

Using Universal Design for Learning to Increase the Accessibility of Tertiary Education

Therese M. Cumming^{1,2} 

¹School of Education, University of New South Wales, Australia, ²UNSW Disability Innovation Institute, Australia.

How to cite: Cumming, T. M. 2024. Using Universal Design for Learning to Increase the Accessibility of Tertiary Education. In: 10th International Conference on Higher Education Advances (HEAd'24). Valencia, 18-21 June 2024. <https://doi.org/10.4995/HEAd24.2024.17021>

Abstract

Most universities have support centers for students with disabilities, and the number of this population of students continues to grow. Although support centers provide students with necessary supports to be successful at university studies, they require students to self-disclose, which many are not willing to do. Universal Design for Learning (UDL) is a framework that enables instructors to plan their courses in a way that makes the material accessible to all students from the outset, without the need for modifications and accommodations. UDL has traditionally been employed in primary and secondary school, but there is a growing body of evidence to support its use in tertiary education. This paper provides a definition of UDL, theoretical underpinnings, evidence to support its use in tertiary education, and implications for practice.

Keywords: *Universal Design for Learning; accessibility; instructional principles.*

1. Introduction

Universal design began as an initiative in architecture, whereby environments were designed at the outset to be accessible to people of all ages and abilities, without the need for customisation or specialised design (Burgstahler, 2012). Based on this premise, Universal design for learning (UDL) emerged within the field of education. UDL is a framework that makes it possible for all learners, regardless of ability, to benefit from curriculum planning that caters for a wide variety of learners (UDL-IRN, 2011a). UDL-IRN (2011b) suggest that UDL places the student at the centre of instruction through a curriculum that is deliberately designed to reduce barriers to learning and to reach and accommodate all students before they experience academic or motivational failure.

CAST is recognised as the guiding UDL organisation and developed the UDL Guidelines, which are grounded in research on cognition and learning (Meyer, Rose, & Gordon, 2014). UDL is centred around three planning and instructional design principles that guide curriculum

design with regards to providing content, activities, and pedagogy that address multiple means of representation, action and expression, and engagement (CAST, 2015). These three principles are further defined by 9 guidelines and 31 checkpoints derived from best practices in the literature (CAST, 2018). These can be applied in instructional planning in various ways and at different levels.

Although UDL was initially designed and implemented in primary and secondary school classrooms, there has been a growing movement to employ its principles in the planning and delivery of university curricula. Employing UDL as a pedagogy for post-secondary education would make it possible for students to have full access to course content, despite disabilities or language barriers (Chodock & Dolinger, 2009). UDL was also seen as well-aligned to online course environments through the use of simple supports that ensure all students can access the course materials. Examples of these supports include: a welcome page including a brief video instructing learners on how to navigate the course, captions and transcripts for videos, and accessible documents able to be read by a screen reader (Singleton et al., 2019).

There has been an increasing number of students with disability attending university courses internationally (AIHW, 2017). Cunninghame et al. (2016) conducted a study on the current status and experiences of students with disabilities attending university and found that students with disabilities had a lower success and retention rates than their non-disabled peers. Cunninghame et al. (2016) also discovered that a major issue with the available support services for students with disabilities. Is that the onus is on the students to approach the service provider and disclose, and sometimes provide proof of, their disability. After receiving support, many times students must then continue to disclose their disability to the instructors of every course they enroll in, in order to receive any accommodations. Teaching staff were often unsure about how to provide adjustments, and raised concerns about course integrity in regards to providing adjustments. Lastly, there was an inconsistent approach across institutions regarding the provision of access plans and applying reasonable adjustments. One of Cunninghame et al.'s main recommendations was, "Pedagogical methods, materials and technology should (where possible) adhere to the principles of universal design, and further efforts should be made to provide a variety of options for engaging with learning content and spaces" (p.11).

2. Theoretical Underpinnings

When translated to the educational context, UDL conceptualises learners as diverse in their needs and challenges the view that students learn in some normative way, which education is often designed around (Myer et al., 2014). This conceptualisation is significant for tertiary education, as it emphasises that students having diverse learning needs is "normal," which is an inversion of the thinking behind providing students with accommodations (Singleton et al., 2019). Pproviding multiple means of engagement, representation, and expression in the

classroom normalizes the diverse needs of students rather than stigmatizing them. As a result, students of all abilities are provided with opportunities to engage in the classroom and have their diverse needs met (Singleton et al., 2019).

The theory and practice of UDL are supported by over 800 peer reviewed journal articles. One teaching theory supporting UDL is constructivism, as it considers the different ways that students construct knowledge (Burgstahler, 2011). UDL is based on cognitive neuroscience research, using what is known about the brain during learning to design environments to support all learners. Thus, the three principles of UDL are based on the neurological organisation of the brain (CAST, 2018). Providing multiple means of engagement is aligned with the affective neural networks, involving interest, effort and persistence, and self-regulation. The principle of representation is supported by the recognition neural networks, comprised of perception, language and symbols, and comprehension. The last principle, action and expression is aligned with the strategic neural networks and includes physical action, expression and communication and executive function. One of the key aims of UDL implementation is to support students' metacognition, so can become expert learners (Myer et al., 2014).

3. Evidence to Support the Use of UDL in Tertiary Education

UDL provides equal opportunity for all students to engage in the classroom, by allowing them to access knowledge and demonstrate their understanding flexibly. The literature supports the efficacy of UDL in the tertiary education context. Studies reported high student satisfaction with the implementation of UDL in higher education (Ayala & Christie, 2011; Dean et al., 2017; Griful-Freixenet et al., 2017). When the satisfaction rates of students with disability and without disability were compared, both groups highly valued the UDL model (Ayala & Christie, 2011).

Students indicated that one of the main values of UDL was clarifying course content and increasing their feelings of engagement and capacity to participate in their learning (Ayala & Christie, 2011; Tzivinikou, 2014). Students were highly satisfied that UDL principles enabled them to demonstrate their understanding of course content in the ways they felt best suited their needs and capabilities (Anderson et al., 2018). Students also highlighted that UDL reduced their overall feelings of stress while completing their coursework (Rao, Edelen-Smith & Wailehua, 2015).

Students preferred teacher-generated content that was tailored to the course content, as opposed to third party materials (Dean et al., 2017). They also valued digital technologies such as software that enabled them to post to online learning environments with text, audio, and video (Rao & Tanners, 2011). The use of audio distribution in classrooms was found to create a calm and focussed learning environment (Flagg-Williams, 2016). Other instructor strategies that students valued included short weekly assessments (Rao & Tanners, 2011), as well as

community-forming exercises such as turn-taking in making class notes (Smith & Buchannan, 2012) and peer mentorship (Street et. al, 2012).

Although university instructors implementing UDL principles in their courses felt that UDL improved their teaching, teacher attitudes toward UDL were also a barrier (Ayala & Christie, 2011). Kennette and Wilson (2019) discovered that students perceived UDL elements to be more useful than did faculty members. This could be rectified through appropriate staff training and awareness in the advantages of (Black et al., 2015). Instructor concerns about UDL included the time required to prepare lessons and the impact it may have on student attendance (Bongey et al., 2010). Staff perceptions of the usefulness of UDL impacted the degree that it is implemented in the classroom (Kennette & Wilson, 2019). In summary, appropriate training and mentorship in the implementation of UDL is key to its efficacy.

It has been observed that despite this high satisfaction rate, it is difficult to materially prove UDL efficacy through improvement in student grades, particularly since UDL aims to achieve increased flexibility and engagement (Bongey et al., 2010). Smith and Buchannan (2012) did find that students performed better in assessments where students were given a choice, however further research is required to evaluate this aspect of UDL., however, grades may not be the best indicator of its efficacy. Other considerations for the implementation of UDL is that it does rely on student digital literacy and access to technology, which should be supported by the tertiary institution (Dukes III et al., 2009; He, 2014). Consideration should be given to how learning needs can be met without creating barriers for others (Griful-Freixenet et al., 2017). For example, Kennette and Wilson (2019) found that students did not perceive group work to be useful due to dysfunction, and Watt et al. (2014) raised concerns about the impact that the provision of lecture notes and recordings had on class attendance rates.

4. Conclusions/Implications for Practice

CAST (www.cast.org) guidelines organise the implementation of UDL according to three core principles: multiple means of engagement, multiple means of representation, and multiple means of expression. Burgstahler (2011) of the University of Washington's program, DO-IT has adapted this framework to provide a series of guidelines for tertiary instructors. The strategies recommended for instructors include:

- Presenting information in a variety of formats in a way that is clear, engaging and accessible
- Providing various means for students to communicate and input information
- Ensuring that physical actions are able to be carried out by as many students as possible
- Ensuring instructions are clear and are easy to understand

- Ensuring safety equipment and mechanisms are able to be used and understood by as many students as possible.
- Creating a class climate that values and respects diversity
- Maintaining regular interactions between students and instructors
- Providing specific feedback on a regular basis
- Assessing students by a variety of means
- Familiarising yourself with university policy and means of accommodating student needs

The literature supports the use of UDL in tertiary education, particularly from a student point of view. Both students with and without disabilities appreciated having choices, tailored material, increased engagement and heightened understanding of course content. High levels of student satisfaction make a convincing argument for the use of UDL when designing and delivering university courses. Unfortunately, although some university instructors felt that implementing UDL principles in their practice improved their teaching, instructor attitudes were cited as a barrier, and students felt that UDL incorporation was more useful than the faculty did. The fact that some of the research suggests that instructors without adequate training undervalued UDL principles and felt that students with accommodations had unfair advantages highlights the need for professional development in the area of UDL and supporting students who need accommodations. In addition to professional development, it would be beneficial for instructors to have access to UDL peer ‘experts’ who can mentor them as they apply what they learn to their practice. Online communities of UDL practice would be places that instructors could find and share resources, experiences, and expertise. The Universal Design for Learning Implementation and Research Network (UDL-IRN is a community of practice based in the US. The group is focused on supporting the use of UDL best practice, working on greater interdisciplinary understanding, and enabling collaboration among education stakeholders. The organisation’s website contains resources, research and many opportunities for online and face to face collaboration through conferences, webinars, etc.

The majority of published research on UDL was conducted in the United States, so universities in other countries may need to contextualise findings about best practices to the their specific contexts. Online professional learning for UDL exists from CAST, different US state networks, and in Ireland, through the Association for Higher Education Access and Disability (AHEAD, n.d).

Over four decades of research on UDL and two focused specifically on UDL in higher education suggest that incorporating the principles is best practice for supporting all university students in

accessing the curricula. Incorporating UDL principles is the first step in supporting all students in doing this, including those with disabilities or those whose first language isn't English.

References

- Anderson, K., Davis, D. and McLaughlin, M. (2018) Implementing Universal Design Instruction in Doctor of Nursing Practice Education, *Nurse Educator* 44(5), 245-249.
- Association for Higher Education Access and Disability (AHEAD, n.d.). *Training*. <https://www.ahead.ie/training>
- Australian Institute of Health and Welfare. (AIHW; 2017). Disability in Australia: changes over time in inclusion and participation in education. Cat. no. DIS 69. Canberra: AIHW. <https://www.aihw.gov.au/getmedia/34f09557-0acf-4adf-837d-eada7b74d466/Education-20905.pdf.aspx>
- Ayala, E and Christie, B. (2011) Universal Design for Learning: A Proactive Pedagogical Approach, *Journal of Higher Education and Lifelong Learning*, 18, 121-124.
- Black, R. D., Weinberg, L. A., & Brodwin, M. G. (2014) Universal Design for Instruction and Learning: A Pilot Study of Faculty Instructional Methods and Attitudes Related to Students with Disabilities in Higher Education, *Exceptionality Education International*, 24 (1), 48-64.
- Bongey, S., Cizadlo, G. and Kalnbach, L. (2010) Blended Solutions: Using a Supplemental Online Course Site to Deliver Universal Design for Learning (UDL), *Campus-Wide Information Systems*, 27 (1), 4-16.
- Burgstahler, S. (2011) Universal Design: Implications for Computing Education, *ACM Transactions on Computing Education*, 11 (3), 19:1-19:17
- Burgstahler, S. (2012). Equal access: Universal design of distance learning (pp. 1–4). University of Washington, DO-IT. <http://www.uvm.edu/~cdci/employees/files/UDLofdistancelearning.pdf>
- Center for Applied Special Technology. (CAST; 2015). What is UDL [webpage]. <http://www.udlcenter.org/aboutudl/whatisudl>
- Center for Applied Special Technology. (CAST; 2018). *UDL and the learning brain*. Author. <http://www.cast.org/our-work/publications/2018/udl-learning-brain-neuroscience.html>
- Chodock, T., & Dolinger, E. (2009). Applying universal design to information literacy: Teaching students who learn differently at Landmark College. *Information Literacy and Instruction*, 49(1), 24-32.
- Cunninghame, I., Costello, D., & Trinidad, S. (2016). Issues and trends for students with disability. *National Centre for Student Equity in Higher Education*, Curtin University. <https://www.ncsehe.edu.au/wp-content/uploads/2016/08/Issues-and-Trends-for-Students-with-Disability-Review-of-NCSEHE-Funded-Research.pdf>
- Dean, T., Lee-Post, A. and Hapke, H. (2017) Universal Design for Learning in Teaching Large Lecture Classes, *Journal of Marketing Education*, 39 (1), 5-16 .

- Griful-Freixenet, J. Struyven, K., Verstichele, M and Andries, C. (2017) Higher education students with disabilities speaking out: perceived barriers and opportunities of the Universal Design for Learning framework, *Disability and Society*, 32 (10), 1627-1649.
- Kennette, L. and Wilson, N. (2019) Universal Design for Learning (UDL): Student and Faculty Perceptions, *Journal of Effective Teaching in Higher Education*, 1 (2), 1-26.
- Meyer, A., Rose, D. H., & Gordon, D. T. (2014). *Universal Design for Learning: Theory and practice*. Wakefield, MA: CAST Professional Publishing.
- Rao, K. and Tanners, A. (2011), Curb Cuts in Cyberspace: Universal Instructional Design for Online Courses, *Journal of Postsecondary Education and Disability*, 24 (3), 211-229.
- Rao, K., Ok, M. W., & Bryant, B. R. (2014). A review of research on universal design educational models. *Remedial and Special Education*, 35, 153–166. doi:10.1177/0741932513518980
- Singleton, K., Evmenova, A., Kinase Jerome, M., & Clark, K. (2019). Integrating UDL strategies into the online course development process: Instructional designers' perspectives. *Online Learning*, 23(1), 206-235. doi:10.24059/olj.v23i1.1407
- Smith, R., and Buchannan, T. (2012) Community Collaboration, Use of Universal Design in the Classroom, *Journal of Postsecondary Education and Disability*, 25 (3), 259 – 265.
- Street, C., Koff, R., Fields, H., et. al. (2012) Expanding Access to STEM for At-Risk Learners: A New Application of Universal Design for Instruction, *Journal of Postsecondary Education and Disability*, 25 (4), 363 – 375.
- Tzivinikou, S (2014) Universal Design For Learning - Application In Higher Education: A Greek Paradigm, *Problems of Education in the 21st century*, 60, 156-166.
- UDL-IRN. (2011a) Testable Assumptions About UDL in Practice. (Version 1.1). Author. <https://udl-irn.org/wp-content/uploads/2018/01/Beliefs-in-Practice.pdf>
- UDL-IRN. (2011b) Critical Elements of UDL in Instruction (Version 1.2). Author. <http://mits.cenmi.org/>
- Watt, S. Vajoczki, S., Voros, G. et al (2014) Lecture Capture: An Effective Tool for Universal Instructional Design?, *Canadian Journal of Higher Education*, 44 (2), 1-29