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DIIU Disability Innovation Institute at UNSW

Universal Design for Learning Framework

Universal Design for Learning (UDL) Framework

UNSW Sydney

This framework is the result of a review of the current literature and practice materials conducted on the use of Universal Design for Learning (UDL) in higher education. The results of the review indicated that students perceived that the use of UDL principles in their coursework enhanced and supported their learning. Instructors who received training and support in using UDL to design and teach their courses found it to be useful in supporting a diverse student cohort. The review also revealed strategies for best practice in UDL at the higher education level. These have been collated into a framework to help guide UNSW staff in more accessible course design and delivery.

Much of this framework is adapted from and based on advice from the Centre for Applied Special Technology (CAST), a non-profit education research and development organisation that works to expand learning opportunities for all individuals through Universal Design for Learning. CAST's work is considered the gold standard in UDL. This framework is meant to contextualise the CAST principles of UDL to the UNSW Sydney teaching and learning environment.

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What is Universal Design for Learning?

Universal design for learning (UDL) is a scientifically valid framework to improve and optimise teaching and learning for all people. It is based on the learning sciences: neuropsychology, human development, and education research. Universal Design for Learning (UDL) is a set of principles for course design and delivery that gives all individuals equal opportunities to learn. The UDL principles provide a blueprint for creating instructional goals, methods, materials, and assessments that take the needs of everyone into account; flexible approaches that can be adjusted for individual needs.

UDL provides flexibility in the ways that information is presented, students are engaged, and students respond or demonstrate knowledge and skills. It 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 have limited English proficiency (Burgstahler, 2013).

According to CAST (2018), The three principles of UDL are:

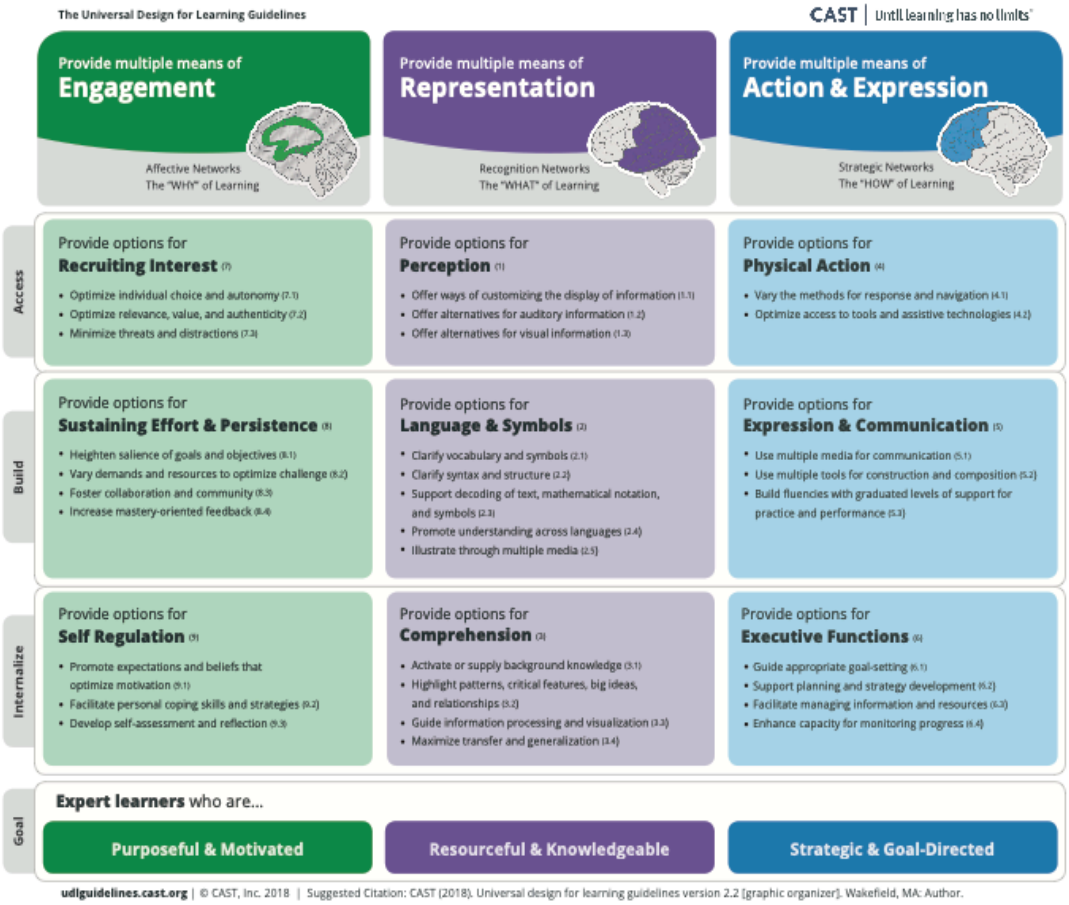
1) ***multiple methods of representation*** that give learners a variety of ways to acquire information and build knowledge;

2) ***multiple means of student action and expression*** that provide learners alternatives for demonstrating what they have learned; and

3) ***multiple modes of student engagement*** that tap into learners' interests, challenge them appropriately, and motivate them to learn.

Figure 1 provides a more detailed explanation of the three principles.

Figure 1. Universal Design for Learning Guidelines (CAST, 2018)



UDL is not about any single specific teaching practice. It is instead a combination of best practice approaches to engage students and challenge them to think critically. It helps instructors meet the learning needs of a diverse student body through a combination of instructional modalities, formats, and technologies. UDL really is simply good teaching; many instructors at UNSW Sydney already incorporate practices that are well aligned with UDL principles.

UDL and Accessibility

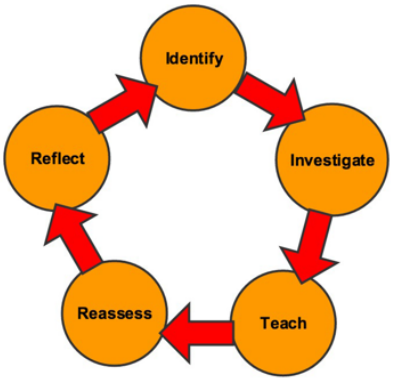
The terms accessibility and Universal Design for Learning are often mistakenly used interchangeably. Although accessibility is a key foundational principle of UDL it is not by itself Universal Design for Learning. Accessibility is an integral feature of the first principle of UDL, multiple representations of information, which dictates that information be accessible and presented in a variety of ways; audio, print, tactile, graphically, by video, and as many other possible ways to ensure students can get the information they need. UDL as a whole also includes the principles of action and expression, and engagement.

Getting Started with UDL

Start with **small steps** and select a specific challenge or issue (is there anything in your course that students seem to have particular difficulty with?).

- You don't need to start with sweeping changes all at once; think about each lesson or topic and make small changes.
- Start with tight learning goals for your students and then provide multiple ways for them to access content materials.
- Make students partners in their learning, have them help drive the changes.
- Think about how each of your course's assessments can be influenced by the guidelines, provide multiple ways to access the information, multiple ways that students can demonstrate their understanding and multiple ways to engage with the curriculum.
- Enlist the help of colleagues, talk with each other about your experiences implementing UDL.

(CAST, 2019)



Nelson (2014) suggests a process that starts and ends with reflecting on the needs and desired outcomes of your students. Ask yourself the following questions:

- **Reflect** on students' needs. "*What are my students struggling with?*"
- **Identify** something to meet that need. *"How might I use this to meet the needs of my learners?"*
- **Investigate** and create new methods or strategies. *"What brings this principle or to life?"*
- **Teach** a lesson using the new method or strategy. *"What does this principle look like in my teaching environment?"*
- **Assess** the new method or strategy. *"How did my students demonstrate knowledge or skills?"*
- **Reflect** on how the new method or strategy worked. *"How did the principle enhance students' outcomes?"*

UDL and Your Course Outline

The course outline provides students with a first look into what to expect from your course. Thus, it is an opportunity for you to set your class climate, discuss your learning and teaching philosophy, identify learning expectations and discuss options and accessibility. (ENACT, 2019)

UDL Principles for course outlines:

1. **Provide multiple means of engagement:** Outline the learning goals and objectives, the relevance of the content, and any opportunities for choice within the course.
2. **Provide multiple means of action and expression:** Use the course outline to communicate regular routines to establish expectations, outline the timing and format of assessments, and offer resources for the management of information.
3. **Provide multiple means of representation:** Be explicit about the ways in which students can access content (e.g., textbook, slides, course website, videos), where to find background information, and provide multiple examples.

The Principles in Action: Planning and Delivering Instruction

F**our critical elements** are intended to serve as a foundation for UDL implementation (UDL-IRN, 2011). Educators using UDL as a foundation for course design and delivery must include each of these four critical elements: Clear Goals, Intentional Planning for Learner Variability, Flexible Methods and Materials, Timely Progress Monitoring.

1. **Clear Goals:** lesson goals are clearly defined, aligned to the learning outcomes, allow multiple options for achievement, address the needs of every learner, are communicated in ways that are understandable to each learner, and can be expressed by them.

2. **Intentional Planning for Learner Variability:** proactive planning that recognises learner diversity and meets the needs of all learners- from challenged to most advanced. Learner strengths and weaknesses are addressed, considering variables such as perceptual ability, language ability, background knowledge, cognitive strategies, and motivation, and anticipates the need for options, methods, materials, and other resources to provide adequate support and scaffolding. Planning maintains the rigour of the lesson by embedding supports and reducing barriers.

3. **Flexible Methods and Materials**: Educators use a variety of media and methods to present information and content, and a variety of methods to engage learners (e.g., provide choice, address student interest) and promote their ability to monitor their own learning (e.g., goal setting, self-assessment, and reflection). Learners use a variety of media and methods to demonstrate their knowledge.

4. **Timely Progress Monitoring:** Formative assessments are frequent and timely enough to plan/redirect instruction and support intended outcomes. A variety of formative and summative assessments (e.g., projects, oral tests, written tests) are used by the learner to demonstrate knowledge and skill.

The table below can be used to plan instruction, ensuring that all principles are represented.

I. Provide multiple means of representation (the 'what' of learning)	
1. Provide options for perception	**Examples**
1.1 Vary ways to display information	Visual information: size, contrast, color, layout, spacing Auditory information: volume, speed, timing, cueing
1.2 Alternatives for auditory information	Text provided for spoken language, voice recognition-to-text, visual symbols for emphasis, sound alerts
1.3 Alternatives for visual information	Text or spoken equivalents for graphics/video/animation, tactile supports for visuals Use of physical objects or spatial models
2. Provide options for language and symbols	**Examples**
2.1 Clarify vocabulary and symbols	Pre-teach vocabulary and symbols, highlight components of complex words, embed vocabulary supports in text – hyperlinks, footnotes, definitions
2.2 Clarify syntax and structure	Make rules and relationships explicit, clarify links between concepts, use less complex vocabulary or language structures
2.3 Support decoding of text, mathematical notation, and symbols	Text-to-speech programs for digital text, use digital math notations (Math ML) with voicing, use text alternatives (mp3s, digital text) with human voicing.
2.4 Promote understanding across languages	Provide students with translation options (apps/websites) to support the presentation of key information in dominant and second languages.
2.5 Illustrate through multimedia	Present complementary representations (e.g. text with animation/graphics), link illustrations and verbal enhancements, make text-to-chart or diagram links explicit
3. Provide options for comprehension	**Examples**
3.1 Activate or supply background knowledge	Activate prior knowledge with imagery and concepts, use organizers (concept maps), pre-teach concepts, "bridge" ideas with analogies & metaphors
3.2 Highlight patterns, critical features, big ideas, relationships	Emphasize key elements, use organizer, prompts and cues to identify and connect key elements, use multiple examples and non-examples, mask or reduce extraneous elements

3.3 Guide information processing and visualisation	Use interactive models, explicit prompts and scaffolds, develop multiple points-of-entry and pathways for content, chunk information, release information progressively
3.4 Maximise transfer and generalisation	Checklists, sticky notes, electronic reminders, mnemonic devices, space out reviews, organizers for note-taking, connect new information and prior knowledge, embed analogies and metaphors
II. Provide multiple means of action and expression (the 'how' of learning)	
4. Provide options for physical action	**Examples**
4.1 Vary the methods for response and navigation	Alternatives in rate, timing, volume, range-of-motion, materials, manipulatives, and technologies, allow response alternatives from standard means (e.g. computer response vs paper and pencil)
4.2 Optimise access to tools and assistive technology	Use multiple means of navigating materials (e.g. by hand, by voice, by switch, by keyboard)
5. Expression and communication	
5.1 Use multiple forms of media for communication	Determine appropriate technologies (physical, sensory, cognitive, communication) needed to access instruction, integrate training to support & enhance learning and goal achievement
5.2 Use multiple tools for construction and composition	Choices may include spell checks, grammar checks, word prediction, speech-to-text software, dictation, recording, sentence starters, story webs, concept webs, outlining tools, calculators, graphing calculators, software for problem solving skills, Computer-Aided Design (CAD)
5.3 Build fluencies with graduated levels of support for practice and performance	Differentiated approaches, strategies, skills to achieve same outcomes, use diverse mentors to guide differentiation processes, gradual release of supports to increase independence
6. Provide options for executive functions	
6.1 Guide appropriate goal-setting	Use a variety of tools (e.g. prompts, scaffolds, models, guides, checklists) to support process of individualised and appropriate goal-setting
6.2 Support planning and strategy development	Use "stop & think" prompts, use checklists and templates to prioritise & sequence, model "think-aloud" process, guide transition from long-term goals to short-term objectives

6.3 Facilitate managing information and resources	Keep information organised and accessible with graphic organisers, templates, embedded prompts, checklists, note-taking guides, software tools
6.4 Enhance capacity for monitoring progress	Develop self-monitoring through guided questions, frequent representations of progress, self-reflection templates, differentiated self-assessment strategies
III. Provide multiple means of engagement (the 'why' of learning)	
7. Recruiting interest	**Examples**
7.1 Optimise individual choice and autonomy	Challenge levels, types of recognition used, vary content or context for learning, choice of information tools, design of products, timing and sequence of tasks
7.2 Optimise relevance, value, and authenticity	Activities personaliased to students' lives, socially relevant, age and ability appropriate, culturally and racially appropriate, active participation, authentic and purposeful outcomes, use of self-reflection
7.3 Minimise threats and distractions	Vary novelty and risk-taking in activities and transitions (predictability, scheduling, routines, novel events), vary sensory stimulation levels (background noise, # of items), vary pace and length of work sessions, vary social demands required for activities
8. Provide options for sustaining effort and persistence	
8.1 Strengthen connections between goals and objectives	Develop explicit goals, restate goals for clarity, clearly display goals, develop sort-term objectives for long-term goals, use prompts to visualize and clarify outcomes
8.2 Vary demands and resources to optimise challenge	Vary difficulty in core activities, use tools and scaffolds to provide alternatives, use collaboration, vary ranges for acceptable work, emphasise process, effort and improvement
8.3 Foster collaboration and community	Cooperative learning groups, clarify roles and responsibilities, positive behavioral supports, differentiated supports, peer tutoring and support systems, connect to virtual communities
8.4 Increase mastery-oriented feedback	Encourage perseverance, self-awareness and self-efficacy, emphasize effort and improvement, give frequent, on-going, and substantive feedback, model evaluation strategies
9. Provide options for self-regulation	

9.1 Promote expectations and beliefs that optimise motivation	Model goal-setting process, coach or mentor students in goal-setting, use prompts, rubrics, & checklists to support self-regulatory goals, on-task behaviors, and self-reinforcements
9.2 Facilitate personal coping skills and strategies	Use differentiated models and feedback to develop skills e.g managing frustration, seeking emotional support, and developing internal control
9.3 Develop self-assessment and reflection	Use tools and models to collect and determine own behaviors (e.g. charts, recording devices, peers), build student self- awareness (and reduce scaffolds) over time
IV. Use multiple means of assessment of student understanding	
10. Assessment	
10.1 Options for methods	Discrete vs elaborative response (i.e. multiple choice vs. essay), varied time allowance, individualized vs group or peer-supported, location varies w/in the curriculum, embedding assessment opportunities
10.2 Options for formats	Visual information: photographs, pictures, picture-symbols, written, computer text, computer text-to- speech, video, kinaesthetic supports (low-tech), Auditory information: Oral, technology-supported (taped, computer speech-to-text, voiced word processing, kinaesthetic supports (low-tech)
10.3 Options for scope/range/level	Choice in number of items, type of items. Choice in focus. Connects across grade levels. Tiered assessments - from “big idea” (all learners) to complex details (some learners), Multiple levels of understanding-concrete through synthesis
10.4 Options for product and outcome	Consider formative vs. summative assessment. Consider authentic assessments with “real-world” products. Include differentiated products (e.g. plays, video productions, essays, point-of-view “rafts”, “tic-tac-toes”, debates, artistic productions, student-driven assessments)
10.5 Options for feedback	Educator: acknowledgement, probing, challenging questions, positive feedback, detained response, real-time vs. delayed Learner: journals, writing, prompts, reflection, peer feedback, self-evaluation, self-awareness

Adapted from the *CAST principles* (2018) and the *Modifications to original CAST Educator Checklist* made by the RI-UDL Workgroup (2009).

UDL in Assessment

CAST (2015) offers advice on aligning assessment to the UDL principles. Read each tip and ask yourself the associated questions.

1. **Align assessment to learning goals**
    a. Are my learning outcomes clear?
    b. Does my assessment measure the intended learning goals, or are there additional components also being measured?
2. **Offer authentic leaning opportunities for assessment**
    a. Helps learners to transfer knowledge and understand the what, how, and why of their learning.
    b. How do my assessments engage learners in understanding the relevance of the content?
    c. Am I providing opportunities for learners to apply acquired knowledge to new situations and authentic experiences?
3. **Assess engagement**
    a. Engagement is essential to the learning process and can support students' metacognition.
    b. How am I assessing student engagement?
    c. What strategies or supports helped a student to persist through a challenge and engage in the learning?
4. **Include frequent formative assessments**
    a. Ongoing frequent ways to measure students' progress towards learning objectives. Examples include: exit tickets, polls, response cards
    b. How can I use information from formative assessments to guide my instruction?
    c. If students are not achieving learning outcomes, how will I redesign my instruction?
5. **Eliminate unnecessary barriers in assessments**
    a. Remove any barriers that are not connected to intended learning goals.
    b. What learning objectives are the assessment measuring?
    c. Is anything preventing learners from showing what they know in my assessment?
6. **Support learner variability through flexible assessments**
    a. Consider the three UDL principles (engagement, representation, action and expression) when designing assessments.
    b. Is it possible to include choice of assessment, how my students can show what they learned, or how they engage in the assessment process?
    c. How do these flexible options still support the measurement of the learning objectives?
7. **Use rubrics to clarify expectations**
    a. Clear communication of expectations through a rubric allows for consistent measurement of the intended goals.
    b. Is the rubric aligned to the intended skills or knowledge?
    c. Have components not tied to the learning objectives been removed from my rubric?
    d. See http://rubistar.4teachers.org/index.php?screen=NewRubric&section_id=1 to create rubrics for flexible assessments
8. **Involve learners in their learning progress through assessment data**
    a. Communicate with students about their progress through formative assessment data, mastery-oriented feedback, and providing guidance for possible adjustments or new strategies that may support the intended skill.
    b. Have I offered timely goal-related feedback?
    c. Have I shared options and strategies to help students build the skills necessary to achieve the learning outcomes?
9. **Reflect on summative assessments for future course design**

a. What kinds of summative assessments am I using to measure learning outcomes? Do they contain barriers to accessibility?
b. What are summative assessments measuring and how can they be used to inform future course design?

10. **Build communities of practice**
    a. How do I collaborate with others to design effective instruction and materials to support the learning objectives as measured through my assessments?
    b. How do I adjust my course after evaluating assessment results/data?

Online Learning

The *UNSW Guidelines for Accessible Blended and Online Co*urses align well with the principles of UDL, as they state:

1. Design the online learning environment to guide and support student learning.

2. Ensure online content can be accessed by screen readers.
3. Provide text alternatives for media.
4. Design for the various ways learners access and engage with online content.
5. Make iterative improvements.

The evidence base suggests the following **best practices in UDL for online and blended learning:**

- Clear and accessible design of the courses' web interface
- Provide opportunities for online and in-class discussion
- Provide instruction that is straightforward and predictable- for example, the student should be able to access every aspect of the course in the same way
- Provide students with advance notice of work (i.e. through course schedule) and a week to complete the work, with at least one week's notice ahead of this
- All online materials should be accessible via tools such as screen readers
- Provide tolerance for error through group work, face to face meeting, peer-tutoring
- Maintain instructional environment with low physical effort
- Encourage students to bring computers to class- provide students without computers with a school computer
- Implement asynchronous online discussions to allow students with limited online access time to participate
- Create learning communities through discussion boards
- If using group-work, place students with good computer literacy with students who struggle
- Demonstrate to students how to access and use the online aspects of the course
- Emphasise the high academic standards to which students will be held
- Avoid cluttered websites
- Reduce the number of web tools used
- Add captions and annotations to multimedia
- Employ different assessment methods
- Provide lectures in text and audio formats
- Consider the compatibility of speech input devices with the web design
- Use consistent web design
- Use small blocks of text with headings
- Enable text to be enlarged
- Avoid using colour as a sole means of delivering information
- Provide sign language interpretation
- Use colours with strong contrast- or have options for students to edit the text to their needs.
- Ensure there are "undo" options for tests and assessments

(Coy, 2016; Dell, Dell, & Blackwell, 2015; Dukes III, Koorland, & Scott, 2009; Pittman & Heiselt, 2014; Rogers-Shaw, Carr-Chellman, & Choi, 2018)

Tools and Resources

http://udloncampus.cast.org/

The definitive website on using UDL in higher education. CAST provides professional development, an electronic guide, videos, case studies, and links to other sources/resources.

https://udl-irn.org

UDL-IRN is a network of education stakeholders. The UDL-IRN's mission is to support the design of future-ready learning environments that are equitable, beneficial, and meaningful for all learners.

http://accessproject.colostate.edu/udl/

This site contains teaching resources, and technical modules, with step-by-step instructions on making courses and teaching and learning materials more accessible for all students.

https://www.washington.edu/doit/programs/center-universal-design-education/overview

The Center for Universal Design in Education (CUDE) develops and collects resources to help educators apply universal design (UD) in order to make all aspects of the educational experience welcoming to, usable by, and inclusive of everyone, including people with disabilities.

https://www.washington.edu/doit/sites/default/files/atoms/files/UDHE-PP_12_18_18_tagged_Compressed.pdf

Universal Design in Higher Education: Promising Practices

Online book available in html and pdf formats.

https://www.ahead.ie

AHEAD is an independent non-profit organisation working to creative inclusive environments in education and employment for people with disabilities. The main focus of their work is further education and training, higher education and graduate employment. Site includes many resources, including free professional development modules

https://www.collegestar.org/modules

This site has many professional development modules and case studies about using UDL for university teaching and learning. Topics include examples from different higher education subject areas, as well as different topics within the UDL framework.

http://enact.sonoma.edu/udl

Developed as a project of the California State University system, UDL-Universe (UDL-U) supports postsecondary faculty and staff by providing resources and examples to improve postsecondary education for all students, including those with disabilities. UDL-U is designed to be useful for individual inquiries related to small UDL topics, issues, or problems, as well as scalable to larger faculty development efforts (e.g., Faculty Learning Communities).

http://cafe.durhamcollege.ca/index.php/curriculum-development/universal-design-for-learning/home-page

Site to support educators in using UDL, with checklists, research, course outline tools, sample lesson plans, organisers, and assessments. Also contains many links to other resources.

UDL Self-Assessment Checklist

This checklist can be used as a quick assessment to show you what you are already doing and areas that need improvement.

In your course, are….

1. ideas and information are represented in multiple ways?

__ Your course outline clearly describes the content and your expectations of the students.
__ You present information in multiple formats (e.g., lecture, text, graphics, audio, video, hands-on exercises).
__ You begin each lecture with an outline of what will be covered.
__ You summarise key points throughout the lecture, and tie these points to the larger course objectives.
__ You post electronic equivalents of paper handouts and required reading assignments in alternative formats such as audio and video.
__ You employ technologies (e.g., iClickers, RamCT) that enhance learning.

2. students can express their comprehension in multiple ways?

__You encourage students to demonstrate knowledge and skills in ways other than traditional tests and exams (e.g., written essays, projects, portfolios, journals).
__ Your assessments measure students' achievement of the learning objectives, as they are stated on the syllabus.
__You incorporate technologies that facilitate class communication and participation.
__You allow assignments to be submitted electronically.

3. students have multiple opportunities for engagement?

__You express enthusiasm for each topic you teach and explain its real-world significance.
__ You challenge students with meaningful assignments.
__You create a class climate in which student diversity is respected.
__You give prompt and instructive feedback on assignments.
__You supplement lecture and reading assignments with visual aids (e.g., photographs, videos, diagrams, interactive simulations).
__You make yourself available to students during office hours in flexible formats (e.g., face-to-face, email, online chat, telephone).

If you answered YES to most or all of these questions, congratulations! You are reaching more students through the principles of **Universal Design for Learning**. (ACCESS, 2010).

References

ACCESS. (2010). How Do You Teach? Retrieved from: http://accessproject.colostate.edu/udl/

Burgstahler, S. (2013). Introduction to universal design in higher education. In S. Burgstahler (Ed.). *Universal design in higher education: Promising practices*. Seattle: DO-IT, University of Washington. Retrieved from *www.uw.edu/doit/UDHE-promising-practices/part1.html*

CAST. (2015). Top 10 UDL tips for assessment. Retrieved from: http://castprofessionallearning.org/project/top-10-udl-tips-for-assessment/

CAST (2018). Universal Design for Learning Guidelines version 2.2. Retrieved from: http://udlguidelines.cast.org

Coy, K. (2016). Post-Secondary educators can increase educational reach with Universal Design for Learning, *Educational Renassiance*, *5*(1), 27-36.

Dell, C., Dell, T., & Blackwell, T. (2015). Applying Universal Design for Learning in online courses: Pedagogical and practical considerations, *The Journal of Educators Online*, *13*(2), 166-192.

Dukes III, L., Koorland, M., & Scott, S. (2009). Making Blended Instruction Better: Integrating the Principles of Universal Design for Instruction into Course Design and Delivery, *Action in Teacher Education*, *31*(1), 38-48.

ENACT. (2019). UDL-Universe: A comprehensive faculty development guide: UDL course changes [website]. Retrieved from: https://enact.sonoma.edu/c.php?g=789377&p=5650624

Nelson, L. L. (2014). Design and deliver: Planning and teaching using universal design for learning. Baltimore, MD: Paul H. Brookes Publishing. p. 136.

Pittman, C., & Heiselt, A. (2014). Increasing accessibility: Using Universal Design principles to address disability impairments in the online learning environment, *Online Journal of Distance Learning Administration*, *18*(3).

RI-UDL Workgroup. (2009). *Modifications CAST Educator Checklist*. Rhode Island College, Providence, RI & University of Rhode Island, Kingston.

Rogers-Shaw, C., Carr-Chellman, D., & Choi, J. (2018). Universal Design for Learning Guidelines for Accessible Online Instruction, *Adult Learning,* 29(1), 20-31.

UDL-IRN. (2011). Critical elements of UDL in instruction (Version 1.2). Lawrence, KS: Author.