Teaching, Modeling, and Implementing UDL for Pre-Service Teachers

Karren Streagle, Ph.D.
Idaho State University
Pocatello, ID, USA
strekarr@isu.edu

Emma Wood
Doctoral Candidate
Idaho State University
woodemma @isu.edu

Abstract
Learning about UDL is essential for pre-service teacher candidates to be prepared to support all learners in their future practice. Seeing UDL modeled by instructors and engaging directly with UDL principles, offers candidates the chance to experience the power of UDL for themselves. Two university instructors in a teacher education program modeled the Principles of UDL in a course about inclusive classroom practices. Their curriculum design decisions are described. The emerging Pedagogical Implementation of UDL model illustrates how two university instructors teach and model UDL Principles as an avenue for their candidates to implement UDL into their future practice.

Keywords
Pre-service, UDL implementation, higher education, teacher education

INTRODUCTION
UDL is widely applied in K-12 education, but less so in the university classroom (Rose, Harbour, Johnston, Daley, & Abarbanell, 2006). However, embracing the Principles of UDL is increasingly more important in higher education (Davies, Schelly, & Spooner, 2013; Rose et al., 2006). Silver, Bourke, and Strehorn (1998) found that Multiple Means of Engagement (in the forms of active learning strategies, a team approach, contextual learning, etc.) and Multiple Means of Representation (in the forms of scaffolding, guided note taking, pairing visual and auditory presentations, and providing materials in class and online) are apparent in higher education. Unfortunately, most university faculty prefer that students take tests or complete assignments in a single format, as opposed to offering Multiple Means of Action and Expression (Thurlow, Johnston, Ketterlin-Geller, 2013). Two issues are at play here: 1) ensuring that future teachers understand and embrace the Principles of UDL so they are prepared to implement UDL in their future practice and 2) leveraging UDL in the university classroom to support all learners. When these two issues are addressed simultaneously, pre-service teachers not only learn about UDL, but experience the power of UDL for themselves. Once they experience the power of UDL on a personal level, they are more likely to implement it in their future practice.

INSTRUCTIONAL CONTEXT
Two university instructors collaborated to teach three sections of an education course entitled "Creating Inclusive Classrooms." One section of the course met face-to-face two mornings a week for an hour and 20 minutes. The other two sections were combined in a distance-learning course where some candidates were face-to-face with the instructor at the primary location and the rest of the candidates participated in the course via video conferencing. The distance learning section of the course met one evening a week for two hours and 40 minutes. The pre-service teacher candidates represented various general education teacher preparation programs: math, reading, social studies, science, music, art, theatre, foreign language, and physical education at the elementary and secondary levels.

The instructors developed the course curriculum guide together, co-planned each week for the entire semester, utilized the same course activities and assignments, and graded some of the same assignments to establish inter-rater reliability for major assessments. The instructors created six small groups across all three sections that collaborated on a weekly group project. The group configurations were intended to provide an opportunity for candidates from similar programs of study (i.e. music, theatre, elementary, etc.) to have meaningful collaboration as they researched different categories of diverse learners (disability, culture and linguistic diversity, etc.) and how to support diverse learners in their future practice from a common context.

CURRICULUM DESIGN DECISIONS
Intentional curriculum design decisions were made by the instructors of this course to create expert learners who would perpetuate the facilitated growth of expert learners by implementing UDL Principles in their future practice.

Engagement
The instructors recruited interest by providing opportunities for candidates to apply course content to their general education area of study (i.e. science, music, etc.) during class activities and on major assignments. The instructors deliberately used homogeneous and heterogeneous groups, both in and out of class, to encourage candidate's to persist in their efforts effort. These groupings allowed the candidates

to focus on their content areas and supported their cross-curricular understandings.

Self-regulation skills were supported in the communication between instructor and candidates. As candidates encountered challenges with a new perspective on the learning process, the instructors were responsive to their needs through scaffolded interactions. For example, in the beginning of the semester, candidates were introduced to the rubric and expectations of a weekly group project. As the semester progressed, the expectation was that candidates would follow the rubric more independently as they became comfortable with the expected performance standard.

Representation

Course materials were managed online for all three sections of the course using Moodle. All assignment guidelines and rubrics were discussed in class and posted on Moodle. Weekly slide presentations were made available before class as a link to GoogleSlides, PowerPoint presentation, or PDF of the PowerPoint. Candidates had the option to simultaneously view the GoogleSlides or PowerPoint presentations with the instructor or print handouts to take notes during class. Candidates in the face-to-face sections had access to Livescribe smart pens for taking notes in class, and the subsequent pencasts were posted on Moodle for all students to access. This allowed candidates to access lecture materials and readings before, during, and after class.

The primary readings for the course were web-based through IRIS Modules (www.iriscenter.com). The modules are designed to maximize access and provided candidates with multiple representation options. All multimedia (video, audio, visual) have captioning, a transcript or alt-text available. Academic vocabulary is hyperlinked to a glossary entry. Patterns and critical features of the text are also highlighted.

To support the academic language of the course, an interactive glossary was available in Moodle to encourage candidates to utilize precise language in class discussions. The interactive glossary functionality in Moodle provides links to glossary terms through the entire course, including assignment guidelines, quizzes, rubrics, etc. Multiple media options were also used to provide alternate modes of access to the course content. As discussed earlier, candidates had access to weekly lecture presentations through GoogleSlides, PowerPoint slides, and PDF handouts. Additionally, GoogleDocs was used as a collaborative medium that could span the divide between the distance learning section and face-to-face section.

Comprehension was supported through an advanced organizer that illustrated the alignment of the weekly instructional objectives to the broad course objectives. Additionally, media and reading assignments were used to supply background knowledge, highlight critical features, and guide information processing. Class activities supported the generalization of theory to practice as candidates learned about UDL and experienced it being modeled by their instructors. Additionally, candidates applied UDL principles to their own curriculum design through small group activities and a major assignment.

Action and Expression

Physical action was supported through a variety of methods. Specifically, group activities involved movement around the physical space that applied active learning principles (Faust & Paulson, 1998). Additionally, instructors used Socrative.com as a formative assessment tool and simultaneous editing in GoogleDocs to facilitate candidate knowledge construction across multiple learning sites.

Candidates were encouraged to submit the weekly group assignment in the format they were most comfortable using, whether it was a word processed document, slide presentation, brochure, or any other online production tool. Additionally, candidates were given the option to demonstrate their knowledge and understanding of course content on the midterm and final exams in one of four ways: 1) selected response, 2) verbal, 3) essay, or 4) web-based project.

Candidate capacity for monitoring progress was assisted by the design of the Moodle course structure. Specifically, candidates had checkboxes to monitor their progress in completing course tasks (see Figure 1).

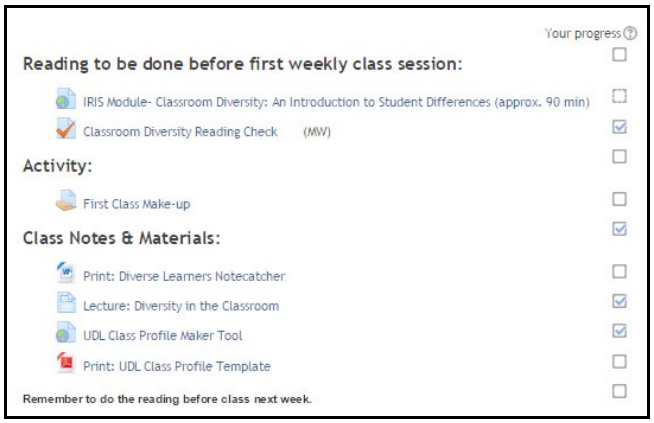

Figure 1. This screen shot from Moodle illustrates how candidates could use check boxes to monitor their progress on class activities and assignments for the semester.

IMPLICATIONS

The instructors designed the course, "Creating Inclusive Classrooms," to teach candidates about UDL Principles, model the UDL Principles, and have them personally experience the potential of UDL as learners. The emerging Pedagogical Implementation of UDL model in Figure 2 illustrates the potential relationship between course content on

UDL, seeing UDL modeled by instructors, personally experiencing UDL, and generalizing UDL into future teaching practice. It is hoped when teacher education candidates first encounter UDL, they will "learn it", "see it", and "live it," as modeled by their instructors. They will then generalize their experience and "do it" in their professional teaching career.

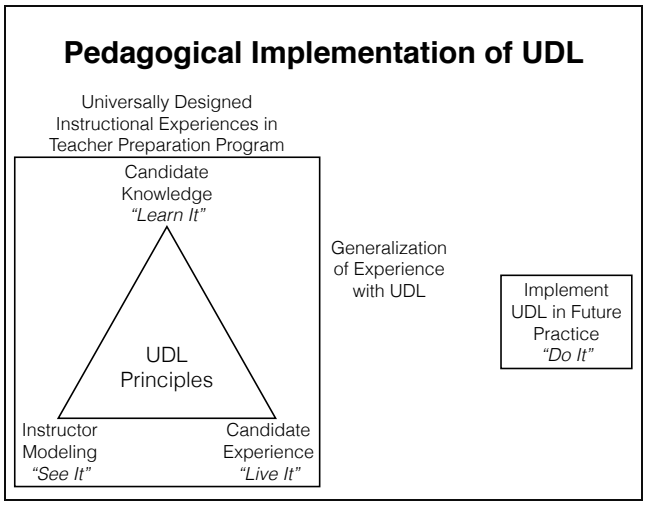

Figure 2. The emerging *Pedagogical Implementation of UDL* model illustrates the potential relationship between how pre-service teachers learn about UDL, see UDL modeled by their instructors, live their experience with UDL as learners, and generalize their experience with UDL into their future practice.

REFLECTIONS FOR FUTURE PRACTICE

As the instructors continue to refine course design and delivery, the primary goal is to support candidates who will apply UDL principles once they themselves become classroom teachers. An area the instructors intend to improve is to encourage candidates in appropriate goal-setting with this end in mind. The intent is to facilitate candidates' understanding of the intentional connections between their learning about UDL, seeing UDL modeled, and their perceptions of UDL principles experienced first-hand.

The course is now offered in a synchronous online learning environment. UDL principles were applied to the course design. A question to investigate is whether candidates can adequately experience UDL online and transfer that learning to a face-to-face setting.

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