Universal design for learning

- UDL has been here for 20 years now
  - Was originally formulated to help unsure the effective inclusion of students with disabilities and diverse learning needs and now is a framework to address the variety of all learners
- UDL promotes:
  - Multiple means of engaging students, representing information, and demonstrations of mastery
- There are many primary issues that come with online learning"
  - The variability of students and their learning abilities/disabilities (language, culture, learning experience)
  - Elementary and secondary student's with higher levels of variability in online learning are less successful in online
  - Online curricula including goals, assessments, methods, and materials designed for a hypothetical "average" student are often insufficient to address the variability of today's learners.
  - • On a whole, online learning can provide an efficient and effective vehicle for individualizing learning trajectories, based on real-time student progress data, that leads to student-centered decision-making.
  - • Online learning offers unique affordances for supporting and extending UDL aligned implementation practices.

UDL: "a scientifically valid framework for guiding educational practice that-(A) provides flexibility in the ways information is presented, in the ways students respond or demonstrate knowledge and skills, and in the ways students are engaged; and (B) reduces barriers in instruction, provides appropriate accommodations, supports, and challenges, and maintains high achievement expectations for all students, including students with disabilities and students who are limited English proficient"

Learner variability: Neuro scientists research acknowledges three dimensions of systematic variability that exist in every learner at every age
1. Difference in terms of the way they represent information
2. Difference in the way that they engage with media and material
3. Differences in the way they can act and demonstrate what they know

Personalized Learning: According to Patrick, Kennedy, and Powell (2013), personalized learning means tailoring learning for each learner's interest, strengths, and needs. This approach encourages flexibility to support mastery and enables learners to influence how, what, when, and where they learn. Personalization is also generally associated with three key operational factors that make customizing instruction at the individual student level both possible and practical: 1) real-time student progress data provided by networked learning management systems which provide and record 2) flexible opportunities for students to acquire and demonstrate 3) competencies or proficiencies.

Blended learning: As defined by Christensen, Horn, and Staker (2013) blended learning is a formal education practice where students learn, in part, through online learning with some learner control over time, path, pace, or place. At least some of the learning takes place in a school-based, brick-and-mortar setting.

Supplemental online courses: Enrollment in an online learning environment to supplement another primary learning environment. For instance, when students are in enrolled in a French class online because their local school only offers Spanish.

Competency/proficiency-based learning: Within in this curricular structure, students progress based on mastery of successive goals. Students are often grouped by age and/or proficiencies rather than by grade level, and movement through a course of study is based on demonstrated skill or knowledge achievement, not seat time (Patrick et al., 2013).

Digital delivery systems: Content management or learning management systems (CMS/LMS) provide access to digital curriculum materials and learning interactions for student use. Most of these systems require an individual student login via username/password or unique student identification number, and record and display real-time student usage and achievement data.

Digital learning: Use of digital technology to support learning. This term is context free to specific digital technology, environment, pedagogy, instructional design, and learner interaction with the material or environment.

Research syntheses who's online?

- 2.2 million students take supplemental online course
  - The Growing Diversity in Today's Classroom, Digital Promise reports that given the historical Trajectories from 1973 to 2014 (based on US Census Bureau), say that the classroom has undergone a dramatic transformational increase in diversity and the number of students who present learning challenges
  - A 2015 report from the State Charter Schools Commission of Georgia noted that white students made up nearly 75% of the current online
  - The authors noted an expected increase in traditionally marginalized populations within online settings.
- 70% of students in virtual schools were white, less than 25% Hispanic, approximately 13% Black, 2% or less Asian and approximately 1% Native American.
  - They also found that students with disabilities comprised 7.2% of enrollees in the Huerta study, and 11% in the Woodworth analysis with English Language Learners (ELLs) representing 1% or less in both studies.
  - Interestingly, both studies reported that students at or below the poverty level comprised 45% to 48% respectively of all enrollments, compared to 35% in brick and mortar settings.
- Overall, the field of online learning is seeing an increase in diversity and variability of learners in K-12 online learning spaces. Unfortunately, not all online learning spaces have been designed for these diverse learners. As will be discussed later, UDL provides a research-based framework for designing online learning environments.

How are they doing

- The impact of full-time virtual schooling has been found to be more negative for students in poverty, ELLs, and students with disabilities than the achievement of comparable students in brick and mortar schools or the achievement of students not in these demographic groups
- The Woodworth study documented that the overall academic achievement of two-thirds of students in online charter schools was weaker than that of their peers in brick and mortar settings.
- *"As with students in poverty, students who are English language learners tend to progress academically more slowly than students whose primary*

language is English. This is potentially even more of an issue in an online setting where students typically rely more heavily on reading as the primary method of curriculum delivery" (p.29).

- *Clearly the practice of K-12 education, in general, and the growing presence of online learning need to become more effective in supporting the strengths and addressing the weaknesses of the students for whom they are responsible.*

UDL: "a scientifically valid conceptual framework for guiding educational practice that provides flexibility in the ways information is presented, in the ways students respond or demonstrate knowledge and skills, and in the ways students are engaged"

- Its three core principles – multiple means of engagement (in the ways to support the affective state and motivational connection to learning) multiple means of action and expression (in the ways that we organize and execute strategies and actions through executive and motor cortices that occupy the frontal lobes), and multiple means of representing information (representation in the ways that we sense and perceive information through "recognition" networks that occupy the posterior regions of the brain)
- Are meant to proactively address the academic, social, and cultural distinctions that exist in today's schools.

Research Base for the Foundation & Principles of UDL

- The foundational research in cognitive neuroscience, cognitive science, affective science, and other learning sciences is critical in articulating the range of what learning is, and the range of individual differences in learning.

| An Exploratory Study of Universal Design for Teaching Chemistry to Students With and Without Disabilities (Kings-Sears et al, 2014) | 141 10th graders, 39 students with LD. | 10th grade students in four co-taught high school chemistry classes were randomly assigned to a Universal Design for Learning (UDL) treatment or a comparison condition. Each co-teaching team taught one comparison and treatment class. UDL principles were operationalized for treatment: (a) a self-management strategy (using a mnemonic, IDEAS) for the multi-step mole conversion process; (b) multi-media lessons with narration, visuals, and animations; (c) procedural facilitators with IDEAS for conversion support; and (d) student workbooks mirroring video content and containing scaffolded practice problems. There were no significant differences between conditions; however, there was an interaction effect between students with and without disabilities for post-tests. |

Design principle for indigenous learning spaces:

we have identified what we believe are a series of design principles that can be of value in building or facilitating learning spaces:

- Design Principle 1: A space young people control
  - Importantly, these are sites where Aboriginal people, especially young people, feel a sense of spatial control.
  - It is in these locations that young adults not only have access to resources that enable, as we discuss below, 'learning by mucking around', but also input from mentor experts to expand the development of specialised expertise.
  - Having access to even the smallest power over technology may increase a sense of confidence that extends to enacting decisions elated to difficult situations in everyday life.
  - In this process there is freedom for individual specialisations to emerge and individuals are setting and attaining high level skill and other goals for themselves.
- Design Principle 2: A space for hanging out and 'mucking around'
  - "The digital bedroom" is one of the most vibrant kids of digital learning spaces for youth
  - Informal learning spaces such as media centres, youth centres and libraries perform an important function as "communal digital bedrooms"
  - Access to what have been termed the 'new generation media centres' in remote communities is recognised as opening up an important collective learning environment for young people to engage, develop skills, create media and increasingly take on professional and leadership roles in their communities
  - In these spaces 'there is no right or wrong way' for learning or participation and everybody is 'set up to succeed'
  - Young people's access to new technologies and control of digital practices is allowing them to gain control, not only over the production process and editing, but also self-representation.
  - **Learning capacity**: to think for yourself, decide for yourself, you have the power to change that whole scene with the edit. You gain the confidence to make those decisions, to stand strong in what you believe and what you see and what you think is best for yourself and other people. MICAH WENITO
  - In these spaces they are free to 'hang out' and experiment and to share and learn from one another.
- Design Principle 3: A space where learners learn
  - focus on the crucial enabling role played by facilitators or 'expert mentors' in the learning process.
  - Successful outcomes have been attained through collaborations between Indigenous and non-Indigenous people in the learning process
  - These facilitators do not see themselves as 'bosses' but give agency to the young people they are working with
  - They work in a highly collaborative and respectful manner. They show respect for and interest in the language and culture of the learners, favour side by side delivery and do not judge the learners' performance.

- In our research we observed that successful expert mentors invariably facilitated productive learning activities that were project-based, rather than assessment-driven, and built upon a sense of mutual respect,
- Design Principle 4: A space to grow into new roles and responsibilities
  - Provide opportunities for young adults to participate in project-based learning and take on responsible goal-oriented roles.
  - Variety of adult roles that carry real consequences within a situation or organisation, young people take on meaningful roles and responsibilities and the process gives agency to the ideas of the participants.
  - They want to understand what it takes to run the whole thing; they want to do it themselves; they don't want to be bossed around forever. I think that they embrace the responsibility and the literacy and numeracy stuff doesn't seem to faze them.
- Design Principle 5: A space to practice oral and written language
  - importance of youth engagement in collaborative tasks in youth-based organisations for language development.
  - the playing of meaningful roles 'ratchets up language performance' and 'supportive strict adult models who work alongside learners can provide language input that young learners pick up'.
  - It is through situated learning and practice that young people are enculturated into using these more formal registers.
  - An important feature of learning spaces is their capacity to provide a place where adolescents and young adults can 'practice' their learning, including literacy
  - While this may be enabled just by having access to the resources needed for alphabetic or digital literacy activities, in some of the case studies we observed additional literacy support was provided.
  - Best way to learn is to do it, get in there, get your hands dirty, get on there, play with it…
- Design principle 6: A space to express self/cultural identity through multimodal forms
  - in the various research sites for this project young people are experiencing self-directed, creative, meaningful productive activity enabled by access to resources and a sense of spatial control.
  - it is evident that where young people have access to digital resources and technologies they are engaging in new forms of media production to express themselves and their cultures In doing so they are incorporating a range of multimodal literacies (encompassing oral, written, visual, and gestural modes of representation and communication).
  - Multimedia productions provide insights into how Indigenous youth are symbolising and expressing their shared experiences and practices as a generational cohort
  - The visual, creative nature of multimedia work illuminates the cultural practices and symbol structures in image and language that young people are using for identity formation
- Design Principle 7: A space to develop and engage in enterprise

- o In the research sites we found successful economic enterprises generated by youth and the community themselves, often around shared cultural belief systems where both material and 'symbolic' production is valued
- o Indigenous cultural connection is at the core of many enterprise ventures. The cultural values that determine youth aspirations are inclusive of caring for kin and country and transmitting knowledge to the next generation. Where activities are tied to meaningful community projects, we are seeing youth engaging as the mediators and facilitators of cultural productions in collaborative, intergenerational activities that positively affirm their contemporary Indigenous identity.
- Design Principle 8: A space to engage with the world
  - o it is impossible to ignore the reality that for many remote youth a close and meaningful relationship with the traditional past has been maintained.
  - o Through music, theatre, film and various social media, Indigenous youth are engaging with the world. Through these means they showcase their skills and creations and cultures.
  - o Their experience is one in which their own culture is preserved and celebrated, yet they actively and consciously engage with the world in a way their grandparents could never have envisaged.
  - o Festivals provide an opportunity for young people to set their minds to producing music or theatre performances or films. Often this is innovative work that will showcase their skills.
  - o Importantly, all these settings provide a space for young people to express their contemporary Indigenous identity and engage with the world on their own terms

Online learning: Rethinking teachers' 'digital competence' in light of COVID-19

- This article Amplifies the learning design needs for future K-12 digital learning contexts as a result of the covid remote access emergency learning
- COVID-19 has pushed online education and virtual schooling to the forefront of the political agenda
- After young people being taught through google classroom and zoom lessons, it is reasoned – we'll have to seriously consider the prospect of online education taking on a more prominent role as school systems adjust to the post-pandemic world.
- Instead, the online education being deployed by schools during the first half of 2020 is best described as a form of "temporary distance education".
  - o These were emergency measures as teachers, parents and students never expected nor ever wanted to use digital technology to communicate of work
- What teachers, students and parents have been doing over the past few weeks is certainly not comparable with the sophisticated and deliberate forms of online education covered in the research literature

- As such, this is a good time to begin reflecting on the additional forms of "digital competence" that have come to the fore during the ongoing period of COVID-19 remote teaching.
  - Heightened awareness of the inequities implicit in online education
    - Faced with a class of 25 students, each with different household circumstances and commitments, online teachers have quickly learnt not to rely on "one-size-fits-all" assumptions about the type, timing and mode of work
  - Teachers cannot expect students to be doing the same things online at home as they might be reasonable expected to do online at school
    - This raises the need for digitally-flexible approaches that reflect the multi-situated nature of students' learning environments
    - Timings need to be flexible and asynchronous, scheduling needs to be stretched, alternate options need to be available for working offline, and teaching needs to be designed to fit around the complex needs of different students (rather than students all being expected to fit around the teaching).
  - COVID-19 has underscored the fact that technology often fails, and that even the best-planned digital education offerings can fall short of expectations
  - Perhaps the most overwhelming element of the COVID-19 teaching period has been its emotional and fragile nature.
    - This raised the need for teachers to display high levels of digital empathy, care and compassion towards their students.
    - While COVID-19 is clearly an exceptional upheaval, it illustrates the fact that students and teachers are facing all manner of emotional issues at the best of times. Any digital educator working at a distance from their students needs to be sensitive to this.
  - Allied to this need for compassion is the core competency of being able to exercise digital restraint
    - Both teachers and students have quickly found that synchronous video classes and meetings are [mentally exhausting](#) in ways that their face-to-face equivalents are not.
    - Teachers have found that preparing online classes can require much more preparation time and planning, as can dealing with student and parent "feedback".

- Yet, we've reached a point where hundreds of millions of school students, teachers and parents now have first-hand experience of being reliant on digital technology, and a better sense of what qualities and characteristics have made these experiences easier, more engaging and perhaps even more effective.
- In all these senses, COVID-19 has taught us all to value the social, emotional and profoundly relational nature of online education.
- Teachers need to have good awareness of the social, emotional and affective aspects of technology-based education, and feel confident in their capacity to respond appropriately. Teaching of any sort is never simply a technical process – this is certainly the case when teaching online.