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Universal Design for Learning

A Collaborative Framework for Designing Inclusive Curriculum

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The term *Universal Design for Learning* (UDL) is becoming more widely known nowadays as a viable framework for designing curriculum and instruction at all levels of education. The 2004 reauthorization of Individuals with Disabilities Education Act (IDEA) affirms UDL as an efficient and effective way to provide all students access to curriculum and assessment (Wills, 2008). An increasing number of states and universities across the United States have developed UDL initiatives aimed at supporting schools in the challenging task of meeting diverse needs of all learners. The UDL concept was introduced in the early 90s by the Center for Applied Special Technology (CAST), the leading organization that has played a key role in the dissemination and advancement of knowledge and practice concerning UDL. According to CAST, UDL is "a framework for designing curricula that enable all individuals to gain knowledge, skills, and enthusiasm for learning. UDL provides rich supports for learning and reduces curriculum barriers while maintaining high achievement standards for all" (CAST, 2010).

While UDL is finding its way into classrooms and professional development for educators, it is still a relatively new term which may have yet to hit home for many teachers and administrators. The purpose of this article is to highlight some of the most important aspects of UDL that are helpful for both K-12 teachers and higher education faculty.

Before going in more detail about UDL, it is worth noting that UDL originated from the concept of Universal Design (UD) in the field of architecture. About two decades ago, the concept of UD began to gain international status as an integrated design approach to the creation of functional and convenient products (devices, environments, systems, and processes) that are usable by people with the widest possible range of abilities (Vanderheiden, 2003). Alternate terms associated with UD include Design for All, Inclusive Design, and Accessible Design (Preiser & Ostroff, 2001). At the core of the UD approach is a firm belief that diversity exists in all shapes and throughout the entire lifespan. Diversity is to be embraced and honored. Universal Design is inclusive because it accommodates people of all ages, sizes, and conditions in a way that is not

stigmatizing and benefits all users (Moore, 2001; White & Selfridge, 2008). Adaptive features suitable for a broad range of users are integrated from the beginning to prevent retrofitting and reduce the need for costly design modifications (Erlandson, 2007).

The curb cut is a classic example of Universal Design that is usable by all people such as wheelchair users and parents pushing a baby stroller. Other everyday life examples of environmental Universal Design include ramps; power doors with sensors; ATMs with visual, tactile, and audible feedback; bi-level drinking fountains, and wide gates at subway stations.

Another interesting example of Universal Design is the Sensory Garden in Osaka's Oizumi Ryokuchi Park in Japan. The park invites all visitors, including people who are blind, to enjoy its many recreational opportunities in the garden through the senses of sight, sound, smell, and touch (The Center for Universal Design, 2008). But this garden used to be called *Garden of the Blind* and was designed to appeal specifically to people with vision impairments. Guided by the concept of Universal Design, the old garden was transformed into the new sensory garden with elements—such as water elements and a combination of hard surface walks and retaining walls—that were appealing and accessible to all people. Consequently, the sensory garden became a recreational place in which all people could enjoy and mingle.

### From UD to UDL: Implication for Inclusive Teaching

There is no greater diversity elsewhere than in today's classrooms. Students bring to school heterogeneous academic, social, emotional, and cultural backgrounds. Recent data indicates that over 50 percent of students with disabilities spent 80 percent or more of the school day in general education classrooms (NCES, 2010), and the majority of general education teachers have on average three or four students with disabilities on their caseload (Pugach, 2006). However, the mere physical presence of students with disabilities in general education classrooms does not guarantee equal opportunities to learn (Kavale, 2000). The No Child Left Behind (NCLB) policy puts emphasis on high accountability for all students, including most students who are identified as having disabilities. It aims to ensure equal opportunities for them to progress in the general education curriculum (Nolet & McLaughlin, 2000; Wiggins & McTighe, 2005). The increasing diversity in classrooms requires a curriculum design framework that allows teachers

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to work collaboratively on curriculum alignment for all learners to effectively support their progress in an inclusive context (Hitchcock, Rose, Myer, & Jackson, 2002).

For general and special education teachers, the UDL framework positions them as co-pilots of an airplane, metaphorically. The UDL guidelines allow them to collaboratively navigate through a design process in which they anticipate and overcome barriers for their passengers—students— to ensure a meaningful and enjoyable learning experience. The collaborative UDL process can lead to timely and meaningful instructional decisions as simple as provision in advance of teacher-prepared guide notes for students who have special needs, or incorporation of a computer-supported software program such as SOLO Literacy Suite to support all students in writing with built-in text-to-speech, concept mapping, and word prediction features.

UDL curriculum embraces rich learning goals and achievement standards supported by a range of strategies, technologies, resources, activities, and assessments to meet the needs of diverse learners (Johnston, Beard, & Carpenter, 2006; Rose & Meyer, 2002). Therefore, it takes the joint expertise and insight of all professionals—especially general and special education teachers—to make sure the diverse needs and strengths of students are understood and considered in the curriculum and instruction process.
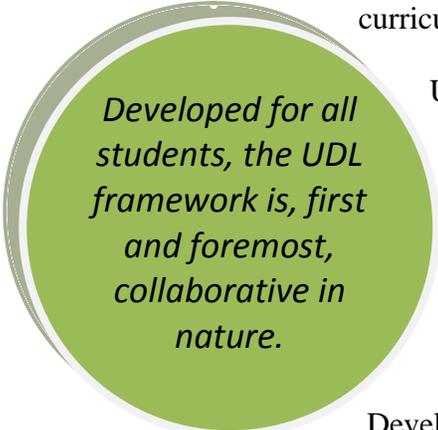
Developed for all students, the UDL framework is, first and foremost, collaborative in nature.

UDL does not represent a fixed set of methods or ways of delivering and organizing instruction. It is a mindset based on the shared understanding that all students can indeed participate in learning in inclusive environments through a curriculum that allows for multiple means of knowledge representation, engagement and action, and expression.

A Collaborative Model for Instructional Planning

Developed for all students, the UDL framework is, first and foremost, collaborative in nature. The UDL framework provides a unified framework for teachers to work as partners to develop flexible pedagogy and tools essential for an accessible and enriching curriculum (Rose & Meyer, 2002). In the remaining spaces, the article will address two questions concerning UDL as a collaborative model:

1) What are the necessary steps in the collaborative process?
2) What are some practical guidelines for general and special education teachers working together to construct UDL classrooms?

The flow chart in Figure 1 is adapted from the collaborative approach to Universal Design used in a collaborative study conducted by the NEC Design Group and Tama Art University in Japan (Ikeda & Takayanagi, 2001, p. 317). The modified chart offers a viable model for collaboration

in the universal design of school curriculum and instruction. This chart incorporates the three basic tenets of the concept of UDL and five fundamental components or iterative steps as guides for collaboration.
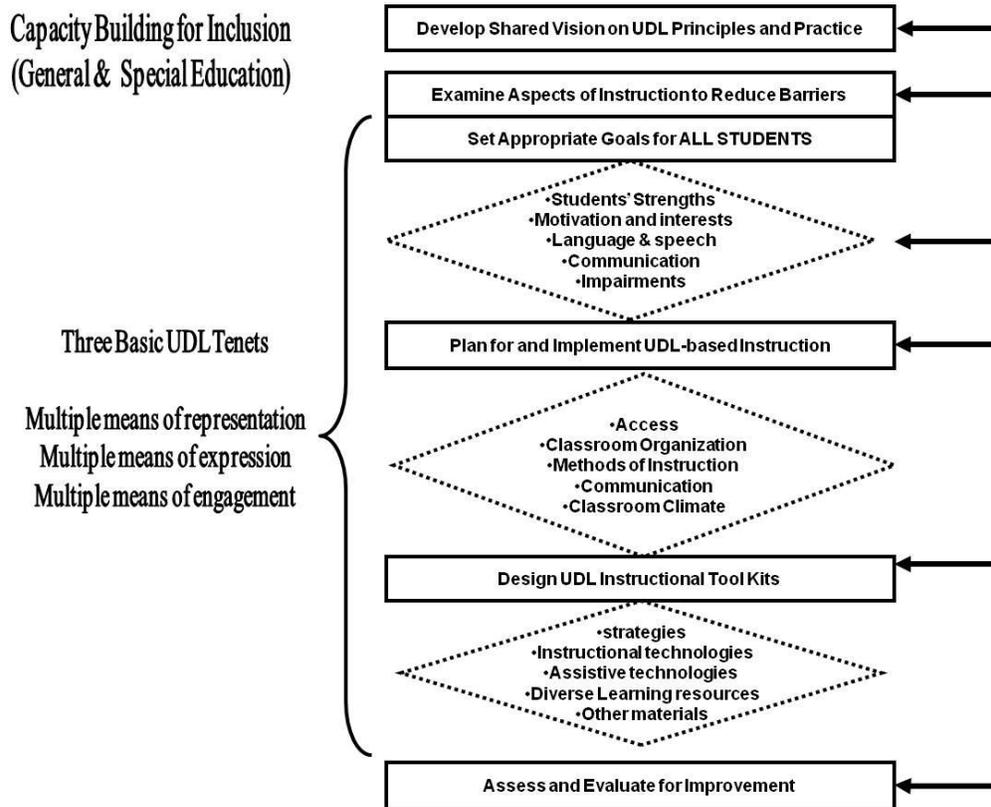

Capacity Building for Inclusion (General & Special Education)

Three Basic UDL Tenets

Multiple means of representation
Multiple means of expression
Multiple means of engagement

- Develop Shared Vision on UDL Principles and Practice
- Examine Aspects of Instruction to Reduce Barriers
- Set Appropriate Goals for ALL STUDENTS
  - •Students' Strengths
  - •Motivation and interests
  - •Language & speech
  - •Communication
  - •Impairments
- Plan for and Implement UDL-based Instruction
  - •Access
  - •Classroom Organization
  - •Methods of Instruction
  - •Communication
  - •Classroom Climate
- Design UDL Instructional Tool Kits
  - •strategies
  - •Instructional technologies
  - •Assistive technologies
  - •Diverse Learning resources
  - •Other materials
- Assess and Evaluate for Improvement

Figure 1. Collaborative Process for UDL Instruction

Studies of educational change and co-teaching show it is critical to build shared vision and common purpose before effective results can occur, especially when a new way of thinking is involved (Fullan, 1993; Friend, 2007; Villa, Thousand, & Nevin, 2008). Thus, the collaboration process should start with vision sharing and active learning about UDL among educators to cultivate a cultural understanding of the framework. This initial step cannot be skipped, though it may be necessary to revisit this issue throughout the curriculum planning and implementation process as teachers continue to reflect upon their practices, attitudes, and expectations for all students.

Next, teachers anticipate potential barriers in a curriculum and assess individual student needs. Using this information about students, teachers compare notes, gather multiple learning resources, fine-tune lessons through joint problem-solving, and evaluate the effectiveness of a myriad of adaptive features in the curriculum.

Teachers work together to set accessible goals aligned with general education learning standards and bring to the consciousness level potential attitudinal barriers related to the teaching of diverse students.

Collaboration may involve people besides teachers and students, such as parents and other school personnel who are part of the students' educational experience. They can provide complementary expertise and information conducive to the establishment of a truly inclusive learning environment. For instance, the sensory garden mentioned earlier was built on the basis of a collaborative process. As many as 500 people with a wide range of abilities were consulted on the features to be included in the park (Miyake, 2001). The participation and involvement of the people with disabilities helped generate indispensible tips at the outset of the design process for building a barrier-free, aesthetically appealing, and functional sensory garden for all.

Component #1: Develop Shared Vision on UDL Principles and Practice

The UDL collaboration process starts with building shared vision on the UDL concept and principles by both general and special educators. This step helps to initiate and foster goal-setting, ongoing conversations, and capacity-building for inclusive teaching. At this stage, teachers compare notes about their perceptions, beliefs, and existing practices regarding diverse learners. Teachers work together to set accessible goals aligned with general education learning standards and bring to the consciousness level potential attitudinal barriers related to the teaching of diverse students. The priority of collaboration at this stage is for special and general education professionals to reach a common understanding of what it entails for implementing UDL for all students, regardless of disability and levels of performance.

Component #2: Examine Aspects of Instruction to Reduce Barriers and Develop Flexible Goals for All Students

The second component in the collaboration model requires teachers to take two proactive steps towards UDL: examine aspects of instruction to reduce barriers, and develop appropriately challenging lesson goals for all students. In order to fully anticipate potential learning barriers in the curriculum, UDL-minded teachers use a variety of assessment tools to gather data about students' strengths, sources of motivations and interests, present levels of performances, and other pertinent information about each individual student and also the preexisting instructional

environment that may either foster or impede their successful participation in the general education curriculum.

Crafting flexible UDL lesson goals means that teachers apply the UDL tenets of multiple means of representation, expression, and engagement and action to create challenging curriculum goals and support the achievement of these goals by all learners (OSEP, 2006). These goals should be clearly defined and flexible rather than vague and rigid (Meo, 2008). The goal statements embody big ideas that serve as effective anchors for lessons and provide room for students to explore, investigate, and get to the heart of understanding of a subject (Wiggins & McTighe, 2005). Collaborative teachers should identify important lesson goals that are too specific to limit the possible pathways for reaching them. For example, rather than asking the whole fourth-grade class to demonstrate the one-size-fits-all lesson goal of "being able to write down the names of the southwest region of the United States," the teacher could make the goal less limiting by changing it into "being able to demonstrate understanding of the southwest region of the United States by one of the following options: a) indicate the southwest region states on the U.S. map, b) verbally name the states, c) draw a map that has the states in the southwest region…" In this way, the classroom teacher uses UDL to develop flexible lesson goals for all learners.

This second component in the collaborative model entails ongoing communication among teachers and often other relevant players who bring unique insights about each student. By working together as a team, general and special education teachers share and build knowledge about how students recognize patterns of information, activate strategies, and respond to a learning experience—three areas of learning corresponding to the three brain networks: recognition, strategic, and affective (Rose & Meyer, 2002; Wolfe, 2001). They then use this knowledge to embed adaptive features in the curriculum designed for students exhibiting a range of needs and characteristics.

Component #3: Plan for and Implement UDL-Based Instruction

At the third stage of collaboration, teachers plan for the implementation of the UDL-based curriculum. The key principles of UDL and corresponding guidelines for practical implementation of UDL in classroom settings are displayed in Table 1. The ideas target teachers involved in the collaborative process of teaching and were adapted from the work by McGuire, Scott, and Shaw (2006) and the Disabilities, Opportunities, Internetworking, and Technology (DO-IT) Center at the University of Washington (2007). Five major areas for consideration in the design of curriculum and instruction are laid out in the table: access, classroom organization, methods of instruction, communication, and climate. Practical guidelines for developing optimal plans according to the relevant UDL principles in these areas are delineated.

Table 1
UDL Principles Matched with Instructional Guidelines (Adapted from McGuire et al., 2006 and DO-IT, 2007)

	Key Principles	**Instructional Guidelines**
Access	*Equitable use*	The curriculum: • is challenging to all my students with diverse abilities and disabilities • learning based on big ideas • uses a variety of tools that provide access to content learning by all learners • provides flexible and accessible class materials, notes, and other information sources to all students • provides alternative ways to evaluate students' progress • provides accessible ways for knowledge demonstration
Classroom Organization	*Low physical effort* *Size and space for approach and use* *Physical access, usability, and safety*	The classroom is arranged to: • ensure that instruction is designed to allow maximum attention to learning with a minimum of fatigue • provide appropriate size and space for approach, reach, manipulations, and use regardless of a student's body size, posture, mobility, and communication needs • assure that activities, materials, and equipment are physically accessible to and usable by all students and that all potential student characteristics are addressed in safety considerations • provide optimal seating for students with special needs in physical and cognitive areas • provide optimal lighting and sensory stimuli • have a clear physical structure

Methods of Instruction	*Perceptible information* *Tolerance for error* *Feedback* *Delivery methods* *Flexibility in use* *Accommodation*	The design: • facilitates effective communication of information to students, regardless of their sensory disabilities or preferences • anticipates and adapts to the variation in individual student learning pace and prerequisite skills • provides specific feedback on a regular basis • uses multiple and accessible instructional methods • provides choice in methods of use and modes of presentation • plans for accommodations for students for whom the instructional design does not meet their needs
Communication	*Simple and intuitive* *Interaction* *A community of learners*	The teacher: • gives straightforward and predictable instructions • sets clear learning goals • explains concepts through verbal, nonverbal, visual, and technological means • communicates expectations explicitly to students • facilitates opportunities for rich discussions and student input • models and encourages effective interactions between all members of the classroom • assures that communication methods are accessible to all participants
Classroom Climate	*Instructional climate* *Class climate*	The classroom atmosphere: • is welcoming and inclusive • exudes high expectations for all students • advances practices that reflects high values with respect to both diversity and inclusiveness

Component #4: Design UDL Instructional Tool Kits

The fourth component involves teachers building instructional tool kits consisted of diverse instructional and assistive technologies, learning resources, methods, and strategies for teaching.

Teachers identify a variety of resources and tools (e.g., electronic media, print text matched to different reading levels and interests, multimedia learning programs, books on tape, and so on) to support students with diverse learning profiles. To the maximum extent possible, instructional and assistive technologies are selected with inherent flexibility to allow further customization by teachers and students. For example, many computer-based software programs provide options for teachers to customize the levels of tasks, the ways students are engaged in learning, and the ways they receive feedback.

Variety, choice, and flexibility are factors to consider in the selection of tools. Assistive technologies, when appropriately chosen and implemented by a team of professionals, can enable and enhance the participation of students in many activities they otherwise cannot access—speaking, writing, listening, seeing, moving about, and navigating computers (King, 1999). When selecting assistive technologies for the UDL tool kit, the team considers technologies on a spectrum from no-tech, low-tech, to high-tech. Examples of these options are: predictable books, use of pictures with text, raised line papers, writing templates, talking electronic dictionaries, books on tape, electronic organizers, multimedia software, word prediction software, and so on (Reed, 2007).

CAST has developed resources and products sections, listing some useful software programs for enhancing all students' equal participation and performance in the general education curriculum. Among the tools listed on the website are text-to-speech technologies (CAST eReader/AspireReader 4.0; ReadPlease), concept mapping software (Inspiration and Kidspiration), a free online tool to enable teachers to develop their own digital books (CAST UDL Book Builder), technology to support instruction and practice in key reading strategies (Thinking Reader by Tom Snyder), and a technology program to scaffold reading and writing (WiggleWorks). Find out more about these products in the following link: http://www.cast.org/products/index.html

Component #5: Assess and Evaluate for Improvement

Last but not least, teachers and other school professionals dedicated to the collaborative UDL model engage in continual assessment and evaluation of the model. This means to retrace, reflect, and revamp each component in the model in order to refine all participants' understanding and enactment of the UDL framework. Effective inclusion demands responsive curriculum design and instruction supported by rich opportunities for teachers to actively learn, reflect, and integrate new knowledge into their practices (McLeskey & Waldron, 2000).

What each teacher can bring back to the collaborative team at this stage is his or her reflections about areas in need for improvement, further inquiry, and more professional development. After each teaching cycle, it benefits teachers to do this type of self-assessment for several reasons: it encourages reflexivity in teaching; it allows teachers to learn from each other; it brings teachers'

dialogues back to the design process; and it builds a sense of professional community. Artifacts to share in such self-assessment conversations may include a teaching journal, a lesson plan, a video segment of a lesson, student work, and so on.

Finally, teachers evaluate the success of a UDL curriculum by gauging students' achievements through a variety of assessment data. Results from alternative assessments, curriculum-based measurements, as well as standardized tests can be used to reach a balanced interpretation of students' responses to the curriculum supported by UDL principles and practices. Assessing and evaluating the model also involves reflective examination of the way collaborations have been conducted throughout the UDL curriculum design process. This opens up opportunities for general and special education teachers to review the effectiveness of the collaboration procedures that they have followed in designing UDL.

The last component can be a key element in the whole collaborative planning process because it offers teachers a valuable moment to debrief, take stock, refine UDL features and ways of collaboration in the curriculum, and generate new knowledge for the next cycle of teaching.

Conclusion

This paper explores the conceptual and practical implications of the concept of Universal Design for Learning. The main thrust of the discussion is the importance of using UDL as a collaboration model for curriculum design and instruction for inclusive classrooms. Central to the framework is the shared vision that general and special education teachers have a key role to play in constructing inclusive and meaningful learning environments for all students through multiple means of knowledge presentation, engagement in learning and action, and expression. This vision can only be translated into practice when teachers cross the departmental or curriculum bridges between special and general education and truly collaborate to design many-sizes-for-all UDL-based curricula. The proposed UDL collaboration model can be useful in promoting a sense of ownership for all students among general education teachers and mobilizing joint efforts across departments.

Central to the framework is the shared vision that general and special education teachers have a key role to play in constructing inclusive and meaningful learning environments for all students through multiple means of knowledge presentation, engagement in learning and action, and expression.

The long-term goal of the collaborative process is for teachers to expand capacity for teaching the widest range of diverse learners in a given setting. Eventually, through collaborative work

situated in daily teaching, teachers' expertise would converge. In the current inclusion movement, that means general education and special education teachers would themselves have access to a more inclusive teaching environment and to opportunities that allow them to plan, design, and problem solve together. By applying UDL principles, general and special education teachers can work together in the following ways: anticipating possible barriers, setting up flexible goals, adopting diverse instructional methods, using a consistent classroom management system, integrating a range of low- and high-tech technological solutions and media sources, providing positive teacher-teacher and teacher-student communication, and creating an empathetic classroom climate. More importantly, they all grow to see the benefits of embracing and sharing ownership for diverse learners who are included in general education classrooms. Without collaboration, UDL and inclusive teaching would be compromised.

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