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Teaching For Diversity: Universal Design For Learning

While university is challenging for every student, some learners find the difficulties nearly insurmountable. International students from non-English speaking backgrounds have difficulty understanding what their teachers are saying. Mature-aged students struggle to maintain energy levels while balancing study, family, and work. Students with learning disabilities are confused by lengthy and complex readings. Students with sensory impairments such as blindness and deafness find many online resources inaccessible. There are as many more examples as there are students of diversity.

There are at least two ways of looking at the overall approach to teaching diverse students. One way is to try to fix the students, by providing remedial instruction and intensive supports (individual approach). The other way is to design the content and teaching approaches to attempt to meet the needs of as many students as possible (environmental approach). The environmental approach has come to be known as universal design for learning (UDL), and education technology is a key component.

The definition of UDL is the proactive design of teaching and curriculum "to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design" http://www.ncsu.edu/dso/general/universal-design.html. The analogy most commonly linked to UDL is that of the electronic curb-cut. Curb-cuts are the portion of the footpath that are cut away and/or sloping so that footpaths are level with the road. Curb-cuts were designed for people in wheelchairs to enable access from the road to the footpath and vice versa. There are not a lot of people in wheelchairs regularly using each and every curb-cut; each curb-cut, however, is regularly used. Curb-cuts outside supermarkets are regularly used by shoppers pushing trolleys. Other curb-cuts come in handy for people pushing prams, for skateboarders, and cyclists. The curb-cut is an example of a design that was put into place for someone with a disabling condition, and found to have benefits for many.

Technology adds the element of electronic to the metaphoric curb-cut. Digital technologies are flexible and can therefore be manipulated to meet many needs. The textbook, for example, is made of atoms, which are fixed in time and space. The reader has to be able to see in order to read the print book. Neon highlights are there for the life of the book. Books lend themselves most readily to being read from cover to cover. Enhanced e-texts, on the other hand, can be altered and restored. Students can insert bookmarks and jump to them. Clicking on a difficult term takes the reader to a glossary definition. Digital highlights can be removed for the next reader. Students with visual impairments, learning disabilities, or tired eyes can listen to an electronic voice reading the book and/or enlarge and change the font. Just by assigning an electronic book rather than a print edition, teachers are already implementing UDL.

There are three main principles of UDL. They are multiple means of representation, engagement, and expression. This table explains each principle and provides a practical example of how progressive educators from preparatory to higher education are using education technology to teach through UDL.

1. Universal design in education is fundamentally different from universal design in the built environment.

Universal design for learning (UDL) was an application of the architectural concept of universal design (UD). An example of UD is

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the bench-top that can be moved up and down by a lever so that users in wheelchairs and tall cooks can all use it. This proposition means that the complexity of constructing understanding is different from building houses following a blueprint, and that we should not over-simplify.

2. UDL is fundamentally about proactively valuing diversity.

Similar to the point above, this means that there are no quick fixes when teaching to a group of diverse learners. Edyburn wrote, "UDL is more than simply integrating the latest technology tools into the curriculum" (2010: 36). While emerging technologies enable capacity for multiple means of representation, engagement and demonstration, inclusion of multimedia does not guarantee learning. Poorly designed technological insertion can be distraction rather than pedagogy.

3. UDL is ultimately about design.

It is important that educators do not confuse design with technology. Design basically means problem solving. Sometimes problems can be solved by introducing technologies into the plan. The key is that design comes before a project. Solutions are proactive rather than retro-fitted.

At this point in the presentation of Edyburn's propositions, the reader might be thinking that perhaps UDL is just a catch-phrase for good teaching. Edyburn disagrees, and his fourth proposition is in fact that:

4 Universal design for learning is not just good teaching.

Educators might have experienced success with typical students through applying pedagogical principles of giving immediate and specific feedback and periodically confirming understanding. However, mature learners with families and careers, students with emotional and behavioural disorders, and people with sensory impairments need more from the educator and the education in order to learn.

Principle	Practical Strategy
1. Multiple means of representation. This means that educators use text, voice, images, metaphors, demonstrations and other ways of getting their message across to students.	Many educators use mobile devices such as iPads, smartphones and laptops in their teaching. The educators pose challenging questions, and the students search for information to inform their responses. As part of the lesson, the students listen to podcasts and watch video demonstrations.
2. Multiple means of engagement. In other words, educators motivate their students through reinforcement, feedback, intellectual stimulation, and other ways of helping students take responsibility for their learning.	Some educators are finding that their students are more likely to engage when they are given the option to participate online. Introverted personalities, peer pressure, and pronunciation challenges can make students reluctant to participate on-the-spot in class. Posting online gives them time to research and revise and adds an element of anonymity.
3. Multiple means of expression. Whereas representation stands for what the teacher does, expression includes assignments, assessment, and other ways that students have of demonstrating their learning.	Students are sometimes prevented from demonstrating their learning because they perform poorly in the assessment set by the educator. An example is test anxiety. Many educators now define the learning objectives through a rubric, and allow the students to decide whether they will create a podcast, slideshow, video, website, or other means of demonstrating their understanding.

5. Universal design for learning does not occur naturally.

UDL must be intentional, researched, and rigorous. Educators will find that they get better through time and practice at designing with a UDL lens.

6. Technology is essential for implementing UDL.

Inclusion of technology is necessary because the capacities of electronic media enable accessibility and flexibility. However, technology alone is not sufficient, in that the technology must be carefully infused in the context of rigorous pedagogical principles and understanding of diversity.

7. UDL is not assistive technology.

This article started by explaining that there are two approaches to supporting diverse students with particular learning challenges – the individual and the environmental approach. Assistive technology (AT) means tools and software that are brought into the education for students with disabilities, on a case-by-case basis. This is an example of the individual approach. Some of the problems are: other students do not receive the benefit of the technology, the use of technology only by disabled students tends to socially set them apart from the others, and often they are physically set-apart from other students because only a computer in the library or laboratory is equipped with the AT, meaning that the student must leave the classroom to use it. UDL on the other hand, is designed to benefit all students together.

8. It is necessary to measure the primary and secondary impact of UDL.

There is a rich and important relationship between research and practice. Both are necessary to inform the other. To date, UDL has been minimally researched, and educators are therefore under-informed as to evidence-based implementation.

9. Claims of UDL must be evaluated on the basis of enhanced student performance.

Hand-in-hand with the eighth proposition, Edyburn is calling for rigorous empirical research on UDL that establishes whether this educational design is making a difference to student learning.

10. UDL is much more complex than we originally thought.

This proposition needs no further elaboration, beyond that articulated in the propositions that came before it.

UDL In Practice

Here are two actual examples of UDL, one from primary school, and one from university.

A primary school teacher had a year two/three class. She started wearing an FM system for a year three hearing-impaired student. The system not only amplified her voice for the hearing-impaired student, but for the entire group through speakers at the back of the classroom. The next year, the hearing impaired student moved on to year four in another class and the teacher stopped using the FM system. The year three students, who had the teacher the previous year for year two, complained that they could not hear the teacher as well as they could the year before. The teacher started using the FM system again and has used it ever since.

A university lecturer was teaching cultural values. He anticipated lively discussion and debate because this year he had students from more diverse cultures than ever before. Week after week, his questions were greeted with silence and he left disappointed and frustrated. A colleague gave him the advice of using an online discussion forum to complement what he was doing in class. Immediately upon making this tool live, the discussion flourished. There was lively debate and opposing positions expressed. Curious, he interviewed students as to why they were willing to engage online, but not in class. He received various responses. Some explained that it was too intimidating to share such personal opinions and experiences live and face-to-face. Many shared that they were afraid of offending one another in the class and that an online forum allowed them to change their wording until they got it just right. The lecturer now includes online forums as part of the learning experience in all of his subjects.

If you would like to read more about UDL, here are some recommended books, articles and websites:

Books And Articles

Burgstahler, S.E. & Cory, R.C. (Eds.) (2008). Universal design in higher education. Cambridge, MA: Harvard Education.

Edyburn, D.L. (2010). Would you recognize universal design for learning if you saw it? Ten propositions for new directions for the second decade of UDL. Learning Disability Quarterly, 33, 33-41.

Rose, D.H. & Meyer, A. (Eds.) (2006). A practical reader in universal design for learning. Cambridge, MA: Harvard Education.

Rose, D.H. & Meyer, A. (2002). Teaching every student in the digital age: Universal design for learning. Alexandria, VA: Association for Supervision and Curriculum Development.

Rose, D.H., Meyer, A. & Hitchcock, C. (Eds.) (2005). The universally designed classroom: Accessible curriculum and digital technologies. Cambridge, MA: Harvard Education

Websites

Electronic curb-cuts CAS (Center for an Accessible Society), Steve Jacobs
http://www.accessiblesociety.org/topics/technology/eleccurbcut.htm

Practical implementation strategy for UDL
Edyburn (2009) Tic-Tac-Toe Instructional Planning
http://www.uwm.edu/~edyburn/tictactoe.html

Universal design for learning
CAST (Center for Applied Special Technology)
http://www.cast.org

History and principles of UD and UDL
NCSU-DSO (North Carolina State University, Disability Studies Office)
http://www.ncsu.edu/dso/general/universal-design.html

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