Universal Design Learning (UDL) for Extension Audiences[1]

Vanessa Spero[2]

This publication explains the principles of Universal Design Learning and how to incorporate them into lesson plans. This information is intended for 4-H Extension agents and other professionals who educate youth.

What Is UDL?

Universal Design was first utilized in the architecture community to address the accessibility needs of persons with disabilities. The value of Universal Design was acknowledged later in the educational community. Practitioners found that by adding the domain of learning to Universal Design, to create UDL, they could meet the needs of people with disabilities in learning environments. According to CAST (2024),

> Universal Design for Learning (UDL) is a framework to improve and optimize teaching and learning for all people based on scientific insights into how humans learn… The goal of UDL is learner agency that is purposeful & reflective, resourceful & authentic, strategic & action-oriented.

While UDL was developed for people with disabilities, it is recognized that all learners can benefit from the framework and principles of UDL (Rose, 2000), and studies confirm that UDL is an effective teaching method (Capp, 2017; Evmenova, 2018).

To understand how UD and UDL benefit all populations, take the example of closed captioning. It was originally designed for people who are deaf but has been used by other populations. Closed captioning provides written text with video. People learning English, people in a public setting where the sound may be turned off (such as a gym or restaurant), or children learning to read also benefit from closed captioning. The same thought applies to UDL; while designed for the minority of learners and those with a disability, other learners, if not all, can benefit too.

Educational environments acknowledge that not all learners are on the same cognitive and/or developmental level, which means all learners have the potential to benefit when educators regularly incorporate UDL principles into lessons (Cook & Rao, 2018). Universal Design Learning centers on providing maximum support for learners without losing focus of the intended goals being taught (Rose, 2000). It promotes a proactive approach to address teaching material before the lesson rather than reactively making accommodations and adjustments during or after the lesson (Cook & Rao, 2018; Evmenova, 2018).

Universal Design Learning should be applied in the early stages of curriculum design and before implementation in an educational setting. When designing curriculum and lessons with the UDL framework, learner variability is anticipated and considered the "norm" in educational

settings (Cook & Rao, 2018). By including methods that go above and beyond in providing access to learning materials, learners can continue to gain knowledge and skills through accessible means that work for them (Rose, 2000). This also means that while there may be student learning barriers, learners still possess strengths that UDL can foster.

Universal Design Learning, as a framework, focuses on the principles of engagement, representation, and action/expression (CAST, 2024). Each principle has multiple suggested design options that are further broken down to address access, support, and executive function for learners (CAST, 2024). These principles enforce the idea that lesson material should be taught in multiple formats (called design options) and assessments should be demonstrated through various means (Evmenova, 2018). There are three principles, nine guidelines, and 31 checkpoints/considerations, but no set number required to demonstrate UDL methods (Evmenova, 2018).

In short, the UDL principles can be summarized as the following (CAST, 2024):

- **Engagement**: Offer options that engage students and keep their interest, including those that foster a sense of belonging in the environment; allow sparks to develop; and promote autonomy, independence, and reflection.

- **Representation**: Show the information in different ways to students, maximize the use of accessible materials, clarify language and vocabulary, connect prior knowledge for students, and highlight larger picture relationships and connections.

- **Action and Expression**: Allow students to approach tasks and demonstrate what they learn in different ways through improved interactive methods (including accessible technology) and multiple opportunities to express their individuality and creativity.

Universal Design Learning can seem formidable, but it should not be thought of this way. The most important things to remember are the goal of the lesson, the needs of the anticipated learners, and the barriers to learning currently present in the educational materials. When working with the same group of learners over time, understanding their specific needs and addressing their personal barriers will be easier.

Some ways to implement UDL principles include the following (UF College of Public Health and Health Professions, n.d.):

- Utilize accessible features for curriculum materials.
  - Use software to check for accessibility in color contrast, alternative text for pictures, and so forth.
  - Make sure referenced materials are available through open-access platforms.
  - Provide copies of materials in advance of the lesson. These include a syllabus and outlines for course materials.
  - Design and utilize notetaking templates, create sample assignments of lessons, and/or distribute study guides to assist students.
- Offer multiple methods of design elements.
  - Add auditory, visual, and kinesthetic elements to lesson plans. These include videos, animations, and highlighted text in course materials.
- Include multiple methods of assessment for students.
  - Formal assessments should proceed with multiple methods of feedback from the instructor, such as during class discussion or through personally written or verbal comments.
  - Include various opportunities for students to demonstrate competency through tasks that illustrate their strengths.
  - Formal assessment examples include written assessments (multiple choice, fill in the blank, essay), oral/verbal assessments, artistic expressions (such as a play, drawing, poster, or video), and so forth.
- Support engagement in learning.
  - Incorporate group work with peers to support learning new material and assessing previous material.
  - Allow students to choose their topics of interest.

Learn more about UDL and assist with UDL design at the following resources:

- Center for Applied Special Technology (CAST), Universal Design for Learning
- UF College of Public Health and Health Professions, Academic Integrity, "Utilizing Universal Design Principles"
- UF Information Technology, "Accessible Course Design"
- IRIS Center, Peabody College, Vanderbilt University, Universal Design for Learning

Remember, UDL is about designing a learning environment that meets the needs of all learners. As practitioners, we can support our learners by incorporating UDL principles.

Applying UDL

This section provides an example of evaluating an existing lesson plan for UDL principles to illustrate how practitioners can incorporate engagement, representation, and action and expression into teaching. Keep in mind the goals for any practitioner are to reduce student learning barriers and to address student variability in learning.

Checklists can assist in evaluating curriculum and lesson plans. For this example, two resources were utilized: CAST (2024) and Evmenova (2018). Each can be used as a learning tool to apply UDL principles.

The sample lesson plan is from the Florida 4-H curriculum: Ask IFAS publication 4H368, "4-H Eggcellent Adventures in Classroom Embryology: An Intracurricular Guide to Chicken Embryology" (Spann & Levings, 2015). For this evaluation, the Parts of the Egg (pp. 15–17) lesson was assessed for UDL principles.

Before addressing any specifics for this lesson, one UDL feature that should be added to the curriculum and lesson plans is the appropriate age range for the curriculum. In addition, emphasizing greater use of the chick journal throughout the lesson plans can highlight it as a core engagement and assessment tool for students. The chick journal allows students more flexibility in illustrating what they have learned in a creative, individualistic way that can highlight their strengths. It also provides an opportunity for students to review what they learn as they build on core concepts and increase their knowledge around the topic area of embryology.

For this lesson plan specifically, the objective is for the student to be able to identify and label the parts of an egg upon completion of the activity. The life skills that students will learn are communication and observation. The goal of the lesson is to create opportunities for observation and communication, which supplement the anticipated knowledge gain of the student. A suggestion for the goal of this lesson is to expand upon why students need to learn the parts of the egg and move beyond just labeling into understanding the functions of those parts. This will help students understand embryo development as they continue to participate in the embryology lesson.

The following are recommendations that demonstrate the three UDL principles to enhance the current lesson plan:

Engagement

This principle offers options to engage students and retain their interest in the material being taught. According to Evmenova (2018), students should be given options to recruit interest, sustain effort and persistence, and self-regulate. The following are ways to promote engagement in learners:

- Increase opportunities for students to engage with peers.
  - Allow students to dissect the eggs with a partner or in small groups rather than just being spectators. Add supplies, including gloves, towels, and toothpicks, to make students feel more comfortable.
  - Allow students to work together to complete not only the dissection but also the assessment.
- Have students illustrate the parts of the egg in their chick journal after they learn the information.
- Emphasize the functions of the egg parts through further exploration beyond dissection, such as by dying the egg to illustrate how air passes through its membranes. National Agriculture in the Classroom has an example of this lesson by Wallin (n.d.) called Eggology (Grades 3–5).
- Discuss how the dissection or other parts of the lesson went, how students would share what they learned with their families, and how the material they learned may be useful to understand in their daily lives.

Representation

This principle focuses on showing information in different ways to students. According to Evmenova (2018), students should be provided options to enhance perception, language, mathematical expressions, symbols, and comprehension. The following are ways to promote representation of learning material:

- Address accessibility of the materials.
  - Include additional phonetic spelling to assist with pronunciation of the terms. The example of chalazae (pronounced kuh-LAZE-eye) should be duplicated.
  - Add more visual elements such as animations, posters, pictures, books, and so forth.
- Review key concepts related to the topic before students participate in the lesson.
- Familiarize learners with vocabulary and definitions before the lesson begins. This can be done at the start of the lesson or given as homework the day before. Provide a labeled diagram before the lesson starts and then proceed to give them a blank one after the lesson to fill out as the

assessment. Including vocabulary sheets can also assist students.

- For example, the lesson plan by Wallin (n.d.) contains a vocabulary and definition tool in the beginning.

- Emphasize more than the parts of the egg and add more detail for students to understand the "why" behind the parts of the egg to understand their function. An example of this in the curriculum is when the authors explain that the chalazae is like a seatbelt for the yolk. This example provides representative context for learners to understand the purpose of each egg part and a similar method should be followed for other parts of the egg.

Action and Expression

This principle allows students to approach tasks, demonstrate what they learned, and be assessed in various ways. According to Evmenova (2018), students should be provided options for physical action, expression, communication, and executive functions. The following are ways to promote action and expression in students:

- Offer choices for students to provide assessment data. Some ideas for assessments include changes that can be made to the existing assessment tool or additional assessments that can be offered, remembering students value choosing how they are assessed when given the opportunity.
  - For labeling the egg, allow students to cut out the word bank and paste the answers rather than just writing the answers in.
  - Have students "quiz" each other on their knowledge of the parts.
  - Have students draw their own egg and parts rather than providing the illustration for them.
    - Examples of an assessment tool that asks students to draw the egg and describe its parts are from Illinois' Ag in the Classroom (2022) curriculum: Embryology Exploration. Specifically, the assessment tools on egg anatomy and egg dissection support more opportunities for action and expression.
  - Allow students to represent their knowledge in other ways, such as creating a song with the parts of the egg, creating a play around egg parts, and so forth.

Addressing the framework and principles for UDL provides multiple opportunities to enhance learning and knowledge gain. There are many resources available to assist in the journey of improving how we teach students. As practitioners continue to design, implement, and evaluate curricula and lessons, anticipating and addressing variability in learners is an obligation to enhance the success of students.

References

Capp, M. J. (2017). The effectiveness of universal design for learning: A meta-analysis of literature between 2013 and 2016. *International Journal of Inclusive Education*, *21*(8), 791–807. https://doi.org/10.1080/13603116.2017.1325074

CAST. (2024, December 5). About universal design for learning. https://www.cast.org/resources/about-universal-design-for-learning/

Cook, S. C., & Rao, K. (2018). Systematically applying UDL to effective practices for students with learning disabilities. *Learning Disability Quarterly*, *41*(3), 179–191. https://doi.org/10.1177/0731948717749936

Evmenova, A. (2018). Preparing teachers to use universal design for learning to support diverse learners. *Journal of Online Learning Research*, *4*(2), 147–171. https://www.learntechlib.org/primary/p/181969/

Illinois Agriculture in the Classroom. (2022). *Embryology exploration*. Retrieved on October 28, 2024, from https://www.agintheclassroom.org/poultry/posts/embryology-exploration/

Rose, D. (2000). Universal design for learning. *Journal of Special Education Technology*, *15*(4), 47–51. https://doi.org/10.1177/016264340001500407

Spann, S., & Levings, J. (2015). Eggcellent adventures in classroom embryology: An intracurricular guide to chicken embryology: 4H368/4H368, 11/2015. *EDIS*, *2015*(8), 88. https://doi.org/10.32473/edis-4h368-2015

UF College of Public Health and Health Professions (n.d.) *Utilizing Universal Design Principles*. https://phhp-academic-integrity.sites.medinfo.ufl.edu/course-development/utilizing-universal-design-principles/

Wallin, L. (n.d.). *Eggology (grades 3–5)*. National Agriculture in the Classroom. Retrieved on October 28, 2024, from https://agclassroom.org/matrix/lesson/138/