Designing for Diversity and Inclusion:
UDL-Based Strategies for College Courses
(Practice Brief)

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Abstract

As institutes of higher education (HE) strive to meaningfully address diversity, equity, and inclusion in practice, Universal Design for Learning (UDL) provides a relevant and timely framework for course design to support all learners. Using UDL as an instructional design framework, educators can proactively address learner variability and reduce barriers for students in HE environments. This self-study describes how UDL experts applied a process of UDL design to their courses. The best practices were identified across three phases: (a) a literature review to identify UDL-aligned practices used by HE instructors, (b) individual and collective reflection on UDL-based practices by the UDL experts, and (c) application of UDL to three HE courses delivered in different formats. The practice brief presents a comprehensive overview of various strategies that HE instructors can use in their courses, in alignment with the three UDL principles.

Keywords: universal design for learning, higher education, inclusion

Universal Design for Learning (UDL) is a scientifically-based framework for proactively designing flexible and engaging instruction for all learners (Rose & Meyer, 2002; Meyer et al., 2014). As institutes of HE strive to meaningfully address diversity, equity, and inclusion in practice, UDL's focus on proactively addressing learner variability and reducing barriers for students has become even more relevant. Faculty can use UDL as an instructional design framework to develop student-centered practices that offer options for engagement, how content is presented, and how students demonstrate learning. The three UDL principles—multiple means of engagement, representation, and action/expression—address both academic and socio-emotional aspects of learning (CAST, 2018; Tobin & Behling, 2018). UDL has been used to support students with disabilities and culturally/linguistically diverse learners (e.g., Savaglio & Spector, 2021) as well as to facilitate more accessible, positive, and creative environments (e.g., Cawthon et al., 2019). UDL levels the playing field and provides equal access to education to all learners by promoting inclusive pedagogy and removing barriers in HE (Fornauf & Erickson, 2020).

In the past decade, many articles have addressed UDL implementation in HE settings, including face-to-face courses, online environments, undergraduate and graduate studies, courses focused on education and other subjects (e.g., Evmenova, 2021; Hollingshead, 2021; Hromalik et al., 2020; Moore et al., 2018). The purpose of this practice brief is to provide an overview of UDL application across HE courses delivered in different formats as well as to illustrate how instructors can incorporate UDL in the HE courses. This brief describes (a) how UDL principles are applied in the current empirical and descriptive literature and (b) how three instructors used a systematic UDL Design Cycle process to remove barriers for learners in HE environments across various types and formats of courses: undergraduate, graduate, face-to-face, and online courses.

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Description of the Problem

The percentage of students enrolled in HE who report having a disability increased from approximately 6% in 1995 to 19.4% for undergraduate and 11.9% for post baccalaureate students in 2019 (National Center for Education Statistics, 2021). In addition, the numbers of students who are first-generation, culturally and linguistically diverse, international, adult learners, and career switchers keep increasing as well (Integrated Postsecondary Education Data System, 2020). The diversity of learners in today's classrooms requires special attention to create inclusive and responsive environments that address variability. Proactively building in options, supports, and scaffolds is possible with UDL (Evmenova, 2021; Rao, 2019). In fact, the Higher Education Opportunity Act (HEOA, 2008) emphasizes the use of UDL as the way to offer flexible and inclusive instruction for ALL learners. HE instructors can benefit from using a systematic design process that integrates UDL and proactively focuses on inclusion and access for all (Rao, 2019).

Description of Practice

In order to compile a comprehensive list of UDL strategies that are used in both research and practice, the authors of this brief, four UDL experts, collaborated in a self-study to explore our shared interest in designing accessible and inclusive higher education opportunities. We are active UDL researchers and UDL implementers in HE who regularly publish about UDL, present at national/international conferences, and participate in service and leadership activities with professional organizations in the UDL field. We used a self-study research method to foster our own professional development and to produce new knowledge about educational practices (Cole & Knowles, 2020). We (a) reviewed the literature to identify UDL-based practices used in HE environments, (b) conducted individual and collective inquiry examining how we used UDL-based practices related to the literature, and (c) applied a systematic UDL design process in our own courses as presented in this brief. During this self-study, we met periodically to discuss findings from the literature and collectively extend our pedagogical ideas about UDL.

For the literature review, we searched for published articles and chapters that met the following criteria: (a) addressed UDL implementation or research in HE environments, (b) published between 2010 and 2021, (c) described UDL application to course design/pedagogy, and (d) specifically referenced UDL. Overall, 37 research-based articles and 31 descriptive articles and book chapters met these criteria (available from the authors upon request). For purposes of this project, we focused on authors' descriptions of UDL guidelines and checkpoints in course design. The first author generated a list of UDL strategies from the articles/chapters, and organized them by the three UDL principles (see Table 1). The fourth author coded a random sample (45% of the set) and established inter-rater reliability at 95%.

Next, we reflected on our own use of the UDL-based practices and strategies identified in the literature review. We individually rated whether and how we used each practice and strategy in our own courses. The rating options included 0 = I don't use it and don't plan to do it; 1 = I already use it; 2 = I hope to use it in the future. We met to discuss in more depth the guidelines and checkpoints from the literature we use in our own courses (see Table 1) and extend our collective understanding of how those strategies reduce barriers for students in HE courses.

Based on these discussions, the first three authors applied UDL to three different HE courses in education, as described in the next section of this practice brief. We used a systematic UDL design process, the UDL Design Cycle (Rao, 2019; Rao & Meo, 2016), to proactively and intentionally reduce barriers and increase access for our students. As a first step, we each considered learner variability in our courses. Learner variability includes the abilities and strengths (e.g., ability to be organized and self-directed), backgrounds and experiences (e.g., speaking multiple languages, resilience due to life experiences), preferences and interests (e.g., preference to learn and brainstorm alone or in a group), as well as support needs (e.g., needing structure to succeed, writing supports, not knowing the expectations for higher education) of our students (Rao, 2019). We then designed assessments, instructional methods, and chose materials/resources to use, taking the UDL guidelines into consideration at each step. In the next section, we describe the three courses we developed based on the discussions of this self-study.

UDL Implementation Examples for Varied Courses and Formats
Case Study #1: Introduction to Special Education; Undergraduate, Face-to-Face Course

Participant Demographics. Students enrolled in this undergraduate, face-to-face *Introduction to Special Education* course were pursuing degrees in elementary or secondary education. To ensure intentional design, the instructor initially reflected on the variability of the potential learners enrolled in this mandatory course. Every semester, students would range from sophomores to seniors, with and without prior experiences with individuals with disabili-

Table 1

UDL Practices and Strategies from the Literature Validated and Used by the Four UDL Experts

Multiple Means of Engagement	Multiple Means of Representation	Multiple Means of Expression
7: Provide options for recruiting interest • Offer choices in assignments, assessments (7.1) • Offer choice in due date, topic, format, etc. (7.1) • Allow groups to choose goals and timelines (7.1) • Create authentic assignments related to the practical applications to future careers (7.2) • Use cases, simulations, hands-on activities (7.2) • Use project-based assessments (7.2) • Organize course in weekly modules (7.3) • Provide simple & consistent navigation (7.3) • Solicit feedback via formal/informal means (7.3) **8: Provide options for sustaining effort and persistence** • Share clear goals & suggested timelines (8.1) • Explain how activities align with goals, objectives (8.1) • Send weekly announcements with an overview of upcoming lesson/module (8.1) • Break assignments in chunks and use different question styles on exams (8.2) • Provide tutorials, step-by-step guides (8.2) • Show technologies to be used prior to class (8.2) • Offer ungraded or optional assignments to practice the course content (8.2) • Create open learning space for peers to offer support when needed (8.2) • Require profiles and introductions (8.3) • Form groups, allow collaborative work (8.3) • Use whole class and small group discussions/in-class activities (8.3) • Form a community of practice (8.3) • Allow turning in components of an assignment for feedback; offer opportunities to revise (8.4) • Incorporate opportunities for peer assessments and feedback (8.4) • Offer feedback in multiple formats (e.g., text, audio, video, group, individual) (8.4)	**1: Provide options for perception** • Use accessible documents (1.1) • Convert PPT to HTML (1.1) • Offer print/digital versions of books and other readings (1.1) • Make auditory content visual; add captions/transcripts/summary (1.2) • Make visual content auditory; add alt text to all images (1.3) • Use color, font with caution; offer color inversion (1.3) **2: Provide options for language, mathematical, expressions, symbols** • Create dictionaries defining key terms (2.1) • Offer access to digital dictionaries, advanced content organizers, instruction protocols (2.1) • Highlight key aspects (e.g., short summary of the article) (2.2) • Explain module organization (2.2) • Send weekly video message highlight previous and/or upcoming content (2.2) • Encourage text-to-speech use (2.3) • Make some readings optional (2.3) • Offer syllabus with an outline (2.3) • Provide links to translators (2.4) • Offer lectures in multiple formats (e.g., presentation, PDF, audio, video, transcript) (2.5) • Use multiple tools to offer content (videos, podcasts, comics, OER infographics, VoiceThread) (2.5) • Use simulations, interactive sites, games, social media, etc. (2.5) • Break lectures for discussion (2.5)	**4: Provide options for physical action** • Varying methods for participating in discussions and submitting assignments (text, audio, video, etc.) (4.1) • Provide access to text-to-speech programs; accessible documents & materials; dictation and voice typing tools (4.2) **5: Provide options for expression and communication** • Offer multiple forms of interaction (e.g., synchronous, asynchronous, individual, collaborative, emails, synchronous, graded, ungraded) (5.1) • Allow participating in discussion in multiple formats (e.g., text, audio, video, multimedia) (5.1) • Support students with code switching between both standard English and local discourse styles (5.1) • Offer multiple tools for submitting assignments (e.g., papers, Google Docs, VoiceThread, video, infographics, multimedia presentations) (5.2) • Allow to express understanding in words, diagrams, other formats (5.2) • Include short assignments to summarize or reflect on a few key points from readings/presentations (5.3) • Require students to submit reading notes in various formats (5.3) • Allow submitting drafts for feedback, resubmission if possible (5.3) • Use graphic organizers (5.3)

(Table 1, continued)

Multiple Means of Engagement	Multiple Means of Representation	Multiple Means of Expression
9: Provide options for self-regulation	3: Provide options for comprehension	6: Provide options for executive functions
• Use gender-neutral language and inclusive examples (e.g., race, culture) (9.1)	• Post discussion prompts at least 48 hours before class (3.1)	• Share weekly objectives and allow to set individual goals for the course (6.1)
• Offer descriptions of assignments, rubrics, outlines, exemplars (9.1)	• Incorporate opportunities to reflect on personal experiences (3.1)	• Use short weekly assignments vs. large high-stakes ones supplemented with clear directions, guiding questions (6.2)
• Model, teach discussion board netiquette (9.1)	• Provide an outline/study guide (3.2)	• Incorporate interactive exercises into lectures (e.g., quizzes, Clickers) (6.2)
• Send welcome message with expectations (9.1)	• Assign/ask volunteers to post notes from synchronous classes (3.2)	• Ensure due dates listed for each activity, assignment, quiz, discussion (6.2)
• Provide weekly self-monitoring checklists (9.1)	• Summarize and highlight salient information from text, diagrams connecting concepts (3.2)	• Offer clear overview of everything included in the lesson/module (6.2)
• Include accommodations/accessibility statement in the syllabus (9.2)	• Offer optional synchronous/outside-of-class time for discussions (3.3)	• Allow gradual release of content (6.3)
• Be available outside of class; offer virtual office hours, chat rooms (9.2)	• Use mnemonics (3.3)	• Create and share introductory video tour for the course and modules (6.3)
• Send individual reminders/messages (9.2)	• Give explicit prompts for each step in an activity (3.3)	• Use individual/collaborative work to compile resources/create portfolio (6.3)
• Put emphasis on effort (9.2)	• Use guest lectures and interviews with stakeholders (3.4)	• Use self-monitoring checklists (6.4)
• Establish on-going self-evaluations (9.3)	• Incorporate multiple perspectives on the topic (3.4)	• Integrate templates to monitor their progress (6.4)
• Embed reflections throughout the course (9.3)		
• Provide a template where students can track their progress towards objectives (9.3)		
• Share a course checklist with regard to UDL adherence (9.3)		

ties. Next, the instructor established clear goals: the learners were to demonstrate the knowledge of special education law, characteristics of IDEA disability categories, and basic concepts of inclusive behavioral and instructional strategies. The assessment had to be consistent across the course sections and included multiple choice quizzes of each textbook chapter.

Description of UDL Implementation. Although the assessment was predetermined, the instructor focused on utilizing flexible methods in the course to support student mastery on assessments. To address learner variability, scaffold the background knowledge, and, as a result, optimize engagement, students were required to read assigned chapters and submit reading notes prior to class. These reading notes, however, could be submitted in any modality: typed notes, photos of handwritten notes, photos of highlighted sections of the textbook, sections of completed study guide for the quiz, or recorded narration of reading reflections. In addition, during the class, students had multiple opportunities to engage with the course materials, the instructor, and each other. This engagement took place through small and large group discussions, hands-on activities, and *Teaching Exceptional Children* article presentations, consistent with UDL's engagement guidelines related to authenticity and relevance.

To demonstrate their knowledge and understanding, students took chapter quizzes. Although quizzes were designed by textbook authors, students had options for taking the assessment. Every four chapters, students could select the quiz modality: verbally during office hours, on paper in the classroom, an online version at home or an online version in the classroom, aligning to UDL guidelines for expression/action. When submitting the assessment, students were asked to provide a rationale for their choice. This component allowed students to develop reflection and self-assessment skills and consider how they learn, which is consistent with UDL's engagement guidelines.

Students had multiple representations of content in the course: through independent reading of the chapter, during lectures, by watching videos, in-class discussions, and article presentations. The content was first introduced to students through independent reading and note taking to provide scaffolds and build background knowledge. Then, the content was reinforced during instructor-led lectures and group discussions. Finally, students enhanced their knowledge by reading scholarly articles and presenting their summaries in class.

Case Study #2: Introduction to Disability; Undergraduate, Synchronous Online Course

Participant Demographics. This undergraduate-level *Introduction to Disability* course utilized a synchronous online model. Students enrolled in this course were pursuing various degrees, including special education, general education, general studies, and other degrees. As a 100-level course with no prerequisites, anyone with an interest in disability could take the course; however, special education majors were required to take the course. Therefore, the instructor knew, based on past participation, that roughly 50-75% of the enrollees each semester would be those interested in pursuing or already declared in special education. Others were viewed as potential recruits to the program and/or fellow advocates for individuals with disabilities. Varied experience levels with individuals with disabilities was also predictable. The instructor identified the goal to ensure that all students, regardless of their prior knowledge, equally engage at a higher level with the content. Therefore, to maximize student experiences relative to their interest, the instructor focused on flexible experiences.

Description of UDL Implementation. Course goals were directly tied to Council for Exceptional Children (CEC) learning outcomes. Course goals were as follows: (a) identify the effects an exceptional condition(s) can have on an individual's life; (b) identify the impact of individuals with exceptionalities academic and social abilities, attitudes, interests, and values on instruction and career development; (c) identify historical foundations, classic studies, major contributors, major legislation, and current issues related to knowledge and practice. To support strategic, goal-directed learning while motivating students by providing options for sustained effort, persistence, and recruiting interests, the instructor created goal-oriented assessments with options for engagement that allowed students to tailor assessments to their individual interests within the goal while actively expressing their knowledge through a selected option.

For example, for the first two goals related to identifying the impact of exceptionalities on the lives of individuals with disabilities, it was essential to consider the varied background experiences and levels of knowledge that students brought to the course. Because some students had personal experience with individuals with disabilities while others had none, the instructor used media articles, movies, and podcasts that students could select, paired with synchronous live discussions to expand all students' understanding of and exposure to the impact of disability. To assess understanding of that impact and to further explore

their understanding, students choose between the following two assignments: (a) conduct an interview of a person with a disability or (b) create an audio/video PSA about a disability.

Case Study #3: Introduction to UDL; Graduate, Asynchronous Online Course

Participant Demographics. In this graduate-level seminar course on UDL delivered in an asynchronous online format, students had varied interests including assistive technology, autism, and applied behavior analysis. Due to the focus of their graduate programs on individualized instruction and support, many students in the course had previous experiences working with learners in one-to-one settings. However, they often lacked applied knowledge of how to support learners with disabilities in inclusive settings using UDL. The course was organized into eight learning modules introducing UDL principles and guidelines across different learning environments (e.g., online, postsecondary) and subject areas (e.g., literacy, math, science, social studies). The instructor incorporated numerous UDL-based strategies in the course (described in detail in Evmenova, 2018, 2021), modeling for students how UDL could provide flexible options and supports. Here we highlight one feature that was used to offer additional opportunities for students to engage with the course content, apply UDL to large classroom settings, and to monitor the quality of their own learning.

Description of UDL Implementation. Providing options for self-regulation is one of the guidelines under UDL's engagement principle. It is important to offer ways for students to self-assess and reflect on their progress as part of developing their own agency as learners. A series of four UDL-based self-assessments was developed to illustrate how UDL could be used in different inclusive environments. The assessment presented a scenario, including the goals of a lesson and description of student characteristics in an inclusive classroom (e.g., grade level, subject, learner abilities, needs, and barriers). The scenario was represented via multiple modalities, such as interactive slides, text, and audio options.

After reviewing the scenario, students were asked to consider learner variability and identify barriers in the curriculum that could arise for students and then to reflect on how UDL-based strategies could be used to reduce barriers and address students' strengths, backgrounds, support needs, and preferences. Students had multiple options for responses including, completing an auto-graded quiz (e.g., multiple choice, matching characteristics to strategies) or submitting a text-based, an audio-based, or a video-based reflec-

tion. While self-assessments were optional, students could receive extra credit for completing one or more. In addition, after completing the self-assessment, students received access to a handout in which the instructor shared and explained her own UDL ideas for the same scenario. Thus, students were able to review and match their ideas to the instructor's decisions. In addition, the instructor provided optional synchronous "UDL chats" where students could ask any questions about self-assessments and/or UDL design.

Evaluation of Observed Outcomes

Across all three HE environments, students' reflections and feedback at midterm and/or at the end of the semester were used to ensure positive outcomes of UDL practices. In addition, as stated above, checkpoints were built-in intentionally throughout the semester to give students the opportunity to reflect on the options and the choices they made. Across multiple semesters, students consistently evaluated all three courses very positively, well above the college benchmark criteria. In their reflections, students shared their appreciation for being given choice in how to participate in quizzes, how to submit assignments, and how to engage with self-assessments. UDL-based strategies were actively used by students as well as rated as highly beneficial. Students felt well-prepared for each class as well as confident in their understanding of the course content at the end of the semester. The vast majority of students achieved all instructional goals and successfully passed the courses. Several students commented on planning to incorporate UDL-based strategies in their own teaching, exemplified in the following summary on an anonymous course evaluation:

> The various ways the material was presented was helpful. It helped me remember the information better. I was able to choose the best method for my learning. The same goes for the assignments; I enjoyed being able to do work in a way I was comfortable with. The creative ways in which we could complete assignments helped me project my personal thoughts and insights more effectively and kept me motivated.

Implications and Portability

UDL can be implemented in HE environments to provide student-centered and inclusive learning experiences for all. By designing courses with UDL at their foundation, instructors can support the varied abilities, needs, backgrounds, and preferences of

learners (Cawthon et al., 2019; Savaglio & Spector, 2021; Tobin & Behling, 2018). This practice brief offers a compilation of UDL strategies validated by the UDL experts that can be incorporated into any HE courses in order to make learning more engaging and inclusive. Courses designed with UDL also model for students how diversity and inclusion can be addressed (Evmenova, 2021; Hollingshead, 2018). While implementing UDL can feel like an overwhelming endeavor, educators can focus on identifying and removing just a few barriers at a time (Rao, 2019) to make it manageable to plan and implement flexible and engaging activities. Strategies presented in this practice brief have significant implications for HE faculty. They can be easily applied following the systematic UDL planning process to courses in any format (e.g., undergraduate, graduate, face-to-face, synchronous online, asynchronous online). Such flexible UDL courses will offer improved access to content for all learners.

Future research should focus on a systematic evaluation of UDL-based strategies, examining which practices work best in varied course formats. In addition, systematic research is needed to evaluate the efficacy of these preferred UDL practices across student populations (undergraduate versus graduate students), and contexts (education-focused majors versus other disciplines). To enhance future practice, readers may begin to implement UDL strategies described in this practice brief by following the models and examples described above. It is our hope that through a transparent self-study of four UDL experts, the readers will find inspiration and courage to make their courses more inclusive and accessible.

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