UDL Unplugged:
The Role of Technology in UDL

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Table of Contents

Introduction

Many teachers who are attracted to UDL as an idea are unsure whether they can actually implement it in view of their limited access to technology or their limited fluency in its use. This paper examines the question of whether technology is central to the foundations of UDL or whether UDL is useful as a pedagogical framework that goes beyond technology. Based upon a lesson that is familiar to most elementary school teachers, this paper uses the UDL guidelines as a structural framework through which to examine these questions.

Example Lesson: The seed lesson

Goal:
Students will understand and be able to articulate the lifecycle of plants

Lesson activities
- Students explore the way the seeds look, feel, smell or sound.
- Students are provided with magnifying glasses and checklists of features for which they should be looking in order to sort seeds into groups.
- Students record their observations in a journal through words or drawings.
- Students help to label the seeds that they can identify and work together to create a "seed museum" that includes seeds collected at home.
- During reading time, students pick from four different books to read about the lifecycle of plants.
- All students plant their own seeds.
- A wall chart lists the steps of the process in text and in pictures.
- A word wall displays all of the new vocabulary associated with the lesson.
- Students record the progress over the next few weeks in their journals – in words, in drawings, in pictures, in a simple graph or chart.
- If conditions allow, students follow the plants to maturity, harvest their seeds, add them to the museum, and reflect on the full life cycle of plants.

Principle I: Multiple Means of Representation
Guideline 1: Provide options for perception

- The Seed Lesson has a "natural" advantage in "providing options for perception": its information is accessible through multiple sensory modalities. Children can learn about the growth of seeds and plants by looking at them, touching them, tasting them, smelling them, and even perhaps by hearing them.
- The various senses of touch (e.g. shape, size, texture, hardness, temperature, etc.), as well as smell, taste, or hearing (shaking and manipulating the plants or seeds), provide students with options to perceive and acquire information in different ways.

Guideline 2: Provide options for language and symbols

- In order to "provide options that define vocabulary and symbols," vocabulary associated in the Seed Lesson is introduced and embedded in a meaningful activity, rich in a relevant, authentic context. Embedding language development into authentic tasks is much more effective than isolated "vocabulary building" or dictionary look-up exercises.
- Supports such as the classroom "word wall" and student-created dictionaries on vocabulary posters are also effective examples of "providing options that define vocabulary and symbols."
- The Seed Lesson also inherently provides "options that illustrate key concepts non-linguistically." The physical seeds, the plants, and the tools themselves are all "non-linguistic" representations of content from the lesson.

Guideline 3: Provide options for comprehension

- In order to "guide information processing," the teacher develops a checklist to scaffold the information processing of her students. These checklists support students in knowing what features of the plant they should pay attention to.

- The Seed Lesson also "guides information processing" by providing teachers with the opportunity to model strategies and make their thinking visible for their students through the use of modeling and "think alouds."

- The "seed museum" is an example of "providing options to highlight critical features." By engaging in the activities of identifying, comparing, labeling, and sorting seeds, students begin to learn a great deal about categories, relationships and even taxonomies.

Principle II: Multiple Means of Action and Expression

Guideline 4: Provide options for physical action

- "Options for accessing tools and assistive technologies" are illustrated by the use of an array of tools (magnifying glasses, shovels, hoses, watering cans, etc.) in the Seed Lesson. These tools extend human capacity, and UDL reminds us that students with motor disabilities need the same thing. Specially designed versions of hand tools that have "easy grips" or special releases, etc. have been carefully designed augment the capacities of individuals with a wide range of physical abilities.

- The Seed Lesson also offers an opportunity to learn to choose and use tools, not in isolated therapy sessions, but in authentic tasks where students can learn to augment their own capacities in an organized and instructional way.

Guideline 5: Provide options for expressive skills and fluency

The Seed lesson provides "options in the media for expression" by encouraging students to represent and communicate their observations in words, in drawings, in pictures, or in simple graphs or charts.

Scaffolds for practice and support" are also embedded into the lesson:

- The word wall provides both semantic and spelling support for the apprentice writer.

- The checklists designed to help students know what to look for in their observations also double as organizers or "reminders" to structure their writing.

- Teachers can also provide – either directly in student journals or as supplementary guides or templates – many structural supports to help students get started and organize their thoughts: sentence starters, structural templates that break down the writing into sections, concept maps, and so forth.

- Teachers themselves and a student's peers can also provide key scaffolding opportunities.

Guideline 6: Provide options for executive functions

- External scaffolding to "facilitate managing information and resources" is embedded into the classroom: it is organized into distinctive functional areas; there are topic-related charts, diagrams, models, on the walls; and there are schedules and routines on whiteboards or easels.

- The wall charts and diagrams are also examples of "options that facilitate managing information and resources." These supports reduce the working memory load—essentially supplementing internal capacity with external capacity—helping students "hold" the required information while they are learning.

- Graphic organizers and templates for recording information, guidance on note taking, strategies for effective organization methods, and so forth are other examples of "options that facilitate managing information and resources."

Principle III: Multiple Means of Engagement
Guideline 7: Provide options for recruiting interest

- In order to "recruit interest," the Seed Lesson begins with an "attention grabber" —a ripe, colorful, juicy fruit to explore.
- There are inevitably some students, however, who might be hesitant to engage in exploring a messy fruit. In order to vary "threats and distractions," a UDL approach would encourage options: allowing students to watch other students (or the teacher) from a respectful distance, encouraging some students (or their parents) to help prepare for the activity by trying it under less stimulating conditions at home first, providing a template of the activity with pictures or illustrations of the steps to make it more predictable, or providing an opportunity to conduct the exploration in a safe setting.

Guideline 8: Provide options for sustaining effort and persistence

The goal of the Seed Lesson is consistently explicit, constantly available, and "highly "salient":

- Developing plants are highly visible and constant reminders of the primary learning objective.

- If students forget or get distracted by other activities, the plants themselves will begin to wilt, making explicit their requirements for water, sunlight, nutrients.

- Equally important, the plants serve as physical reminders to the students, not only of their need for resources but also of the student's goal to provide them.

Guideline 9: Provide options for self-regulation

- The teacher provides "options for developing self-assessment and reflection" by handing each student a rubric for evaluating their own participation in the collaboration.

- By differentiating the level of the rubric to the student's existing level of performance, the teacher can ensure that every child is sufficiently and appropriately challenged to grow.

Conclusion

We began this paper with a simple question: Can UDL be implemented without modern technology? Our examination of the Seed Lesson illustrates that most or all of the UDL guidelines and benchmarks can be admirably implemented without any particular modern technology at all. What UDL does require, and this is critical, is a well-designed lesson from the start. And a well-designed lesson is one that is constructed to offer sufficient options – in both challenges and supports – so that all of its learners will be successful.