THE ART AND SCIENCE OF TEACHING:
HOW UDL SUPPORTS INSTRUCTION FOR ALL STUDENTS

Teaching is an art and a science; there is a continuous balance between the two. Neither is easier than the other and both come with challenges and joys. Once seen as two ends of a continuum, when these two pieces intersect, students benefit.

Beginning with the science, the act of teaching is a formal profession. Regardless of whether your role is that of a preprimary teacher or as a teacher in the tertiary education, you have participated in coursework and teaching observation. You have learned theory, observed practice, and had the opportunity to practice prior to taking a teaching position.

While you were practicing your skills, you probably began to sense that the strategies, techniques, or tasks you learned could not always be methodically applied in the classroom. You noticed that there were other influences like how your students responded to you or the information, how you responded to them or the information, or how you interpreted their reactions and responses. And you realized that how you responded to these influences felt more like an art than a science. This is when you realized that teaching is, as David Rose of CAST puts it, "emotional work."

Historically, the emotional part of teaching has been left to the sociologists and philosophers. It was more the art of teaching. The brain sciences, however, have given us new insights into the important role of emotion and how essential it is to the design of our lessons and curriculum. For example, Mary Helen Immordino-Yang is a former teacher who became an affective neuroscientist. Her work shows that the higher-level processing abilities like "reasoning, decision-making, and those processes related to language, reading, and mathematics" that we require our students to gain are deeply linked to emotional functions. If we want a student to understand a story about another person's life, something we consistently ask our students to do when analyzing literature, that student needs to be able to connect to the story both emotionally and cognitively. Emotions and cognitive functioning are undeniably connected, but how do teachers take this information and use it in their classrooms? How do they bring together the art and the science? This is where the universal design for learning (UDL) framework comes into play.

Imagine a table with three columns. This table is the UDL framework. Written at the top of each column are, from left to right, the words: Engagement, Representation, and Action and Expression. These are the principles of UDL. The far left principle is titled Engagement and focuses on the "why" of learning. It directly relates to the affective (emotional) part of learning. The middle principle of Representation focuses on the "what" of learning. It relates to how teachers represent information to learners. The far right principle is Action and Expression and addresses the "how" of learning. It refers to how we allow learners to demonstrate what they know.

Under each of these principles are suggested options to consider when designing lessons and environments. All of these options together create the UDL framework. This framework supports teachers as they design their lessons and environments (i.e., classrooms or wherever learning is taking

place) to be accessible to all learners. It helps teachers take the pieces and parts they know about quality learning and put them all together. For example, learning that emotion is embedded within the learning process is enlightening but not necessarily helpful. That little piece of new knowledge can feel more theoretical than practical until it is understood that this knowledge is embedded within the principle of Engagement. If a teacher uses the framework to design a lesson or environment, that piece of knowledge will become active. Because the entire framework is grounded in research from both the learning and brain sciences, the needs of all students, not the average student, are taken into account.

For a moment, think of the average student. What does that student look like, talk like, think like, sound like, and act like? It's impossible to know because there is no such thing. There is no such thing as the average student and that alters the way lessons and environments are designed.

Dr. Rose and his colleagues at CAST not only brought together the research that underlie the framework, they brought together research that guided them toward the concept of variability. Variability is the term used to describe the diversity of our classrooms. Dr. Rose calls it the "illusory average;" that pretend group of students who have historically been seen as the main group. In reality, each of those students not only vary in how they perceive, interpret, and demonstrate knowledge and skills, they vary based on the context. The context is where the learning takes place, how it is delivered, and even the interpersonal connections occurring within that space.

Understanding the variable needs of all learners sets the tone for inclusion. By designing lessons and environments to take into account the variable needs of all learners, the teacher is no longer planning for a specific groups of students. When the lessons and environment are flexible (i.e., options suggested within the UDL framework are used in the classroom), students with disabilities have more opportunities to be successful. Teachers who design using UDL understand that the way students come to understand knowledge or skills is rarely as important as their ability to demonstrate that knowledge. And by providing the students with options in how they demonstrate that knowledge, more students are able to perform at higher levels.

There are some specific practices associated with UDL that go beyond the scope of this article and include lesson goal development, understanding the essential pieces of lessons, and the selected student outcomes. Another part of UDL implementation is reflection and idea sharing among teachers and other educators. In many cases, the act of teaching occurs in solitary spaces. Professional development, though, is markedly improved through discussion, idea sharing, and joint reflection. Teachers are urged to learn more about these areas as they relate to UDL to create a more thorough understanding of implementation.

Ours is a profession that brings together art and science. The UDL framework is an example of how the field has moved forward in bringing those two ends of the continuum closer together. While some educational philosophers believed emotion was a critical piece of learning, the neurosciences are providing visible proof of the connection. At the same time, these researchers are helping the field of education understand the necessity to provide options and variety when representing information and when assessing student knowledge. That work helps teachers identify strategies and techniques they

already utilize. Those teachers can see where those strategies and techniques sit within the framework and then identify the additional strategies and techniques they might need to bring into their lessons and environments to meet the needs of all variable learners. The more teachers know about the UDL framework and the associated practices, the better they are able to bring together the art and science of teaching within their own practice.

References

CAST. (CAST). (n.d.). *UDL principles and practice.* Retrieved from

http://www.udlcenter.org/resource_library/videos/udlcenter/guidelines#video5

CAST. (CAST). (n.d.). *Acknowledging learner variability.* Retrieved from

http://www.udlcenter.org/resource_library/videos/udlcenter/guidelines_changes

Immordino-Yang, M. H., & Demasio, A. (2007). We think, therefore we learn: The relevance of

affective and social neuroscience to education. *Mind, Brain, and Education 1*(1), 3-10.

Nelson, L. L. (2014). *Design and deliver: Planning and teaching using universal design for*

   learning. Baltimore, MD: Paul H. Brookes Publishing.

Rappolt-Schlichtman, G., Daley, S. G., & Rose, T. (Eds.) (2012). Emotion and cognition are co-

regulated. In G. Rappolt-Schlichtman, S. G. Daley, & T. Rose (Eds.), *A research reader in universal design for learning.* (pp. 57-61). Cambridge, MA: Harvard University Press.

Stateuniversity.com. (n.d.). Belgium – teaching profession. Retrieved from

http://education.stateuniversity.com/pages/156/Belgium-TEACHING-PROFESSION.html