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Universally Acclaimed?: A Critical Literature Review of Universal Design for Learning
by

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Abstract

Working in postsecondary student services, in accessibility, I have encountered universal design for learning (UDL) as a *potential* approach to handling students' accessibility needs in professional development workshops, training materials, conversations with colleagues, and best practice guides. While all of these encounters referenced UDL positively, none have pinpointed exactly how it can quantifiably impact accessibility in postsecondary campuses, and what the process of implementing UDL could look like. This paper reviews the landscape of UDL in higher education throughout its history, and determines how the concept is understood today. Through a critical disability theory lens, and drawing from professional experience working in student accessibility services, I trace the emergence of UDL as a framework in higher education, assess the impact of UDL on students and instructors described in the available literature, and review UDL's viability in the current higher education landscape.

Keywords: universal design for learning (UDL), higher education, accessibility, disability, accommodations, student services

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Introduction

Originating from the field of architecture to describe principles adopted to make physical spaces more accessible, universal design has become an emerging framework within education (Pliner & Johnson, 2004, p. 106). In my own experiences working in student accessibility, educators and administrators have expressed interest in universal design for learning (UDL) as a solution to the current model of accommodations. I have observed that class sizes have increased, and the number of students requesting accommodations or modifications have increased at an even sharper rate. However, staff capacity and budgets have not increased proportionately—or at all—to match this growth. As resources to support these students individually are stretched thin, the premise of adopting universal design for learning solutions that may be able to support these students and their differing needs is an appealing one.

In this literature review, I will first establish how disability is handled in higher education today. Then, I will describe how UDL is currently understood in the literature and contextualize the UDL framework. Following this, I will analyze case studies of UDL in action and outline the potential justifications for incorporating UDL into higher education. I will also present the criticisms around UDL both as a subject of research and in practice. The aim of this review is to demonstrate the inaccessibility of the higher education landscape and highlight the ways universal design for learning can—and cannot—address the issue.

Positionality and Theoretical Framework

This literature review will provide an overview of universal design for learning (UDL) and its impacts in higher education for a diverse range of learners. Much of the discussion around UDL is rooted in the disciplines of special education, disability studies, and disability justice. I will represent the scholarship around UDL and students with disabilities proportionate

to the availability of the literature. While UDL considers learners of all backgrounds and identities, learners with disabilities are rightfully the focus of much of the literature around the impact of UDL. Thus, this paper will focus on accessibility for and inclusion of people with disabilities as the core potential impact of UDL, while noting other demographics when relevant.

As staff at a large, public university, I work in accessibility services. Often working directly with students with disabilities, I have firsthand experience with the often ineffective and inefficient ways that accommodations are currently processed in higher education. I am also aware of the barriers inherent to this current system, as I advise students who are unable or reluctant to visit healthcare providers to obtain supporting documentation, to disclose their condition(s) to their institution, and to utilize the accommodations with which they were provided. I will explore these inefficiencies in the next section.

I acknowledge that I am a non-disabled person working in and researching disability and access. My relationship to accessibility in higher education is unidirectional as someone who administers accommodations, not as someone who has received accommodations on the basis of disability. Thus, my perspective is rooted in my positionality— and privilege— as a non-disabled administrator within higher education. In this position, I am not at risk to be systemically harmed by these experiences, whereas the students I work with can face this risk. The work I produce in relation to disability and accessibility will inherently be limited, as I am not disabled. As I explore the experiences of students with disabilities and assess accessibility in higher education through data, it is important for me to address my positionality as an able-bodied person working in accommodations, and my potential to cause harm within that position.

I will be employing critical disability theory (CDT) in this literature review. Critical disability theory refers to an interdisciplinary approach to examine disability's role and function

within society (Hall, 2019). Disability theory is about “scrutinizing not bodily or mental impairments but the social norms that define particular attributes as impairments, as well as the social conditions that concentrate stigmatized attributes in particular populations” (Minich, 2016, p. 3). CDT goes beyond assessing the impact of a disability on an individual and examines the social, political, legal, and economic impact of disability (Devlin & Pothier, 2006, p. 16). Furthermore, CDT also questions the impact of society on the disabled individual. Due to its critical nature, there is a notable absence of CDT in much of the literature about accessibility, disability, accommodations, and universal design for learning in higher education (De Bie et al., 2022, p. 851).

CDT is not just learning more about disability or people with disabilities. Instead, it is a way to understand disability as a social system that impacts everyone— individually and systemically (Schalk, 2017, p. 3). By approaching the research through critical disability theory, I seek to not merely report about students with disabilities but to meaningfully examine the way disability is understood and addressed by higher education, and explore ways to further that understanding.

Accessibility in Higher Education Today

In the status quo, accessibility in higher education is managed by institutions through the medical model, where students with disabilities are supported with accommodations (Kumar & Wideman, 2014, p. 128). With accommodations, environments are built normatively without necessarily considering how they may be experienced by everyone. When someone encounters a challenge in accessing an environment, they individually request a modification that would assist them in access: an accommodation. Though this model satisfies institutions’ legal requirements set out by disability legislation, they are not meaningfully accessible. In order to even have the

opportunity to access accommodations, students must be aware of their own disability, have access to medical care that confirms and seeks to diagnose their experiences, and disclose their disability to their institution (Griful-Freixenet et al., 2017, pp. 1629-1631). Students are typically only eligible to apply for accommodations after they have documentation to support their request. They must submit that documentation to self-disclose their condition to their institutions in order to get assessed for accommodations (Kumar & Wideman, 2014, p. 128). Dong and Lucas (2016) found that only 21% of disabled students at one institution disclosed their disability to the institution. The requirement to disclose disabilities in order to access accommodations thus marginalizes students, particularly those who may not be aware of their disability or unable to receive an accurate diagnosis. Even for those aware, concerns around stigma, penalization, confidentiality, and adequate accommodations persist (Smith, Woodhead, & Chin-Newman, 2021, p. 1360).

When accommodations are subject to disclosure and approval, they also require an individual response to each request (Edyburn, 2010, pp. 35-36). There are further issues with consistency and equitability due to the variability of the factors that inform an accommodation decision. These factors include the details of supporting documentation, the student's own understanding or narrative of their disability, the environments of the accommodations being requested, the legislation in place regarding accommodations, and the professional judgment of the staff member processing the application (Strimel, Francis, & Duke, 2023, p. 81). Through this current model, a response to an accommodation request can also be a rejection, leaving students without access to formalized support to manage challenges on their own. Even with approval, disability is treated as a deficiency of the student rather than of the institution. Thus,

accommodations are regarded as a supplement or a cure (Smith, Woodhead, & Chin-Newman, 2021, p. 1359).

Students' accessibility needs may not be met even after a student goes through the often lengthy, uncomfortable process of disclosing a disability and applying for accommodations. Even once approved, studies have found that faculty are, at best, unprepared and, at worst, skeptical of implementing accommodations for approved students with disabilities (Griful-Freixenet et al., 2017, pp. 1628-1629). Faculty biases regarding accommodations can include the belief that students are approved for accommodations they do not need, that accommodations give students unfair advantages, and that students with accommodations are more difficult to work with (Leung, Moldovan, & Ata, 2023, pp. 54-58). With the prevalence of biases, disabled students, even when approved for accommodations, are at the mercy of individual instructors' willingness to accommodate them. Some instructors are unaware of what reasonable accommodations are possible and how to implement them (Cummings & Rose, 2022, p. 1026). As a result, a disabled student can have an unfairly different experience to not just other students without accommodations, but also to others with similar disability status and approved accommodations like themselves, depending on the course or program. These issues arise because accommodations are "retrofitted" to adapt an already-established learning environment to students on an individual basis (Matthews, Cavanaugh, & Wilson, 2023, p. 191).

Accommodations are an inefficient use of resources as they require an individualized process for each student in order to assess them for accommodations, and additional processes for each course and for each semester to implement accommodations once approved (Kumar & Wideman, 2014, p. 129). By employing an accommodation model, institutions demand constant administrative processes and self-advocacy from students (Smith, Woodhead, & Chin-Newman,

2021, p. 1360). Ultimately, the accommodations model unfairly penalizes students with disabilities in various ways. In doing so, institutions also generate additional work for its administrative staff and instructors for each student with accommodations. The taxing model of reviewing, approving, and implementing each accommodation can also create an implicit incentive to deny students for accommodations, or make it challenging for students to obtain accommodations.

The issues of inefficiency and scalability for institutions processing accommodations become more pressing as more students with disabilities attend higher education. In 2004, Pliner and Johnson noted that the number of students with psychological, physical, and learning disabilities enrolled in American postsecondary institutions had tripled in the past two decades (p. 106). Cumming and Rose noted that in Australia, the percentage of students who disclosed disabilities at their universities increased from 4.2% in 2009 to 7.2% in 2019 (2022, p. 1026). In 2003, Fichten et al. found that overall, 2% of students enrolled in postsecondary institutions throughout Canada self-disclosed as having disabilities (p. 71). More recently, the Canadian University Survey Consortium found that 22% of first-year students at Canadian universities identified as having a disability (Parsons et al., p. 21). In a smaller sample, the number of students registered for accommodations in Ontario universities went from 21,643 in 2010 to 42,000 in 2019 (Parsons et al., p. 21).

The issue is not that students with disabilities are attending higher education. Rather, the issue lies with institutions who admit students with disabilities, often with recruitment materials suggesting available support, but still resist adopting an inclusive curriculum that these students can access (Smith, Woodhead, & Chin-Newman, 2021, p. 1360). Though enrolment rates for students with disabilities have increased, retention and completion rates have not. Postsecondary

students with disabilities have twice the risk of dropping out than their non-disabled counterparts (Griful-Freixenet et al., 2017, p. 1628). This statistic can be attributed to the inherent inaccessibility in higher education, as well as the ultimate inefficacy of the current accommodations model to meet the needs of these students. For students with physical disabilities, accommodations have not been found to impact their academic standing positively or negatively (Parsons et al., 2021), which calls into question their ability to benefit students. In a study of nearly 2000 students, Mamiseishvili and Koch (2011) found that exam accommodations had no positive outcome associated with students with disabilities.

While the same study found that some accommodations such as tutors, scribes, and readers benefitted students with accommodations, they also found that these accommodations were rarely made available to students (Mamiseishvili & Koch, 2011, p. 333). This may be due to the resources required to implement these accommodations. The incompatibility between students with disabilities and the accommodations they are assigned is further reported in research that suggests even when approved, students opt not to utilize accommodations due to their inefficacy or fear of stigma (Toutain, 2019, p. 299). Ultimately, the current model of accommodations does not work for disabled students. As a result, students with disabilities experience disproportionately negative outcomes in higher education. While this impacts the institutions' retention rates and resource expenditure, it undoubtedly impacts these individual students the most.

Origins of Universal Design for Learning

Universal design originated in the field of architecture as an approach to designing physical spaces and products “to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design” (Dallas, Sprong, & Kluesner, 2016). For example,

a ramp would make it possible for wheelchair users to access a building, making it more accessible to individuals with disabilities. But ramps benefit other types of people as well: cyclists, people with strollers, individuals with rolling suitcases or shopping trolleys can all benefit from the presence of a ramp. A ramp is a feature of universal design in architecture that takes into account the needs of those who might otherwise need accommodations and that also makes the space more accessible or usable to people of other demographics.

In education, universal design was adopted into universal design for learning (UDL)—an approach to designing educational materials and spaces that can be understood by all learners (Cumming & Rose, 2022, p. 1026). Instead of implementing modifications to physical environments, UDL shifts the focus to modifications in the learning environments (La, Dyjur, & Bair, 2018, p. 3). The original conceptualization of universal design relied on architects, engineers, production designers, and others to literally remove barriers in physical spaces (Rao, Ok, & Bryant, 2014, p. 153). UDL tasks and challenges educators, administrators, and institutions to move physical and metaphorical barriers for learners in educational spaces. Interest in UDL has grown alongside the demand for increased accessibility for individuals with disabilities in education, as well as the overall interest in diversity, equity, and inclusion in education in the past 30 years (Rao, Ok, & Bryant, 2014, p. 153). UDL's understanding of accessibility as a social responsibility, rather than as an individual one, aligns with critical disability theory. Rather than making students responsible for justifying, requesting, and organizing accommodations, UDL acknowledges the barriers students may be facing and addresses them systemically (Kumar & Wideman, 2014, p. 128).

The Universal Design for Learning Framework and its Principles

Universal design is a concept that can be applied to many different aspects of education. Key approaches to universal design in education include universal design in education, universal design for instruction, universal instructional design, and universal design for learning (Espada-Chavarria et al., 2023, p. 2). UDL remains the most commonly referenced approach, and has a defined framework that can be adopted (Espada-Chavarria et al., 2023, p. 2).

As a framework, UDL focuses on teaching, learning, curriculum development, and assessment (Espada-Chavarria et al., 2023, p. 2). The framework is built around the understanding of 1) systematic variability among learners, 2) learning as equal parts cognitive and emotive, and 3) the different ways the networks of the brain engage, process, and present information for different people (Fornauf & Erickson, 2020, p. 183). The three principles in the framework are justified as being rooted in neuroscience (Altowairiki, 2023, p. 297; La, Dyjur, & Bair, 2018, p. 8; Rose et al., 2006, p. 137). Each principle has a corresponding neurological function in learning: “One that learns to recognize objects or patterns in the external environment, one that learns to generate effective patterns of action or response, and one that learns to evaluate the significance or importance of the possible patterns we encounter or generate” (Rose et al., 2006, p. 137). Affective neural networks are responsible for the first function and engages with information. Recognition neural networks are responsible for the second function and recognizes information. Strategic neural networks are responsible for the third function, and are responsible for organizing and expressing information (La, Dyjur, & Bair, 2018, p. 8). The UDL framework has a set of principles that inform how to best support these functions for the widest possible range of students.

There are three core principles of the UDL framework, and their corresponding neurological functions are as follows:

1. **Provide multiple means of engagement — affective neural networks**

This principle addresses the ‘why’ of learning (Griful-Freixenet et al., 2017, p. 1629).

This principle describes employing different activities throughout a course, sometimes concurrently and other times as alternative options, to capture and sustain student interest (Leung, Moldovan, & Ata, 2023, p. 1). While some students may enjoy highly spontaneous and social activities in the classroom, such as randomly assigned small group discussions, others may dread them and prefer to participate through online discussion boards (Rose et al, 2006, p. 137). Some students seek out face-to-face connection with instructors during office hours, while others may prefer to ask questions via email or via chat during a remote lecture. Some students may have challenges accessing or using electronic technology due to a disability, economic status, or upbringing (Dean, Lee-Post, & Hapke, 2017, p. 6).

No single activity can capture every student’s interest in learning, nor can it suit every student’s greatest strength. Employing different options for students to engage with the materials helps support intrinsic motivation for students to approach learning in a way that best suits them. Examples of multiple forms of engagement include interactive activities such as a debate or a game, group discussions, online discussion board posts, having students each choose a topic that they would like to research, and provision of sample exam questions (La, Dyjur, & Bair, 2018, pp. 11-12). This principle supports the availability of different opportunities for students to relate to their learning (Smith, 2012, p. 34).

2. **Provide multiple means of representation — recognition networks**

This principle addresses the ‘what’ of learning (Griful-Freixenet et al., 2017, p. 1629). It describes making the course material available through a variety of sources to take into account the range of preferences and abilities in learners (Leung, Moldovan, & Ata, 2023, p. 1). Multiple means of representation helps motivate students to connect with their learning, leading to positive outcomes (Espada-Chavarria et al., 2023, p. 3). In some cases, such as students who are blind or deaf, students will not be able to access the learning materials at all unless other means of representation, such as audio files or braille, are employed (Rose et al., 2006, p. 136). In other cases, such as students who have dyslexia or aphasia, students find certain formats, such as videos, easier to study than others. Even when students do not have a condition— or have been diagnosed with a condition, they can benefit from a diversity in representation of learning materials. Students who may have come from a different culture or upbringing than their peers, for example, may benefit from visual aids or written instructions over verbal instructions (Rose et al., 2006, p. 136). As these scenarios clarify, there is no one form of representation that is optimal for all students.

Instructors should employ multiple forms of representation to ensure that “the means for highlighting critical features, emphasizing big ideas, connecting new information to background knowledge, modeling inquiry, and so forth, are fully accessible to all students” (Rose et al., 2006, p. 137). Examples of multiple means of representation include video recordings of lectures, online discussion posts, transcripts of lectures, a shared collection of notes for students to contribute to, and videos or animations that

supplement course content (La, Dyjur, & Bair, 2018, pp. 13-14). This principle promotes a learning environment that provides students with different opportunities to learn (Smith, 2012, p. 34).

3. **Provide multiple means of action and expression — strategic learning networks**

This principle addresses the ‘how’ of learning (Griful-Freixenet et al., 2017, p. 1629). It focuses on assessments and encourages the use of multiple forms of assessment to maximize the ways a student can demonstrate learning (Leung, Moldovan, & Ata, 2023, p. 2). Multiple means of action and expression enables each student to communicate their knowledge in the best way possible for them (Espada-Chavarria et al., 2023, p. 3). Like how no singular way of transferring information to students is universally the best, no singular way for students to demonstrate their knowledge is universally optimal, either. Some students, such as those who have cerebral palsy or a type of paralysis, have limitations in motor skills that would impact their ability to express their understanding in classes (Rose et al., 2006, p. 137). Other students may not have limited motor skills, but have other conditions, such as attention deficit disorder, that affect their ability to strategize and focus on a singular task for a long period of time (Rose et al., 2006, p. 137). Students who may not have any condition, diagnosed or otherwise, may still benefit from different forms of action and expression. Some students excel at researching and writing papers, while others may be better skilled at and more naturally inclined toward creating a video essay or completing a multiple choice quiz.

This principle goes beyond large, cumulative assignments. Providing multiple means of action and expression is about scaffolding supports to student learning and providing

students with as many opportunities as possible to successfully demonstrate their understanding (Rose et al., 2006, p. 137). Other examples of this principle in action would include opportunities for students to receive feedback prior to submitting assignments, review sessions for students to attend, and opportunities for extra credit (Kumar & Wideman, 2014, pp. 131-133). Providing students with a choice of topics, due dates, format of assignments all fall under multiple means of expression (La, Dyjur, & Bair, 2018, p. 16). Other examples include student-led study groups, exams that utilize different types of questions rather than being entirely essay-based or multiple choice, take-home exams, and visuals such as graphics that accompany exam or essay prompts (La, Dyjur, & Bair, 2018, p. 16). This principle encourages educators to supply students with varied opportunities to demonstrate their understanding, and can ensure students are appropriately challenged (Smith, 2012, p. 34).

As noted, these principles are not guidelines (Rose et al., 2006, p. 136). They are, rather, ways to justify and implement accessible learning (Al-Azawei, Serenelli, & Lundqvist, 2016). Various educational development researchers and organizations have developed guidelines for each principle that can be adopted as more of a 'step-by-step' process to implement UDL prescriptively (Matthews, Cavanaugh, & Wilson, 2023, p. 191). CAST, an educational research organization originally named the Center for Applied Special Technology, is credited with developing the Universal Design for Learning Guidelines which provide specific steps that can be taken under each principle (Matthews, Cavanaugh, & Wilson, 2023, p. 191). This framework is often referred to as being rooted in research or evidence based by both researchers and policy makers (Matthews, Cavanaugh, & Wilson, 2023, pp. 190-191). CAST has been credited for

developing the framework in the 1990's and publishing its first set of guidelines in 2008 (Singleton et al., 2019, p. 207). UDL Guidelines 2.0 with updated recommendations was published in 2011, and additional processes to support equity beyond disability access were added in 2018 and 2020. UDL Guidelines 3.0 is expected by CAST to launch in 2024 (CAST, The UDL Guidelines, 2018).

The principles of UDL exist as part of a wider framework so that curriculum can be designed to be the least restrictive for all students. Various resources exist to demonstrate the potential benefits of UDL and recommend targeted solutions for specific accessibility issues. However, the broadness of the framework encourages adoption of practices that have broad, potentially multi-fold benefits. Subsequently, one component of the curriculum can enact UDL in the classroom and satisfy multiple principles at once. For example, recording lectures for students to remotely access synchronously and asynchronously after the lecture provides multiple means of engagement and representation at once. Because one initiative can achieve multiple different positive outcomes, and because its proactive nature reduces the need for reactive measures by the instructor or institution, Edyburn (2010) opined that adopting UDL feels “seductively easy” (p. 40).

Institutional and Legislative Support for Universal Design for Learning

While its appeals are evident, universal design for learning (UDL) is still an emerging framework with promising potential outcomes. Most countries, including Canada, do not yet have federal legislation or policy around UDL. However, individual institutions have increasingly acknowledged and endorsed UDL in recent years. The University of Alberta published an article in 2022 committing to UDL as one of the ways it will pursue EDI-focused pedagogy (Igobwa & Penney, 2022). The University of Calgary's Taylor Institute of Teaching

and Learning published a multi-author guide to utilizing UDL in higher education (Arcellana-Panlilio & Dyjur, 2021). Similar centres focused on pedagogy based out of the Memorial University of Newfoundland, University of Saskatchewan, McGill University, and the University of British Columbia have all published guides or web pages explaining and endorsing UDL. In Ontario, 10 institutions partnered in 2022 to launch a project to train post-secondary instructors in UDL, and to contextualize UDL as an approach under the Accessibility for Ontarians with Disabilities Act (Benton-Kearney, 2022). Similarly, in Alberta, the Ministry of Education published a 2018 guide about UDL as “an educational approach that benefits all students” (Government of Alberta). While all of these references to UDL in the Canadian educational landscape have been positive, they have not been followed up with concrete plans or funding allocations to support actual implementation of UDL.

In the United States, UDL has been a part of several American educational policies since the 1990’s. In 1998, the Assistive Technology Act defined UDL as

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 maintains high achievement expectations for all students, including students with disabilities and students who are limited English proficient. (Edyburn, 2010, p.34)

The “scientifically valid” description refers to the neuroscientific justifications that support the UDL framework. This definition is referenced again in the 2004 reauthorization of the Individuals with Disabilities Act (Edyburn, 2010, p.34).

The same definition is employed in 2008's Higher Education Opportunity Act (Matthews, Cavanaugh, & Wilson, 2023). Here, UDL is formally endorsed by the American federal government as a way to support higher education students (CAST, UDL in Public Policy). This law, designed to make higher education more accessible to disabled, low-income, or otherwise marginalized students, supports federal grant funding for initiatives that utilize or further develop UDL principles (Lee, 2009). Examples of references to UDL in the Higher Education Opportunity Act include:

- Section 232, Uses of Funds: “Recipients of grants or contracts are encouraged to use funds to “transform the way departments, schools, and colleges of education teach classroom technology integration, including the principles of universal design...”
- Section 251, Teach to Reach Grants: “An eligible partnership that receives a grant under this section shall use the grant funds to develop or strengthen an undergraduate, post-baccalaureate, or master's teacher preparation program by ... [providing] teacher candidates participating in the program with skills related to ... universal design for learning ...”
- Section 726, Grants, Contracts, and Cooperative Agreements: “A grant, contract, or cooperative agreement awarded under this subpart shall be used to carry out one or more of the following activities: The development of innovative, effective, and efficient teaching methods and strategies, consistent with the principles of universal design for learning...”

In 2016, the Every Student Succeeds Act passed, including endorsements for UDL using the same definition as previous legislation. With this legislation, UDL is now supported for use in K-12 education by U.S. federal law. More recently, support for UDL as a tool to facilitate

employment preparation and vocational training was formalized in UDL's inclusion in the 2018 Strengthening Career and Technical Education Act.

Justification for Universal Design for Learning

Overall, public policy and educational scholarship supports the outcome of universal design for learning (UDL) to address existing and emerging issues in education. Universal design for learning recognizes that education has foundationally been designed to be exclusionary. This recognition is foundational to redesigning and reimagining education to include more people. While the origins of UDL focus specifically on differences in learners' abilities, conceptualization of the approach has since expanded to include learners of all backgrounds (Cumming & Rose, 2022, p. 1026). Higher education in the Western context has historically been accessible only to the most privileged: white, Christian, cis, heterosexual students of the upper class (Pliner & Johnson, 2004, p. 106). Due to the similar demographic amongst students, education was designed to be "one size fits all," and for a long time, this did fit the needs of that demographic of students (Griful-Freixenet et al., 2017, p. 1629). However, as previously established, there are more students with disabilities than ever before currently enrolled in higher education. Furthermore, postsecondary campuses are also more diverse in economic status, immigration status, race, and other demographics than ever before (Dean, Lee-Post, & Hapke, 2017, p. 6). In theory, UDL can reduce barriers to learning access for students with different types of marginalization, not just students with disabilities (Pliner & Johnson, 2004, pp.107-109).

The normative tradition of education typically relies on the aforementioned accommodation model for students who experience disability barriers in their learning. UDL does not remove challenges inherent to learning, but can help remove learning barriers to

accessing or engaging with learning (Ashman, 2010, p. 670). Whereas the current model of accommodations is an individual, reactive approach to accessibility, UDL is a social model that proactively addresses accessibility needs for a wide range of demographics (Griful-Freixenet et al., 2017, p. 1629). UDL reckons with the way education is designed with a specific learner in mind (Cumming & Rose, 2022, p. 1027). Rather than cater to this singular vision of a learner, UDL reckons with the reality that learners each have individual needs and thus seeks to meet the needs of a diverse range of people (Cumming & Rose, 2022, p. 1027). UDL also minimizes the barriers of medical documentation and disclosure inherent to the current medical system for accommodations (Pliner & Johnson, 2004, p. 119). While the medical model segregates students based on perceived ability, UDL provides an opportunity for students to learn together and benefit together without processes that make certain students feel othered (Al-Azawei, Serenelli, & Lundqvist, 2016).

UDL restructures the current frame of education delivery and adapts the curriculum to students instead of expecting students to adapt to the curriculum (Edyburn, 2010, p. 34). Rather than requiring individual students who have accessibility needs to adapt to their learning environment, UDL expands the learning environment to adapt to many different kinds of students. UDL identifies exclusionary learning environments— not students and their disabilities— as barriers to learning (Kumar & Wideman, 2014, p. 129). Students with accommodations also report that the process of applying for accommodations is othering, and leaves them feeling marginalized compared to the rest of the student population (Pliner & Johnson, 2004, p. 119). The reality is that not all students with disabilities apply for or are approved for accommodations (Kumar & Wideman, 2014, p. 129). This leaves a gap in the

access of this service and represents a failure in the current model, which UDL can ideally help to rectify.

Ideally, universal design for learning would create educational spaces where students do not need to rely on accommodations and modifications in order to meet their learning needs (Silver, Bourke, & Strehorn 1998, p. 47-49). As a result, the potential for students to engage with the curriculum and perform successfully is maximized (Leung, Moldovan, & Ata, 2023, p. 2). In addition to more effectively including students who might have otherwise required accommodations, UDL can benefit all students by addressing issues that may not have been previously handled through accommodations, supporting students who may not have been eligible for accommodations, and delivering a more flexible curriculum to all students regardless of circumstance (Espada-Chavarria et al., 2023, p. 2). This flexibility enables all students to perform better in different ways (Espada-Chavarria et al., 2023, p. 2).

The potential benefits of UDL go beyond the learner experience and can improve instructor experiences as well. Improved outcomes for students and instructors also positively impact institutional operations overall (Kumar & Wideman, 2014, p. 127), (Pliner & Johnson, 2004, p. 108). In the current medical model for disability services, instructors report feeling confused or overwhelmed by their role in implementing individual accommodations (Singleton et al., 2019, p. 207). In one study, instructors who received training on how to apply UDL into their instruction reported their ability to work with a diverse group of students improved overall (Hromalik, Myhill, & Carr, 2019).

Impacts of Universal Design for Learning In Practice

Considering the pedagogical and service-oriented challenges of the current accommodations model, universal design for learning (UDL) comes off as a particularly

attractive option to navigate accessibility large-scale. Davies, Schelly, and Spooner suggest that by adopting UDL, institutions can address the increasing challenges around low rates of persistence, retention, and program completion that is prevalent throughout higher education today (2013, p. 195). As a result, interest in UDL as a potential large-scale solution to making higher education more accessible has steadily increased. Demonstrated by UDL's frequent mentions in higher education institutions' web content about equity, diversity, and inclusion or accessibility initiatives, there is a tangible interest in institutions adopting UDL. Institutions with a high population of marginalized students, such as rural students or newcomer students, have a particularly high interest in adopting UDL and adapting their education delivery models to be more inclusive of a diverse population (Evans et al., 2010, p. 42).

Though UDL is not yet mandated through institutional or public policy, it has been adopted by individual instructors in postsecondary classrooms in the West (Hromalik, Myhill, & Carr, 2019, p. 93). In my research, I came across eight examples of successful adoption of UDL principles in North American higher education. One of the first cases studies in the literature is a reflection of UDL in practice in a graduate level class at a large, private, American university with 94 students (Rose et al., 2006). Since Rose et al.'s pioneer work in adopting UDL in a class, researchers have documented UDL being employed in higher education in situations including: a distance learning graduate level education course based in Australia (Ashman, 2010), an in-person, introductory research methods course (Smith, 2012), and a special education course for rural pre-service teachers (Evans et al., 2010), a first year Bachelor of Nursing course with 50 students in Canada (Kumar & Wideman, 2014), an introductory marketing course of over 600 students at a large American university (Dean, Lee-Post, & Hapke, 2017), an online health science course at an American research institution (Singleton et al., 2019), and a microeconomics

course taught by a single instructor at a Canadian university (Leung, Moldovan, & Ata, 2023). The diversity of settings in these case studies suggest UDL can play a role in a wide range of higher education settings, across disciplines and degrees. All eight reviewed studies grounded their work in the UDL principles of multiple means of engagement, multiple means of representation, and multiple means of action/expression.

As noted above, case studies of UDL being employed comprises a significant portion of the literature around UDL. The prevalence of these types of articles demonstrates a vested interest in UDL in higher education. They also present qualitative and quantitative data about both the student and instructor experience that is valuable in assessing the impact of UDL on either parties. However, it is important to note that at this stage in the scholarship, these articles contain self-reported data and reflections by the faculty who designed and implemented the UDL solutions. As such, there is an inherent bias in favour of UDL, since these researchers voluntarily implemented UDL into their teaching without external pressure to do so. The data from this research need to be examined with caution, as they are self-reported and can be anecdotal. Additionally, while there are consistencies in the outcome throughout the literature, individual studies often feature a small sample size. Leung, Moldovan and Ata (2023), for example, while documenting data from ten different sections of one class, remark that their findings are “experimental and anecdotal” (p. 5).

However, it is worth noting that educators should engage in opportunities to develop their craft of teaching, and that growth as an educator requires reflection (Smith, 2012, p. 36). While the prevalence of self-reported data represents a gap in the literature, educators questioning, developing, and reflecting on their practice is important, and provides opportunities for them to improve (Smith, 2012, p. 36). Classrooms of reflective, motivated educators can become sites of

discovery for new approaches in the field (Smith, 2012, p. 37). As such, these case studies should not be dismissed as insignificant or unusably biased. Instead, they should be contextualized alongside other research about the impacts of UDL. In their literature review, Cummings and Rose estimate that over 800 peer-reviewed journal articles support the practice of UDL (2022, p. 1027).

Though the scholarship awaits larger-scale, subjective studies around UDL, the currently available literature still paints a cohesively optimistic picture of what UDL can accomplish in a single classroom. Overall, every case study reported a positive outcome as a result of the adoption of UDL principles. Data collected about the student experience demonstrated a positive correlation between the use of UDL in the classroom and the student experience. Smith (2012) found a statistically significant relationship between UDL measures implemented across four classes and total student interest and engagement. In this study, the UDL measures implemented in the course by the instructor, such as the option to select their own topic for an assignment, the provision of hands-on activities, and the option for text-to-speech applications to review course materials, were all rated above average as an instrument of course engagement by students in an end-of-term survey (Smith, 2012). In this study, student perceptions of the UDL course attributes all reported a positive impact on their learning, ranging from 74% reporting that the instructor's request to submit a student profile form was helpful to 100% reporting that the posting of class notes prior to class was helpful (Kumar & Wideman, 2014, p. 134). Leung, Moldovan and Ata (2023) reported that when the instructor followed the framework and made alternate options for assignments available, students who opted for those options performed better in the course overall than those who only opted to engage with one means of representation (p. 6). In Dean, Lee-Post, and Hapke's study of a class with hundreds of students, they administered a survey

with a 72% response rate, and all respondents reported perceiving each UDL instructional tool as effective in helping them learn (2017, p. 10).

Kumar and Wideman (2014) also surveyed students, and found that the majority of students who completed the survey reported the various UDL solutions employed throughout the course to be helpful in their learning. For example, 97% of responses found alternate formats of PowerPoint files helpful, and 83% found that video recordings of their lectures were helpful (Kumar & Wideman, 2014, p. 133). In addition to quantitative data, Kumar and Wideman collected qualitative data through comments in their survey, as well as four interviews. This data provides additional insight into the role UDL played in improving student outcomes. Four thematic outcomes for students from Kumar and Wideman's qualitative data: flexibility, social connection, stress alleviation, and high academic performance emerged as (pp. 134-137).

Al-Azawei, Serenelli and Lundqvist (2016) found in their content analysis that when UDL principles were employed, student outcomes in course design, learning experiences, learning environments, and assessments all improved. Particularly in settings where resources can be limited, such as a rural learning environment, UDL supported effective classroom management by having courses proactively meet the needs of diverse learners (Evans et al., 2010).

Compared to the availability of the ways UDL impacted student outcomes, data about the ways UDL implementation is far more scarce. Though the literature suggests that the adoption of UDL would optimize instructional design, data to support these claims have yet to be published. In a few articles, there were anecdotal reports of a level of satisfaction and positive outcomes for instructors as a result of UDL in their courses. Kumar and Wideman (2014) reported that incorporating UDL into the course was a "positive experience" for the instructor, with impacts such as opportunities to reconsider teaching techniques to be more impactful, feeling more

enthusiastic and engaged about teaching, and having more access to connect with students regarding their learning (pp. 137-138). In her interview with an instructor, Smith (2012) found that the instructor who incorporated UDL solutions into her class felt that these practices had positive outcomes as well (pp. 49-50). Over the course of several semesters of implementing UDL practices, the instructor found that having multiple options to access and review course content, such as note cards, review sheets, and shared study materials from students themselves, resulted in a high level of independence in students (p. 49). Additionally, incorporating different ways to engage students such as video and audio files resulted in high quality student participation that suggested a deep understanding of course materials (p. 49). Ultimately, by administering UDL solutions over the course of several semesters, the instructor reported an improvement in her course overall, resulting in a course that “deleted a lot of silliness” and contained successful UDL practices that could effectively be “customizable” for a wide range of students (p. 50).

Additionally, De Bie et al. (2022) found that adopting flexible deadlines and allowing students to submit work when they felt prepared to do so resulted in a more enjoyable marking experience for instructors, who received higher quality work (p. 861). They also noted that the overall improved quality of work resulted in reduced marking time (p. 861). Rose et al. (2006) similarly celebrated the streamlining of instructor workload through the adoption of UDL. By offering two types of instructor-led review sessions, one where students can listen to the course materials presented in a different format and ask questions and another where concepts that connect to course materials are presented to facilitate discussion for students, they were able to meet the needs of students in various stages of their course comprehension (p. 146). These sessions contributed to high levels of engagement for students as well as the instructors (p. 146).

Overall, Rose et al. (2006) felt that utilizing UDL practices in their course supported instructors in meeting the needs of their diverse classes (p. 150).

Outside of individual instructor experiences, Davies et al. (2013) found in their study that instructors who received training about UDL practices were found to have incorporated UDL practices into their courses (p. 197). In their study of faculty attitudes towards UDL, Black, Weinberg and Brodwin (2014) found that while faculty expressed concerns related to accommodations, these concerns were largely based on the challenges in implementing individual accommodations rather than in an unwillingness to accommodate students. Promisingly, their study also found that faculty who rated themselves as being very familiar with UDL strongly disagreed with negative statements regarding students with disabilities, meaning they regarded these students neutrally, or equitable to other students (p. 56). Those who rated themselves as familiar with UDL also had a better understanding of accessibility overall (pp. 56-57). This correlation between familiarity with UDL and understanding of and commitment to accessibility would be a promising one if reflective of the landscape of higher education instructors overall. While extensive data about UDL's impact is not readily available, Rose et al. (2006) encourages widespread adoption of UDL and increased consideration of environmental factors around accessibility beyond the individual, noting that UDL "presents other options and perspectives on access that will ultimately benefit all students, disabled and nondisabled" (p. 150).

Criticisms about Universal Design for Learning

Though support for universal design for learning (UDL) can be found in public policy and scholarship, the literature around UDL has overall been described as "long on principles and 'best practices', but short on empirical evidence of its benefits" (Davies, Schelly, & Spooner,

2011, p. 18). While hundreds of articles have been published in support of UDL, a comprehensive review of the literature concluded that a majority of the literature is descriptive in nature and lacked validated data regarding the impact of UDL (Tarconish et al., 2023, p. 215). The prevalence of self-reported data in the literature also poses an issue. As previously noted, most articles studying the impacts of UDL in practice have been published by those who have been involved in the implementation of UDL in their case studies. As such, the motivation to report favourable outcomes is high. Additionally, the data from these types of studies are entirely correlational and fail to pinpoint a causal relationship between UDL practices and student outcomes. Because these case studies happen in real classrooms, there often is no control group against which researchers could meaningfully compare outcomes (Davies et al, 2013, p. 197). Thus, the question about UDL's actual ability to be incorporated into higher education and its impacts on the industry overall remains to be answered.

In addition to the gap in the literature for empirical research on UDL, there is also a lack of concurrency around what UDL is. The literature generally concedes that UDL refers to a type of effort to eliminate any type of barriers— literal or metaphorical— and increase accessibility in learning experiences. However, quantifications of such efforts vary greatly, and this adoption is not unanimous. When describing an approach to designing educational environments with as few barriers as possible, universal instructional design, universal design for instruction, and universal design for education are also used (Espada-Chavarria et al., 2023, p. 4). Sometimes researchers distinguish these concepts from UDL, but they often do not. Furthermore, even when the term UDL is employed, the broad nature of the concept can create inherent differences in how the term is applied or understood. Because UDL can refer to anything ranging from adaptive technology to online learning to communities of practice to experiential learning, two researchers

discussing UDL can each have a vastly different understanding of the topic from another. The exact concepts being employed by researchers when discussing UDL remain ambiguous and inconsistent in the literature (Fornauf & Erickson, 2020, p. 185). The literature is similarly broad without a lot of depth in any one aspect of UDL. The lack of depth in the literature, as well as the rife potential for misinterpretation, results in a high level of skepticism around UDL (Tarconish et al, 2023, p. 208).

Though the outcomes of UDL can reduce instructor workload, designing and implementing UDL principles in a course does require significant amounts of training, knowledge, and work. As previously noted, the choice to consider UDL is still largely up to individual instructors rather than departments, programs, or institutions. Instructors are also left on their own to make these types of decisions, meaning they can lack the expertise in instructional design or pedagogy to adequately incorporate UDL into their instruction (Hromalik, Myhill, & Carr, 2019, p. 92). Faculty report that it is challenging to identify whether UDL would even be possible in their classrooms (Hromalik, Myhill, & Carr, 2019, p. 92). Even if they determine UDL would be possible and beneficial, instructors can struggle to make a choice out of the many options available because implementing UDL is a heuristic process rather than an algorithmic process (Hromalik, Myhill, & Carr, 2019, p. 92). Particularly in a higher education setting, instructors have reported challenges in finding adequate ways to incorporate UDL in a way that is both appropriate for learners and manageable for instructors (Ashman, 2010, p. 674). This is further complicated by the reality that many instructors do not have the luxury to hone their pedagogy through trial and error.

Those who have adopted UDL in their higher education classrooms do report an increased workload, at least initially. Although the instructor in Smith's 2012 case study was

satisfied with the improvements in her course as a result of implementing UDL, such improvements required monitoring student engagement, adapting the course to incorporate and eliminate different components of the curriculum, and sourcing different sources to represent content and engage students. This work would require not only dedication from the instructor to UDL and accessibility, but time and resources to enact these changes. Kumar and Wideman (2014) also reported the increased workload from the instructor. Here, the instructor created additional materials to provide multiple means of representation, including video recordings as well as accurate captioning for those videos. While the instructor noted these resources benefit in reducing student questions, they remarked on the large workload that resulted from this initiative (p. 138). De Bie et al. (2022) found similar qualitative data, with instructors feeling they do not have time, energy, or supporting staff to create and adopt new aspects of their curriculum (p. 861).

In the current landscape, training educators around accessibility is often a self-fulfilling prophecy: those already interested in improving accessibility are more likely to undergo training to help them contribute to more accessible spaces, whereas those who do not share a commitment to accessibility do not seek out training opportunities, thus not resulting in improved accessibility (Dallas, Sprong, & Kluesner, 2016, p. 257). Widespread adoption of accessibility around UDL training would be critical to making a large scale impact in accessibility.

In addition to hesitations around workload, the particular interest in UDL is worth examining critically. De Bie et al. (2022) identified five major reasons instructors expressed interest in accessibility in their classrooms, including UDL measures: 1) legal or institutional requirements, 2) support for equity or social justice, 3) effective teaching practices, 4) kindness,

and 5) profit. They cautioned against support for UDL that is implemented without acknowledgement of the ways instructors and institutions are potentially harming students with disabilities (p. 864). Throughout the literature, a key justification or ‘selling point’ of UDL is its ability to impact as many people as possible through one action. However, UDL should not just be a ‘nice’ or ‘efficient’ way to approach teaching, nor should it simply be a way to be legally or institutionally compliant, particularly with the way accommodations are today. UDL should be a critical way of understanding the inaccessibility of higher education, and a large-scale effort towards eliminating barriers for all students. When juxtaposed against the reality of resource-restricted institutions, is UDL viewed with anticipation as a way to shift the burden of accessibility from the individual to the institution, or is it regarded as a budget-saving approach to handling students with disabilities? While UDL is a way to effectively address accessibility issues, sole reliance on UDL can obfuscate the complexities of disability, and result in the same, decontextualized model that fails to adequately meet student needs.

Conclusion

Beyond the scholarship, the limits in the literature reflect the limits of universal design for learning (UDL) in practice. Individual, dedicated instructors can and do improve student experiences in individual courses through the use of UDL. However, without institutional support—in the form of time and resource investment and as a result of meaningful reflection about the inadequacies of the status quo—these infrequent applications of UDL fail to be truly ‘universal’. The absence of dedicated policies regarding UDL suggest that the support for UDL stops at lip service. In order to harness the touted benefits, institutions and policymakers must start dedicating resources to implement UDL initiatives en masse. The reality is that UDL

requires careful consideration and reflection of the status quo to be implemented meaningfully to benefit students with disabilities going forward.

Supporters of universal design for learning present it as a convenient solution to the current issues of accessibility in higher education— it appears to be backed by data, supported by policy, favoured by both instructors and students in studies, and seemingly easy to adopt and let run. However, upon closer examination, there are no guarantees that UDL will take any less work than the current model of accommodations, nor can it be assured that accessibility will meaningfully increase with widespread adoption. In fact, in the studies where UDL appeared most successful and best received, instructors were continually updating and adapting their teaching materials, meaning they were working more often, and in a different capacity than when they had not been utilizing UDL. Currently, UDL is not an abject failure or a cure-all for accessibility woes in higher education. It is meaningfully somewhere in the middle: a promising approach to accessibility that requires more cognitive and empirical research, more time, and more investment in order to determine its true potential and to sustainably reap any of its benefits.

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