL into online and in-person instruction included:

- "Trim down my content to focus on the important concepts and how to present them effectively" (in-person instruction)

- Providing alternate text for pictures (online/blended instruction)

- Captioning videos (online/blended instruction)

- Providing a "transcript as an option for my modular videos has really helped students have an option of reviewing key content from the video without having to watch it" (online/blended instruction)

As one respondent summarized the impact that UDL has had on his/her teaching, "it has helped me be more sensitive to multiple modes of delivery as options for learners to reinforce their learning which has been a benefit to all." Another major concern was flexible assessment. Tobin's 2014 UDL best practices article describes UDL assessment as the "instructor sets the objectives; students define the method and medium" (p. 16), which can mean letting go of traditional formats like papers or tests when those formats are not integral to the knowledge students should take away from the course. Instead, an oral presentation, video, or art installation could be equally effective way for a student to demonstrate her knowledge.

The advice all four respondents offered to other faculty looking to make their teaching more accessible was to use available campus resources, attend training, and read the litera-

ture on accessibility in higher education when possible. One ended the survey on a particularly encouraging note, offering this advice: "While it does take additional time and requires more mindfulness when developing materials, it is not an insurmountable increase in workload, especially if you start preparing early."

The faculty learning community has found a host of useful online resources for creating UDL instruction. Highlights:

- http://webaim.org/: general overview of web accessibility principles

- http://www.captioningkey.org/quality_captioning.html: video captioning best practices

- http://libguides.lib.msu.edu/access: creating online instructional materials (curated by the author)

- http://www.washington.edu/doit/: resources for educators about implementing UDL and other accessible frameworks

Conclusion

Though there is a growing literature base on UDL in higher education, gaps still exist that invite additional study. Further opportunities also exist to discuss the application of UDL in the library classroom, such as exploring how to motivate and provide choices for learners within one-shot instruction sessions, where student contact is limited to two hours or less. UDL appears to have a promising future as a guiding educational framework, and will benefit greatly from further research to expand evidence that these strategies provide the best support possible for all learners.

References

For references, see here http://bit.ly/423_Marcyk

1. Accidentally omitted from original article posting.

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are some things to keep in mind:

- Align SLOs with your campus by having a conversation with your campus' office of assessment and assessment director. As mentioned earlier, conversations with the Director of Assessment early in our process caused us to reformat our SLOs. This allowed our librarians to better communicate our own assessment work with teaching faculty on our campus. We also recommend attending a campus assessment workshop to gain an understanding of how your campus is writing SLOs.

- Develop a standardized curriculum that is used by each librarian. This allows for integrating assessment and simplifies data collection. This also ensures a similar experience for each student.

- Integrate assessment of all SLOs into the curriculum. You can choose to assess only one SLO in a semester, but integrating assessments of all SLOs into your curriculum at the beginning of the process will save you time later.

- Assign a librarian as a lead for each aspect of your pro-

gram. For example, we have a lead for CLIP 2 and another for CLIP 3. The lead librarian will lead assessment data collection, data analysis, report writing, and curricular changes.

Conclusion

Assessment of your instruction program may seem daunting. We have overcome this anxiety by developing a standard curriculum and integrating our assessments into the curriculum. Once your student learning outcomes and assessments are in place, the assessment process can drive itself and becomes a part of each semester's routine. The feedback is so invaluable that it is hard to imagine not having the data to inform curriculum improvements. The payoff of this work is that we are continuously improving the student and librarian classroom experience, and seeing increased learning in our one-shot sessions.

References

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