Universal Design for Learning for Technology-enabled Post-secondary Courses at Mohawk College

Research Project Report

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Project Overview

Based on the work of Meyer, Rose and Gordon (2014), Mohawk College defines UDL as:

> …a curriculum design, development and delivery framework used to create accessible and inclusive learning environments. UDL guidelines are based on three primary brain networks: Recognition, Strategic and Affective. Each network is then identified by a principle to provide multiple means of representation, action and expression, and engagement. To guide design, development and delivery, in practice, options are outlined for consideration under each principle (Mohawk College, May 2017, Universal Design for Learning Information for Faculty).

Mohawk College has elected to implement UDL for a number of reasons, including:

1. As an educational institution, Mohawk understands that effective learning is impacted by a number of factors including "Conceptions, processes, and interdependence of learning, class climate and social and emotional well-being, as well as academic self-concept and school engagement" (Katz & Sokal, 2016, p. 38).
2. UDL is in line with Mohawk College's strategic mandate and values. Mohawk's values include being "student focused", "committed to excellence" and "inclusive" (Mohawk College, 2016, Strategic Plan). UDL guidelines, by their very nature, are learner focused; promote curriculum design, development and delivery excellence for all learners; and have been developed to promote inclusion.
3. The UDL framework has the capacity to support the Accessibility for Ontarians with Disabilities legislative mandate. Mohawk College has a number of accessibility targets to meet, no later than 2025 (Ontario,

2017) and UDL has the ability to improve accessibility at the course level.

4. As the strong majority of Mohawk College courses are technology-enabled, the infrastructure required to implement UDL is already in place and a natural fit for the institution.

Mohawk College is a "blended learning" institution, meaning that the majority of Mohawk's courses are technology-enabled. "Blended learning" is defined by Mohawk College as:

> Blended learning integrates both face-to-face learning and online learning in the delivery of a course. Most courses at Mohawk are blended.
>
> A blended course is designed to integrate face-to-face and online activities so that they reinforce, elaborate on, and complement one another, instead of treating the online component as an add-on or duplicate of what is taught in the classroom (Mohawk College, n.d., What is Blended Learning?).

Literature Review

The need to implement universal design for learning (UDL) within post-secondary institutions is made clear by Sheryl Burgstahler (2015) in her book *Universal Design in Higher Education: From Principles to Practice*:

> What if there were a paradigm for higher education that simultaneously addressed issues of diversity, equality, accessibility, social integration, and community? What if this approach went beyond the design of more inclusive instruction to provide guidance for making physical spaces, student services, and technology more welcoming to, accessible to, and usable by everyone on campus? The application of UD in higher education can do all this and more (Burgstahler, 2015, p.3).

Burgstahler's findings are supported by Edyburn who states "without a doubt, UDL holds considerable promise" (2010, p. 40). Significant research, including extensive studies by Meyer, Rose and Gordon (2014) has informed Mohawk College's decision and dedication to the implementation of UDL within the college community. Mohawk College is actively working to leverage UDL's promise to create more inclusive and accessible learning environments for a diverse population in a technology-enabled setting.

In order to implement UDL, Mohawk College has committed resources and supports for faculty. However, as Mohawk College has started the UDL implementation process, two critical challenges have been identified:

1. Mohawk College does not have a measurable UDL standard for UDL implementation in technology-enabled courses.
2. Faculty require resources to objectively evaluate their implementation and use of UDL within technology-enabled courses.

The *Universal design for learning for technology-enabled post-secondary courses at Mohawk College* research study aims to determine:

- A UDL standard for Mohawk College's technology-enabled courses.
- A process for UDL implementation.
- A measurement tool for faculty.

The literature review that follows is an attempt to gather current knowledge regarding UDL standards of practice, the implementation processes for faculty, as well as measurement tools for UDL employment within Mohawk College's technology-mediated learning environments.

UDL Standard

Based on the research of Katz and Sokal (2016) a UDL standard for Mohawk College should "promote physical, social, and academic spaces that support meaningful access and function to a range of learners" (p. 41). Furthermore, the literature review from Katz and Sokal's 2016 research study, *Universal design for learning as a bridge to inclusion: A qualitative report of student voices*, found that the majority of current research focuses on students with disabilities, as opposed to the larger post-secondary college community (p.42). The development of a UDL standard for Mohawk College will require consideration of all learners, not just those with disabilities.

Not only will consideration for all learners be essential, but also all learning environments. Al-Azawei, Serenelli and Lundqvist (2016) illustrate this point in their article *Universal Design for Learning (UDL): A content analysis of peer-reviewed journal papers from 2012 to 2015*. Their review of multiple research papers determined that "the advantages of UDL are not restricted to a particular learning mode" (p. 46). Mohawk College has adopted blended learning, meaning all college courses have technology-enabled elements with at least some course material being delivered though the learning management system (LMS). Because Mohawk College courses are

technology-enabled to varying degrees, the UDL standard will need to consider the differences in learning environments (i.e. in-class, online, in labs, etc.) and not be restrictive regarding content delivery using UDL.

Smith's study, *Analysing a college course that adheres to the Universal Design for Learning (UDL) framework*, identifies an instructional model that includes "(1) developing clear goals, (2) considering appropriate methods, (3) selecting a range of means to deliver the material and, (4) designing assessment approaches that are formative in nature and provide ongoing opportunities to monitor progress" (2012, p. 38-39). Smith's research provides a general framework for what a UDL standard should contain. Each of the UDL elements identified by Smith will appear in Mohawk College's UDL standard.

Edyburn (2010) states that "technology is essential for implementing UDL" (p. 38). While I do not fully agree with this assertion, I do believe that technology-enabled courses make providing multiple means of representation, action and expression, as well as engagement significantly easier. Smith (2012) agrees with this perspective by citing the need to use technology to both "engage today's college students", as well as provide additional opportunities for post-secondary students "to interact with the content", communicate and demonstrate knowledge (p. 36). As Mohawk College is a blended learning institution, it is well positioned to take full advantage of the learning technology offered through the LMS. Given the benefits of implementing UDL using technology, technology will be an integral part of the UDL standard at Mohawk College.

Dell, Dell and Blackwell's study (2015), *Applying universal design for learning in online courses: Pedagogical and practical considerations*, provided valuable insights into the requirements of a UDL standard. The Ohio State University study, conducted in 2012, suggested the following elements for a UDL standard:

- "Course instruction, materials, and content to benefit people of all learning styles without adaptation or retrofitting…"
- Design that "provides equal access to learning, not simply equal access to information", and
- "Allows the student to control the method of accessing information while the teacher monitors the learning process and initiates any beneficial methods" (p. 171).

In addition, a UDL standard requires that the learning goals of a course provide not only the appropriate level of academic challenge, but also "that

the assessment is flexible enough to provide accurate, continuous information that helps instructors revise instruction to maximize learning for diverse learners" (Dell, Dell & Blackwell, 2015, p. 172). All four of these elements provide a blueprint for a UDL standard.

Finally, Smith (2012) notes how "the changing knowledge base in the neurosciences will continue to inform how we consider and understand learning…" (p. 52). A UDL standard for Mohawk College will need to take into consideration the flexible, malleable and contextual nature of neuroscience research and ongoing discovery.

Implementation Process

At its heart, "UDL is fundamentally about proactively valuing diversity" (Edyburn, 2010, p. 36). To fully implement UDL, a college-wide culture shift to cherishing diversity needs to occur at Mohawk College. Ideally, this culture shift would occur prior to implementation of a UDL standard. However, it seems ill-advised to wait to provide inclusive and accessible learning environments until a culture shift to fundamentally valuing diversity takes place. Given the current commitment to UDL implementation at Mohawk College, it seems the most practical to provide UDL implementation resources that stress the benefits of diversity, promote the work of early adopters to UDL and using positive implementation experiences to support the culture change we hope to see.

UDL is based in design (Edyburn, 2010, p. 37), meaning that implementation of UDL needs to occur during the design phase of curriculum. While this assertion makes good sense when courses and programs of study are new, it may halt UDL implementation to those teaching existing courses, or who have inherited course content from other faculty. While UDL implementation at Mohawk College needs to heavily support new course and program development, implementation efforts also need to target UDL resource and assessment development.

Dell, Dell and Blackwell (2015) suggest the use of a statement regarding UDL elements in each course (p. 178). There are several locations where learners would benefit from having a UDL statement. Table 1 outlines a location for each statement and why it would be beneficial.

Table 1 – UDL Statements

Location	Benefit

Course Outlines	A general statement regarding the use of UDL in Mohawk College courses would inform all students of UDL implementation.
Course Learning Plans	A course specific UDL statement here would outline the UDL elements employed in the course.
Online Course Homepage	The same learning plan statement could also be offered on each course homepage to provide multiple means to gain the UDL implementation information.
Confidential Academic Accommodation Plans	A general statement on this document would highlight the use of UDL at Mohawk College to reduce individual accommodation needs and highlight UDL elements for students with disabilities to look for in their courses.

Izzo, Murray and Novak's (2008) study provides an insight into the needs and professional development preferences of faculty who are in the process of implementing UDL. Izzo, Murray and Novak found that faculty overwhelmingly want professional development opportunities to better understand UDL principles, practical and technological assistance to implement UDL into their curriculum, and more information and guidance on how to support students with a disability, as well as those students that disclose their disability to faculty before registering with disability services (p. 63-64). In response to these faculty requests, an online learning platform for faulty called FAME was developed and piloted between the years of 2003-2006. FAME consisted of five learning modules focused around the accommodations process, rights and responsibilities, UDL, and course web design. The results of the FAME pilot project indicated strong responses from faculty that the training had enhanced their understanding of UDL principles and increased their level of comfort supporting students with disabilities in their courses (Izzo et al., 2008, p. 65-67). UDL cannot be implemented without concerted effort to provide professional development opportunities for faculty. Given the technology-enabled nature of all Mohawk College courses, professional development will need to extend beyond just the fundamental elements of UDL and its implementation, but also to the functionality of the college's LMS.

Schelly, Davies and Spooner (2011) indicate the need for student education regarding UDL to also be included in implementation efforts. Their study *student perceptions of faculty implementation of universal design for learning* noted a gap in the empirical evidence of UDL benefits, and thus, established a research project to determine the effectiveness of UDL

implementation, the technology used to support implementation and faculty training (p. 18-19). The results of their study revealed student perceptions that their learning had been greatly enhanced following faculty UDL training. The students reported that course materials had been offered in a variety of formats, key concepts were emphasized in lecture and multimedia presentations, and instructor feedback was provided more promptly (Schelly et al., 2011, p. 23-24).

Of particular interest, Schelly, Davies and Spooner noted that faculty discussions during training sessions allowed for the sharing of ideas which ultimately meant that UDL concepts could be implemented with less difficulty (Schelly et al., 2011, p. 25). The creation of 'communities of practice', to encourage the sharing of UDL ideas and initiatives at Mohawk College, would be ideal.

Measurement Tool(s)

Al-Azawei, Serenelli and Lundqvist's (2016) study state "that the implications of UDL are not limited to a particular discipline" and that "positive impacts were observed in different disciplines" (p. 45). Given the flexible nature of UDL guidelines and its central principle of learner variability, measurement tools need to exist that are flexible and reflect learner variances and the wide variety of potential disciplines.

The *Universal design for learning for technology-enabled post-secondary courses at Mohawk College* research project will support the reflective nature of UDL implementation that is required. Smith (2012) states that "Educators that engage in reflective practice expand opportunities to enrich their teaching" (p. 36). As UDL "underscores the importance of reflective educational practice" the measurement tool(s) developed should encourage faculty to reflect on their UDL implementation practices (p. 37).

When making design considerations regarding UDL measurement tools it is important to determine who is responsible for implementing UDL and measuring its outcomes. Flagg-Williams and Bokhorst-Heng (2016) believe that while UDL is learner-centered, "it is the responsibility of the institution and the instructors to design their instructional and classroom practices with diversity in mind" (p. 167). Given the institutional responsibilities to provide accommodations to students in Ontario, Flagg-Williams and Bokhorst-Heng's assertion certainly applies to Mohawk College. It is for the institution to provide resources and supports to promote UDL implementation. For faculty, a self-assessment to support them to evaluate their own UDL

implementation and effectiveness within their courses would be an ideal resource to promote UDL growth and ongoing implementation.

Al-Azawei, Serenelli and Lundqvist's (2016) research study identifies that "UDL principles can be used as a comprehensive guideline by educationalists as a starting point in developing accessible curricula or for evaluating their current design" (p. 51). Meaning that a tool to measure UDL implementation and use should support every stage of curriculum, including design, development and delivery. In addition, Al-Azawei, Serenelli and Lundqvist outline what they feel is, a measurement gap. They state that the majority of research studies focus on how UDL has been incorporated into the learning environment, as opposed to UDL compliance or explicit data regarding "how many checkpoints in the UDL guideline have been applied" (p. 52). In order to gather this type of data, a measurement tool would need to be based on the UDL guidelines, having each network and/or checkpoint included.

Additional Research Required

Edyburn (2010), Smith's (2012), and Morra and Reynolds' (2010) perspectives, as noted, prompt the need for an audit of the LMS to determine the technology already available to support the implementation of UDL in technology-enabled courses. As Mohawk is a blended learning institution, it is well positioned to implement UDL through the use of the LMS tools.

According to Smith's study (2012), there is a need to identify the most beneficial elements of UDL implementation (p. 51). The measurement tool developed as a result of the *Universal design for learning for technology-enabled post-secondary courses at Mohawk College* study must include the UDL elements deemed most supportive and learner focused as determined by the faculty and students at Mohawk College.

While completing this literature review, as Katz and Sokal (2016) indicate, it was challenging to find research that did not primarily focus on the benefits of UDL for those with disabilities. They cite David Rose's appeal for "greater outcome-based research related to all students" at the UDL Implementation Research Network conference in 2016 (p. 42). Additional research of all Mohawk College stakeholders is required to support appropriate UDL implementation efforts and UDL course assessment.

Learning Management System Audit

Edyburn (2010) notes the need for technology in order to implement UDL (p. 38). While elements of this declaration could be debated in other educational settings, because Mohawk College is a blended learning institution, technology will undoubtedly be a central element of the College's UDL implementation.

UDL implementation at Mohawk College depends, in part, on the capabilities of the LMS. As already indicated, Mohawk College is a blended learning institution, meaning that the majority of Mohawk's courses are technology-enabled. Mohawk College uses the Desire2Learn's Brightspace platform as the primary LMS. The LMS has been rebranded, by Mohawk College, and is called eLearn@Mohawk (eLearn). An audit of eLearn has been completed for this project to determine the LMS capabilities as they relate to UDL implementation.

LMS Data

Table 2 outlines the functionality of eLearn and its application to support UDL implementation and/or accessibility in Mohawk College's technology-enabled courses.

Table 2 – eLearn Functionality and UDL Applications

eLearn Function	UDL and/or Accessibility Application
Font Settings	• The ability for learners to change font size. • The option of the standard font used within the course, or the Open Source Dyslexic Font.

Dialog Setting	• The ability for students to control how secondary windows within eLearn behave (i.e. dialog or pop-up windows).
	  ○ Learners can change modal dialogs to pop-ups if the learner:
	  1. Primarily views eLearn on a small device.
	  2. Primarily views eLearn with the style sheets disabled.
	  3. Uses adaptive technology, such as a screen reader, screen magnifier or text-to-speech software.

HTML Editor Settings	• The ability for learners to turn off the rich text editor and view source options within the HTML editor. ○ The HTML editor has a variety of rich text features that support the use of adaptive technology including screen readers and text-to-speech tools. • The 'accessibility checker' allows faculty or developers authoring in HTML to quickly check for common accessibility features including hierarchical headings, alt tags on images, etc.
Capture@Mohawk (Panopto & Kaltura)	• Panopto has the ability to include machine generated captioning, for free, on any video created or uploaded into Panopto. • Human transcription or captioning can be done by request, for a fee, on any video in Panopto or Kaltura.

Locale and Language Settings	• The ability for learners to change the default system language. Options include:
	  1. English (Canadian)
	  2. English (United Kingdom)
	  3. Mandarin/Chinese

Reading Content	• The ability for learners to disable content tracking making it easier to navigate content if the student is using adaptive technology.

Discussion Default View	• Learners can change the discussions form from grid view to reading view.
	  ○ Grid view allows students to display the course discussion posts in a more traditional view. Within the grid view, learners can choose the 'Default Threading Style' between 'threaded' and 'unthreaded' to determine how much information is shown at one time.
	  ○ Reading view allows students to display discussion posts where the entire text of a post is displayed for all posts.

Text-To-Speech Integrations	• The ability for learners to have documents read to them through the text-to-speech technologies, ReadSpeaker and docReader.
	  ○ ReadSpeaker is a text-to-speech tool for HTML/web documents stored within the 'Manage Files' tool.
	  ○ docReader is a text-to-speech tool for a variety of document types stored within the 'Manage Files' tool and supports 23 different languages. The following is a list of documents supported by docReader:
	  ▪ Apache OpenOffice/LibreOffice Presentation, Open Document Presentation (.odp)
	  ▪ Apache OpenOffice/LibreOffice Spreadsheet, Open Document Spreadsheet (.ods)
	  ▪ Apache OpenOffice/LibreOffice Writer, Open Document Text (.odt)
	  ▪ ePub (.epub)
	  ▪ Microsoft Excel (.xls, .xlsx)
	  ▪ Microsoft PowerPoint (.pps, .ppt, .pptx)
	  ▪ Microsoft Word (.doc, .docx)
	  ▪ Portable Document Format (.pdf)
	  ▪ Rich Text Format (.rtf)

Time Zone	• The ability for students to set their local or preferred time zone. ○ This function will convert calendar, start, end, and due dates within the system to the local or preferred time zone.
Display	• eLearn is scalable and can be viewed on a variety of devices.

Conclusions

As indicated in the literature review for the *Universal design for learning for technology-enabled post-secondary courses at Mohawk College* research project, the LMS plays an important role in developing the UDL standard, implementation process and measurement tool(s). Knowing what eLearn is capable of will impact the development of UDL initiatives for technology-enabled courses, as well as the professional development content required to support implementation.

One of the primary challenges at Mohawk College is having faculty include their course content in the HTML editor. As noted in Table 2, there are a number of benefits to including course material this way, one of the primary ones being the ability to engage the use of ReadSpeaker to listen to text aloud without learners needing additional adaptive technology. However, it is problematic to ensure that all faculty are including content in the HTML editor. It is also a challenge, from a UDL perspective, to offer options regarding course materials if all content is encouraged to be in the HTML editor when Microsoft Word documents may be more accessible. A UDL standard that involves the use of ReadSpeaker and docReader needs to be developed to support reading needs and preferences with the option of including Word documents for learners.

Another recurring issue is the limitation of ReadSpeaker. ReadSpeaker does not work in the Discussion area, in Assignment Dropbox Folders, or in the Quiz tool in eLearn. Students who prefer to listen to content in these areas are unable to do so without an external text-to-speech tool and additional effort on the part of learners, faculty and Accessible Learning Services staff. TextAid, created through ReadSpeaker, has been investigated as an option to solve this issue; however, its cumbersome application and multiple points of user failure have negated this option, at this time. A consistent alternate solution needs to be explored.

eLearn has a number of UDL, accessibility and learning preference functions for students. However, many of these functions are unknown to both students and faculty. At minimum, the following elements are required to support the broader and more effective use of these eLearn elements:

1. Professional development for faculty regarding the existence and use of these UDL and accessibility features.
2. Education for students regarding the accessibility and UDL features included in eLearn and education on how to use those tools.

The following elements embedded into eLearn would support increased UDL options for students:

- A choice of a variety of font types. A broader variety of font options were offered in a previous version of Mohawk College's Desire2Learn platform, but have been removed in a recent update.
- The ability to have discussion posts, dropbox folder details, and quizzes read aloud in the online learning environment.
- More seamless integration of the eLearn content with JAWS software, used by students who are blind or have low vision. Currently,

significant individualized accommodations are required to support this population of students.

The *UDL Standard* and *UDL Course Assessment* for Mohawk College will be developed within the parameters of eLearn's capabilities indicated in this audit.

Accommodations Audit

In order to determine the unique needs of students with disabilities, and implement the "leveling force" of UDL, an audit of commonly used accommodations at Mohawk College was performed as part of the *Universal design for learning for technology-enabled post-secondary courses at Mohawk College* research project (Burgstahler, 2015, p. 147). The following Accommodations Audit is based on the general, collated data provided by Mohawk College's Accessible Learning Services (ALS) department. The data offered here is meant to complement the data obtained from Survey 3 (see Survey Data section) in order to gain a more holistic view of accommodation-related UDL needs. In addition, Appendix A has been included to offer additional information regarding the variety of common accommodations provided to students with disabilities at Mohawk College, as well as a rationale for the use of each.

ALS works with students to develop appropriate classroom and testing accommodations based on disability documentation and assessment of functional limitations. Students who require disability-related accommodations receive a Confidential Academic Accommodation Plan (CAAP) to share with their faculty to obtain classroom and testing accommodations. The data offered by ALS ranges from April 1 to December 1, 2017 and provides direction regarding UDL implementation priorities to best provide increased accessibility and inclusion within technology-enabled courses.

Accommodation Data

The accommodation data for this audit was provided by ALS, and identifies the five most commonly prescribed classroom and testing accommodations for students with disabilities from April 1, 2017 to December 1, 2017. For the Spring/Summer 2017 semester (April 1 to August 31, 2017), a total of 834 students were included in the data provided; a total of 1045 students were included from the Fall 2017 semester (September 1 to December 1, 2017).

Table 3 outlines the five most common classroom and testing accommodations, in order of most common to least, by semester.

Table 3 – Common Classroom and Testing Accommodations Data by Semester

Rank	Classroom Accommodations	Testing Accommodations
Spring/Summer 2017 Semester		
1	56% (or 466) student CAAPs include the accommodation of class handouts/presentations in advance of class.	80% (or 664) of student CAAPs include additional time for tests. The specific percentage of students, by the amount of additional time, is included below: • 50% (or 418) student CAAPs include 50% extra time • 21% (or 175) student CAAPs include 100% extra time • 5% (or 39) of student CAAPs include 25% extra time • 4% (or 32) student CAAPs include 75% extra time
2	44% (or 370) of student CAAPs include the use of audio recording of lectures.	70% (or 580) of student CAAPs include extended time for eLearn quizzes and tests.
3	43% (or 355) of student CAAPs include additional time for writing in-class assignments accommodation.	65% (or 541) of student CAAPs include the use of the Alternative Testing Centre to write their tests/quizzes/exams.
4	26% (or 221) of student CAAPs include the extensions for assignments accommodation.	65% (or 543) of students CAAPs include the accommodation of clarification or re-phrasing of questions.
5	19% (or 158) of student CAAPs include the accommodation where the student may leave class for short periods of time.	32% (or 435) of student CAAPs include the accommodation of having access to computer for spelling and grammar check.
Fall 2017 Semester		

1	47% (or 486) student CAAPs include the accommodation of class handouts/presentations in advance of class.	76% (or 797) of student CAAPs include additional time for tests. The specific percentage of students, by the amount of additional time, is included below: • 53% (or 550) student CAAPs include 50% extra time • 15% (or 175) student CAAPs include 100% extra time • 5% (or 51) of student CAAPs include 25% extra time • 3% (or 41) student CAAPs include 75% extra time
2	39% (or 407) of student CAAPs include the use of audio recording of lectures.	67% (or 697) of student CAAPs include extended time for eLearn quizzes and tests.
3	39% (or 403) of student CAAPs include additional time for writing in-class assignments accommodation.	65% (or 678) of student CAAPs include the use of the Alternative Testing Centre to write their tests/quizzes/exams.
4	24% (or 256) of student CAAPs include the extensions for assignments accommodation.	61% (or 642) of students CAAPs include the accommodation of clarification or re-phrasing of questions.
5	18% (or 185) of student CAAPs include the accommodation where the student may leave class for short periods of time.	27% (or 280) of student CAAPs include the accommodation of having access to computer for spelling and grammar check.

Conclusions

The five most common classroom and testing accommodations are consistent across the semesters documented. Applying the UDL guidelines to the accommodation data provided in Table 4 can proactively eliminate barriers to create more inclusive learning environments and limit the need for individualized, disability-related accommodations. The *Universal design for learning for technology-enabled post-secondary courses at Mohawk College* research project intends to use the Accommodations Audit data found in this document in two ways:

1. To provide evidence to develop a *UDL Standard* for the Mohawk College community.

2. To provide direction for the *UDL Course Assessment* faculty tool to ensure that the most common accommodations, as well as accommodations that are required due to institutional barriers, are targeted.

The data provided by ALS indicates two central accommodations that require additional discussion, as well as targeting for UDL implementation: Note-taking and extended time for tests and quizzes. Both of these accommodations support a wide range of disability types, rely heavily on human resources, take significant time to arrange and UDL implementation will be a benefit to all students, including those with disability-related challenges that warrant these accommodations.

Note-Taking Support

The ALS accommodation data indicates that note-taking is a primary challenge for a large proportion of students with disabilities requiring note-taking support using either handouts/presentations in advance of class, or using an audio recorder for lectures as the top two classroom accommodations across both semesters. Having UDL initiatives to support note-taking for all students would minimize the need for students to work through the ALS registration process in order to gain course content. As Mohawk College has made a commitment to technology-enabled course delivery, using eLearn to provide note-taking support could be easily accomplished as indicated in the Common Classroom Accommodation section of Table 4.

Extended Time for Tests and Quizzes

With the vast majority of students with disabilities accessing additional time for tests/quizzes/exams across both semesters, this seems like a natural area of focus for UDL at Mohawk College. Currently the process to gain extended time for a test/quiz/exam is as follows:

1. The student registers, with ALS and provides disability-related documentation.
2. A CAAP is developed in consultation with the student.
3. The student gives the CAAP to the faculty for the course they would like accommodations in.
4. When there is a test, the student completes an online test booking form to book the test in the Alternative Testing Centre.
5. The form is received and the faculty is notified.
6. The faculty provides the test to the Alternative Testing Centre.

7. On the day of the test the student writes their test in the Alternative Testing Centre with additional time.

Not only are the accommodation arrangements a barrier for students and faculty, but the student is removed from class, thus inhibiting his/her ability to gain question clarification directly from the faculty. Extended time for tests seems to be the most time and resource intensive for students, faculty and testing centre staff. The *Universal design for learning for technology-enabled post-secondary courses at Mohawk College* project research supports the need for more inclusive and accessible testing supports to limit the need of individualized accommodations for additional time as noted in Table 4.

Table 4 indicates the common accommodations listed in Table 3 and examples that illustrate how UDL implementation can proactively remove barriers and create more accessible learning environments at Mohawk College. Each of the UDL examples listed makes use of Mohawk College's LMS. eLearn is capable of the UDL solutions described based on the LMS Audit completed for this research project. Please note that Table 4 is not an exhaustive list of all possible UDL solutions using eLearn, but ones that would be easily accomplished with minimal support required for students or faculty, and targeting the five most common classroom and testing accommodations.

Table 4 – Common Accommodations and UDL Solutions

Common Classroom Accommodation	**UDL Solution Using eLearn**
Class Handouts/Presentations in Advance of Class	Faculty can use eLearn to post course handouts and presentations, for all students, in advance of class. Release conditions can be used to provide additional posting options for faculty, if they would prefer to post week by week, after specific content has been completed or when assessments have been submitted. A variety of class handout/presentation and note taking options for faculty have been developed and made available.
Audio Recording of Lectures	Faculty can video record lectures, provide video summaries and/or audio record the lecture and post to the eLearn course site for all students. In addition, if the lecture presentations are posted to eLearn in advance of class, the need to audio record lectures may be negated for some students with disabilities.

Additional Time for Writing In-class Assignments	Posting written assignment instructions, on eLearn, in advance of class would allow any student who may need additional time to complete the assessment, an opportunity to prepare prior to class. Alternatively, if additional time cannot be provided in advance of class, the submission Dropbox in the course could be opened for an extended period of time so that all students could submit shortly after class, as opposed to in-class.
Extensions on Assignments	Assignment dropboxes in eLearn can be opened for extended periods of time for entire classes, or individual students, as needed. However, using the eLearn course calendar to include interim due dates would support students who have executive functioning challenges and require extensions on assignments due to disability-related time management limitations. Additional ideas for providing interim due dates has been developed and made available to faculty.
Leaving Class/Breaks	Having course materials posted to eLearn means that students who need to leave class or take breaks will not miss key information. In addition, having a clear, posted learning plan and/or using the eLearn course calendar, will ensure that students know what is going to be taught in-class and be able to prepare in advance in the event they need to leave the classroom.

Common Testing Accommodation	**UDL Solution Using eLearn**
Extended Time for Tests	Providing extended time for in-class tests would be best, but not always possible given the physical classroom space constraints at the college. Administering tests through eLearn allows faculty to open tests for a longer period of time for individual students who have this accommodation. However, an ideal situation would be to offer students additional time to best support the needs of all learners and tests delivered through the LMS make this possible. A statement could be posted wherever test information is included to ensure students are aware of the extended time and individual accommodation requests would not be required.

Extended Time for eLearn Quizzes	While individual eLearn quizzes can be opened for longer periods of time to ensure disability-related accommodations are provided, adding extended time for all students minimizes additional work for faculty and supports every learner who may benefit from additional time, but do not have accommodations. Quizzes in eLearn can be opened for any length of time the faculty chooses. A standard statement regarding additional time already being included can be posted wherever there is quiz information within the eLearn course.
Use of the Alternative Testing Centre	The use of the Alternative Testing Centre is primarily for the extended time on tests and quizzes. Using eLearn for testing would allow faculty to provide the extended time accommodation for the course quizzes/tests/exams and reduce the number of students needing to access the Alternative Testing Centre. For those students requiring the use of a reader, tests in eLearn can be read using Doc Reader or ReadSpeaker provided that they are posted in a workable format (HTML, Word, PDF, etc.), again limiting the individual accommodation need for students with disabilities to book their quizzes/tests/exams in the Alternative Testing Centre.
Clarification/Rephrasing of Questions	When students are required to leave class to obtain their testing accommodations, such as additional time, they lose the opportunity to gain clarification directly from their faculty. Tests administered through eLearn could take advantage of the chat function through eLearn to provide an opportunity for students to ask their faculty questions directly. In addition, if the quiz/test/exam was provided in a workable format (HTML, Word, PDF, etc.) students could listen to the questions and their responses to improve comprehension for some, and limit the need for additional clarification or rephrasing of questions.

Access to a Computer for Word Processor for Spell and Grammar Check	Including quizzes/tests/exams within eLearn allows all students to complete written portions of quizzes/tests/exams using word processing software, such as Microsoft Word and having access to spelling and grammar check options. Unless the learning outcome being assessed is specifically grammar and spelling, the use of spell and grammar check supports many students to more accurately display their knowledge.

While the Accommodation Audit offers some illustrative examples of how UDL and eLearn could be applied to the most common disability-related testing and classroom accommodations, UDL Guidelines are not prescriptive and not all solutions will support all assessments, course material, or course learning outcomes. However, reducing the need for individualized accommodations by focusing UDL implementation on common disability-related accommodations using eLearn would certainly support a reduction of systemic learning barriers and provide more accessible learning environments for all students.

Survey Data

The MCOM 10214 – Accessible Content Production course served as this research study's baseline for UDL implementation in technology-enabled courses at Mohawk College. As indicated in the *Universal design for learning standard for technology-enabled post-secondary courses at Mohawk College* eCampus Ontario grant proposal, the MCOM 10214 course was fully designed, developed, and is delivered using UDL guidelines. The surveys used to gather data were based on the UDL elements implemented in the MCOM 10214 course.

The Mohawk College Research Ethics Board (REB) approved this study's survey processes and methodology. The surveys employed a mixed method approach in order to gain quantitative and qualitative data from both students and faculty. Surveys were administered by Mohawk College's Institutional Research department either through eLearn or via web link. The raw survey data obtained has been digitally stored and protected on a secure, internal server and resides with Institutional Research.

There were a total of 5 surveys used in the *Universal design for learning standard for technology-enabled post-secondary courses at Mohawk College* research project:

- Survey 1a and 1b: Pre- and post-surveys for students in courses which have employed UDL elements.
- Survey 2a and 2b: Pre- and post-surveys for faculty who have employed UDL elements in their courses.
- Survey 3: A general survey about UDL for students accessing accommodations through the ALS.

The surveys were designed to offer participants an opportunity to identify UDL elements in their courses, as well as give their perspective on each element. The surveys were divided by UDL principles: Multiple means of representation, multiple means of action and expression, and multiple means of engagement. In addition, the survey tools applied UDL guidelines to minimize the need for individualized accommodations.

Table 5 is divided by semester and includes the survey type, intended participants, sample size (as indicated in the approved REB application), as well as the actual sample sizes.

Table 5 – Survey Information by Semester

Survey Type	Intended Participants	Intended Sample Size	Actual Sample Size
Spring/Summer 2017			
Surveys 1a and b (Student Pre- and Post-Surveys)	Students in a technology-enabled course that includes UDL elements.	Five to ten courses, of varying class sizes, delivered during the Spring/Summer 2017.	Survey 1a - 225 students were invited to participate and 15 participated. Survey 1b - 189 students were invited to participate and 10 participated.

Surveys 2a and b (Faculty Pre- and Post-Surveys)	Faculty members teaching a technology-enabled course employing UDL elements in the design, development and/or delivery of curriculum.	Five to ten faculty members delivering courses during the Spring/Summer 2017 semester.	Survey 2a - 7 faculty members were invited to participate and 7 participated. Survey 2b - 8 faculty members were invited to participate and 7 participated.
Survey 3 (Students Registered with ALS)	*Students registered with ALS and receiving disability-related accommodations.*	Approximately 1000 students, in total, will be invited to participate over both semesters.	123 students were invited to participate by ALS and 6 participated.
Fall 2017			
Surveys 1a and b (Student Pre- and Post-Surveys)	Students in a technology-enabled course that includes UDL elements.	Five to ten courses, of varying class sizes, delivered during the Fall 2017 semester.	Survey 1a - 1503 students were invited to participate and 71 participated. Survey 1b - 1334 students were invited to participate and 65 participated.
Surveys 2a and b (Faculty Pre- and Post-Surveys)	Faculty members teaching a technology-enabled course employing UDL elements in the design, development and/or delivery of curriculum.	Five to ten faculty members delivering courses during the Fall 2017 semester.	Survey 2a - 16 faculty members were invited to participate and 14 participated. Survey 2b - 16 faculty members were invited to participate and 9 participated.
Survey 3 (Students Registered with ALS)	*Students registered with ALS and receiving disability-related accommodations.*	Approximately 1000 students, in total, will be surveyed between both semesters.	631 students were invited to participate by ALS and 61 participated.

Faculty teaching within a variety of academic schools were invited to participate in the *Universal design for learning standard for technology-enabled post-secondary courses at Mohawk College* project surveys. These schools included Community Studies, Business, Media Studies, Social Services and Justice Studies, Liberal Studies, and Engineering Technology.

Surveys were to be administered on the following schedule:

- Surveys 1a and 2a, administered by Mohawk College's Institutional Research department through eLearn, near the third week of the Spring/Summer 2017 and Fall 2017 semesters.
- Surveys 1b and 2b, administered by Mohawk College's Institutional Research department through eLearn, near the thirteenth week of the Spring/Summer 2017 and Fall 2017 semesters.
- Survey 3, administered by ALS using an emailed survey link provided by Mohawk College's Institutional Research department, near the seventh week of the Spring/Summer 2017 and Fall 2017 semesters.

Results

Overall, the surveys employed in the *Universal design for learning standard for technology-enabled post-secondary courses at Mohawk College* project yielded strikingly similar data results between the Spring/Summer 2017 and Fall 2017 semesters. In addition, there were minimal differences between the pre- and post-surveys for both faculty and student participants. The survey results here are an accumulation of both semesters, divided by participant group, and identify UDL implementation trends and priorities.

Student Surveys – Surveys 1a and b

The following list includes the UDL elements that the majority of students (over 60%) stated were in their course(s) and that they found "very useful" or "somewhat useful" to their learning:

- Access to the same course information in multiple ways.
- The learning plan matches the modules and the grade book.
- Learning opportunities and assignments that use a student's prior knowledge.
- Terms, symbols and/or acronyms are explained.
- Embedded links throughout the course content to create easy access to information.
- Encouragement of independent student responsibilities.
- Accessible course materials and resources.
- Presentations that are explicit and uncluttered.
- Note-taking support is provided.

- Course content provided in multiple ways to allow students to review the material multiple times.
- Opportunities to demonstrate knowledge in multiple ways.
- Multiple ways for students to communicate with faculty and classmates.
- Encouragement for students to communicate with faculty and classmates.
- Assessments that build on each other and allow for multiple opportunities to show knowledge.
- Access to the course content from multiple areas of the course.
- Interactivity and engagement in the classroom and online.
- Ability to complete, at least some, course content at the student's own pace.
- Explicit instructions that set clear goals and expectations.
- Clear due dates.
- Prompts when due dates are coming up.
- A learning plan, with explicit due dates, is followed.
- Course modules broken down by tasks, or into smaller sections.
- Opportunities to choose to work individually or in groups.
- Assignments that allow for personalization.
- Instructions for assignments, quizzes, and tests that are presented in a way that is inclusive and supportive.

The majority of students (100% in the Spring/Summer semester and 72% in the Fall semester) indicated that UDL is "very" or "somewhat" beneficial to their learning. In addition, just under 61% of students felt that UDL should be implemented in all Mohawk College courses.

Faculty Surveys – Surveys 2a and b

Faculty were asked to indicate what UDL elements were included in the course being surveyed. The following list are the questions that the majority of faculty (over 60%) responded "yes", clarifying current UDL implementation in the courses surveyed:

- Can students access the same course information in multiple ways?
- Does the learning plan match the modules and the grade book?
- Are new terms, symbols and/or acronyms explained?
- Are there embedded links throughout the course content to create easy access to information?
- Does this course encourage independent student responsibilities?

- Is the course content provided in multiple ways that allow students to review the material multiple times?
- Do students have multiple ways to communicate with you and classmates?
- Are students encouraged to communicate with you and their classmates?
- Do assessments build on each other and allow for multiple opportunities for students to show their knowledge?
- Can students complete, at least some, course content at their own pace?
- Are students provided with explicit instructions that set clear goals and expectations?
- Are due dates made clear?
- Are students prompted when due dates are coming up?
- Is the learning plan, with explicit due dates, followed?
- Are the course modules broken down by tasks, or into smaller sections?
- Are instructions for assignments, quizzes, and tests presented in a way that is inclusive and supportive?

The majority of faculty (60% or more), from both semesters surveyed, perceived a benefit for both faculty and students for the following UDL elements:

- Access to the same course information in multiple ways.
- The learning plan matches the modules and the grade book.
- Terms, symbols and/or acronyms are explained.
- Embedded links throughout the course content to create easy access to information.
- Encouragement of independent student responsibilities.
- Accessible course materials and resources.
- Course content provided in multiple ways to allow students to review the material multiple times.
- Multiple ways for students to communicate with faculty and classmates.
- Encouragement for students to communicate with faculty and classmates.
- Assessments that build on each other and allow for multiple opportunities to show knowledge.
- Ability to complete, at least some, course content at the student's own pace.

- Explicit instructions that set clear goals and expectations.
- Clear due dates.
- Prompts when due dates are coming up.
- A learning plan, with explicit due dates, is followed.
- Course modules broken down by tasks, or into smaller sections.
- Instructions for assignments, quizzes, and tests that are presented in a way that is inclusive and supportive.

All faculty respondents from both semesters indicated that they feel UDL is, to varying degrees, beneficial for themselves and their students. Faculty participants also emphatically stated that UDL should be implemented in all Mohawk College courses, with 100% indicating "yes" in the Spring/Summer semester and just under 89% in the Fall semester.

Survey for Students Registered with ALS – Survey 3

To maintain student confidentiality, ALS administered Survey 3 to students registered and receiving accommodations from ALS by confidentially emailing an invitation to participate and a link to the survey that was provided by Mohawk College's Institutional Research department.

Along with a variety of accommodation-related questions, students with disabilities were asked to indicate what UDL elements they would find beneficial to be included in their courses. The following is a list of UDL elements, as written in the survey, that received at least 50% support from the students surveyed:

- Access to the same course information in multiple ways.
- The learning plan matches the modules and the grade book.
- Encouragement of independent student responsibilities.
- Presentations are explicit and uncluttered.
- Course content provided in multiple ways to allow you to review the material multiple times.
- Online quizzes/tests that are untimed.
- In-class quizzes/tests that are untimed.
- Able to complete course content at your own pace.
- Explicit instructions that set clear goal and expectations.
- Clear due dates.
- Prompts when due dates are coming up.
- A learning plan, with explicit due dates, is followed.
- Course modules broken down by tasks, or into smaller sections.
- Opportunities to choose to work individually or in groups.

- Instructions for assignments, quizzes, and tests presented in a way that is inclusive and supportive.

Based on the survey data and the student comments provided, students registered with ALS felt that proactively adding additional time, or including unlimited time, to complete for tests and/or quizzes was a key priority, both online and in-class. This group of participants also indicated that providing note-taking support options within the course is a prominent need.

When asked how useful UDL would be, 76% of students with disabilities from both semesters surveyed indicated that UDL would be helpful to their learning. When asked if UDL should be included in all Mohawk College courses, 76% of students with disabilities surveyed in both semesters indicated "yes".

Overall, the comments from Survey 3 were positive regarding UDL and its implementation at Mohawk College. Comments unrelated to UDL were also provided by this group of participants; however, the majority of these were regarding accommodation-related service provision, or indicated confusion about the difference between UDL and accommodations. It is suspected that the confusion illustrated by these comments could be mitigated by a UDL statement, including links to UDL resources, on each student Confidential Academic Accommodation Plan (CAAP).

Conclusions

Based on their course experiences, students and faculty agreed on a number of UDL elements. The following list of UDL elements are either already widely used and considered beneficial in courses, or would be, if offered:

- Accessing the same course information in multiple ways.
- Matching the learning plan to the modules and the grade book.
- Encouraging independent student responsibilities.
- Providing course content in multiple ways.
- Completing, at least some, course content at the student's own pace.
- Providing explicit instructions that set clear goals and expectations.
- Making due dates clear.
- Prompting when due dates are coming up.
- Following the learning plan, which includes explicit due dates.
- Breaking course modules down by tasks, or into smaller sections.
- Presenting instructions for assignments, quizzes, and tests in a way that is inclusive and supportive.

The data gathered from the surveys employed in the *Universal design for learning standard for technology-enabled post-secondary courses at Mohawk College* project was consistent between semesters, participants and pre- and post- data. The data obtained was used, in combination with the research study literature review, LMS audit and accommodation audit to develop the *UDL Standard* and *UDL Course Assessment* tool for faculty.

UDL Implementation at Mohawk College

Based on the literature review, LMS audit, accommodation audit and data gathered from the surveys, a UDL Standard for Mohawk College has been developed, as well as a *UDL Course Assessment* tool for faculty. The following sections outline each deliverable, a *UDL Standard* and *UDL Course Assessment* for the *Universal design for learning for technology-enabled post-secondary courses at Mohawk College* research project.

There were UDL elements included in the surveys and indicated as important, but were not included in the final *UDL Course Assessment* tool for faculty, or the *UDL Standard*. One such element included the ability to alter the online learning environment to meet students' learning preferences. An eLearn widget has been created to support faculty and students to do this; however, the survey highlighted that neither students nor faculty are aware of this option. To make the eLearn Accessibility and Preference widget more prominent in courses, it has been added to the My Home Page on eLearn for students and verbiage has been included in the Course Master Shell Template to advise students and faculty of these options. The use of progress checklists did not appear to be of use to either faculty or students, which is understandable as eLearn course progress can be checked automatically as students access course content.

While assignment submission options did not seem to be of central concern to faculty or students, the need to have them within courses is an essential element of UDL implementation. Greater clarity regarding the need for assessment submission options to provide opportunities for all learners to demonstrate their knowledge needs to be provided and its importance stressed. The same is true for interactive learning activities. The focus in the surveys was on online interactive activities; however, given the blended nature of Mohawk College courses, the focus needs to be on both online and face-to-face interactive learning activities. The *UDL Course Assessment* tool for faculty and the *UDL Standard* reflect this need.

UDL Standard for Mohawk College

While the *UDL Standard* for Mohawk College offered here is not solely for technology-enabled courses, it is important to reiterate that Mohawk College is a blended learning institution. Meaning the strong majority of courses are technology-enabled and use the College's LMS, eLearn. To view the UDL Standard for Mohawk College in its entirety, see Appendix B.

It is hoped that the *UDL Standard*, developed as a result of the *Universal design for learning for technology-enabled post-secondary courses at Mohawk College* research project, be adopted by Mohawk College's Senior Leadership Team. While Academic Operations, Program Quality and the Centre for Teaching & Learning, as well as Accessible Learning Services support the proposed *UDL Standard*, additional consultation is desired. Prior to the implementation of this standard input and feedback will be sought from the following:

- Mohawk College's UDL sub-committee
- Local 240 faculty union
- Office of the VP Academic

Once the UDL Standard is implemented, it is intended that it be used as part of a larger course/program quality standard for Mohawk College courses.

UDL Course Assessment

As part of *Universal design for learning for technology-enabled post-secondary courses at Mohawk College* study a *UDL Course Assessment* tool was developed for faculty to measure UDL implementation within their technology-enabled courses and contains two parts: 1. The assessment itself which contains 30 questions divided by the UDL guidelines, and 2. A UDL Guide which contains all of the "no" response comments with live links to additional resources (Appendix C). The measurement tool has been designed to be flexible to support a wide range of course materials and teaching styles. The *UDL Course Assessment* can be viewed in its entirety by accessing the link provided.

The *UDL Course Assessment* tool for faculty will be housed on the Mohawk College UDL Implementation webpage to provide easy access for faculty. In addition, the assessment can be easily linked in a variety of documents and presentations. Furthermore, it is intended that the *UDL Course Assessment* be used as an interactive learning activity for technology-enabled UDL professional development, yet to be designed.

There are limitations to the *UDL Course Assessment* as it does not measure the impact of the UDL elements included in each course. As the assessment is designed to be used by faculty to evaluate their own UDL implementation, no implementation or course data is collected.

Based on data gathered early in UDL implementation at Mohawk College it is important to note that the *UDL Course Assessment* tool for faculty can be updated as technology evolves, UDL implementation increases and as more data regarding UDL is obtained.

Project Limitations

Learning Management System Audit Limitations

The primary challenge with the LMS Audit is the rapid pace at which technology evolves. Fortunately, an update to eLearn occurred just prior to the audit, so the information gathered will be accurate for the foreseeable future. However, this is not to say that additional software packages could not be developed and purchased to provide additional accessibility functionality or create enhanced options for assessments. For example, Mohawk College is currently reviewing test monitoring software which would allow for better monitoring of quizzes/tests/exams taken through eLearn.

Accommodation Audit Limitations

The accommodation-related data for the Fall 2017 semester does not take into consideration the entirety of the semester because the Ontario college work stoppage extended the semester into January, which would delay the production of the project deliverables. Fortunately, the bulk of students with disabilities requiring accommodation-related support registered well before the final weeks of the Fall 2017 semester.

The data represented here identified the accommodations included on students CAAPs. However, ALS does not have data which indicates how regularly these accommodations are used by individual students. While basing UDL implementation initiatives on student accommodation use, using the commonly prescribed accommodations will still help to direct UDL implementation to target the needs of students with disabilities.

Survey Data Limitations

The question regarding learning plans matching modules and grade book, should have been more reflective of the LMS capabilities and read “Dropbox” as opposed to “grade book”. For consistency all surveys administered used

the same language; however, the change to "Dropbox" was made in the *UDL Course Assessment* for accuracy.

Surveys issued by ALS were not done in line with the proposed survey schedule. The first survey was delivered approximately two weeks after the intended date due to departmental survey administration challenges. The second survey was administered on time, but was the first day of the provincial college faculty strike and received no respondents. The survey was re-administered based on the revised semester schedule in order to gain student participation.

Based on the number of students registered with ALS in the semesters surveyed, the number of potential participants should have been higher with 834 students receiving disability-related accommodations in the Spring/Summer 2017 semester, and 1045 students in the Fall 2017 semester. However, ALS determined the list of potential participants and sent the survey to considerably fewer students in each semester of the research study as indicated in Table 5.

It is suspected that the provincial college faculty strike in October 2017 caused challenges gaining willing participants for the Fall 2017 student and faculty surveys. While the Fall 2017 surveys 1 (a and b) and 2 (a and b) still met the intended sample sizes, larger sample sizes would have been preferred. In addition, the timeline for the dissemination of surveys 1b and 2b in the Fall semester were delayed due to the work stoppage and were delivered in week thirteen of the revised semester schedule.

By far the primary study limitation was sample size. UDL, as a strategic priority, is relatively new to Mohawk College and there were few courses that met the study criteria which made finding faculty who have employed UDL in their course design, development and/or delivery at this early stage problematic. The data yielded from the Spring/Summer 2017 semester was particularly small. While there were benefits to starting the research study during the summer semester (primarily gaining additional data, ensuring the measurement tools were suitable and finalized, and working through Institutional Research processes), it was with the understanding that there would be few participants as Mohawk College's Spring/Summer semester intake is considerably smaller than the Fall semester. Although the study was able to meet the anticipated participant rates, it would have been ideal to have more participants. While the sample size does not provide definitive data to be extrapolated to all of Mohawk College's technology-enabled courses, the survey data did provide feedback and direction regarding

faculty and student priorities for further UDL implementation and helped to inform the *UDL Course Assessment* and *UDL Standard* for Mohawk College.

Future Research

As Mohawk College is committed to UDL implementation, the *Universal Design for Learning for Technology-enabled Post-Secondary Courses at Mohawk College* research study represents the first step in ongoing UDL research and implementation at Mohawk. The *UDL Standard* and the *UDL Course Assessment* that have been developed as a result of the research, have been created to be dynamic tools for UDL implementation, meaning they are modifiable and adaptable as new data is obtained.

Due to the limitations noted above, larger sample sizes are required for future research studies. It is hoped that, in the future when UDL implementation is more widespread at Mohawk College, a research study could be undertaken again, to gain additional data.

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The following section offers additional information regarding common accommodations at Mohawk College and a rationale for the use of each. Please note that this is not an exhaustive list of all disability-related accommodations at Mohawk College.

Classroom Accommodations

Reduced Course Load

A reduced course load can be an effective accommodation as the reduction in courses results in fewer assessments to take, fewer assignments and tests to manage, and more time during the week to access necessary supports such as tutoring, counselling, and mentoring support.

Audio Recording of Lectures

Audio recording of lectures can be an effective way to review lecture material for persons whose disability impacts working memory, attention, focus, or mobility challenges that impact writing notes.

Class Handouts/Presentations in Advance of Class (if not already provided on eLearn)

Since many disabilities impact the speed and efficiency with which lecture material is processed, the ability to pre-read material from a lecture can be helpful. Class handouts/presentations given in advance of class allows the student to develop a level of understanding of the material prior to learning the material in class.

Designated Seating

Sitting close to instruction may facilitate an increase in student attention and focus, for individuals with disabilities that impact attentional regulation.

Peer Support Assistant (in-class peer support)

Students who experience disability-related mobility, social, or communication challenges may benefit from a peer support assistant. Peer support assistants offer in-class and outside of class support in the following areas:

- Understanding classroom and course expectations
- Providing reminders to stay on task
- Assisting with group work participation, social integration and communicating with peers
- Monitoring and responding to increases in frustration and/or stress
- Providing assignment clarification
- Reminding to book tests and exams with accommodations
- Supporting access to peer tutoring

- Assisting with the physical aspects of course (e.g., obtaining books from book bag, accessing computer/technology, moving to and from class).

Interpreter/Computerized Note-taker

For students who are Deaf/deafened, or hard of hearing, an interpreter or a computerized note-taker may be required to support communication. The interpreter provides sign language interpretation of class content, while the computerized note-taker uses a laptop to record class communication.

Physical Restrictions

A student's disability may limit range of motion and impact such physical tasks as standing for long periods of time, sitting for long periods of time, bending, or lifting.

Alternate Format Materials

Students with sensory or print disabilities may require digitized lecture content and textbooks to support the use of assistive technology to access course content.

Presentation Accommodations

For some students, presenting in front of groups can exacerbate disability-related symptoms. Alternatives to presenting may be required. A guide to Presentation Accommodations has been developed to support students and faculty, and can be found on Mohawk College's website under Accommodation Guides in ALS Resources.

Missed Classes

Students with episodic disabilities may be required to miss the occasional class when there is an exacerbation of symptoms, or medical appointments as they work to manage their disability.

Captioning of Videos

For students who are Deaf/deafened/hard of hearing, course videos should be captioned so that video content is accessible.

Leaving Class/Breaks

The impact of a student's disability may necessitate that the student leave class for brief periods as he/she attempts to manage disability-related issues.

Group Work

Students who experience communication and social challenges related to a disability diagnosis may struggle with group work. These students may need

additional guidance from the professor with getting into groups, and understanding their roles and tasks within a group.

Additional Time for Writing

Students with written expression challenges may need to negotiate more time for writing assignments that have a time constraint such as a need to complete the assignment before the end of a class period.

Computer Usage for Assignments

Students with written expression challenges may find it difficult to see errors with writing assignments. As such, a student may need to use word processing software in order to use the spell and grammar check features. When access to a computer is not available for an in-class assignment, marks should not be deducted for spelling and grammar.

Extensions on Assignments

Students with a diagnosis of an episodic disability may need, on occasion, to request an extension on an assignment if:

- An exacerbation of symptoms related to the student's disability diagnosis has prevented the student from attending classes resulting in missed assignments.
- An exacerbation of symptoms related to the student's disability has resulted in the student's inability to meet a deadline date for an assignment.

A guide to this accommodation, to support students and faculty, can be found on Mohawk College's website under Accommodation Guides in ALS Resources.

Testing Accommodations

Extended Time for Tests

There are a variety of disability diagnoses that impact information processing in testing situations. Therefore, extended test time is offered to provide additional time for students to process and respond to test questions.

Extended Time for eLearn Quizzes

As noted above, there are a variety of disability diagnoses that impact information processing in testing situations. Extended time for eLearn quizzes or tests allows students with information processing-related disabilities additional time to process and respond to eLearn quiz/test questions.

Access to a Computer for Word Processor

Use of a computer for spelling and grammar check is needed to compensate for disability-related written language challenges. When this accommodation is required, students write their tests in the Alternative Testing Centre where the computers are monitored by staff to ensure students are not using resources that are not approved for their test/exam.

Clarification/Rephrasing of Questions

Disability-related comprehension challenges can impact test-taking for some students. To compensate for reading challenges, students can request clarification of questions by an invigilator or from a professor if the invigilator cannot provide clarification.

Cubical/Isolation

For some students, the testing situations can lead to an exacerbation of symptoms related to their disability. To mitigate the impact of disability, an environment is needed that minimizes noise from others, as well as provides the student with opportunities to "think out loud" as verbalizing responses to questions is the type of accommodation required.

Use of Assistive Technology

Students with disabilities that impact reading and writing may need to use assistive technology to minimize the impact of these deficits when testing.

Reader/Scribe

For students who are not currently assistive technology users, Alternative Testing Centre staff will read test questions and/or scribe the student's question responses.

Spacing of Exams

For some students, taking more than one exam per day, or having little time between exams scheduled on the same day can exacerbate disability-related symptoms or not give appropriate processing time between exams.

Memory Aid/Formula Sheet

A memory aid is a testing accommodation intended for students who experience significant memory challenges during testing. A memory aid is an original, student-created support that is designed to trigger recall during an assessment. A guide to this accommodation has been developed to support students and faculty, and can be found on Mohawk College's website under Accommodation Guides in ALS Resources.

Calculator Use

Students with disability-related limitations in math calculation/numerical operations may require a calculator when completing math problems.

Breaks During Tests

There are a variety of disability diagnoses that make testing for long periods of time problematic. For students who experience challenges with attention, concentration, and pain the ability to take brief breaks to stand, stretch, and move can be helpful.

Dictionary/Thesaurus Use

For students with disability-related spelling and reading comprehension challenges, a dictionary or thesaurus may be required to define words and phrases and provide context when testing.

Music/Ear Plugs

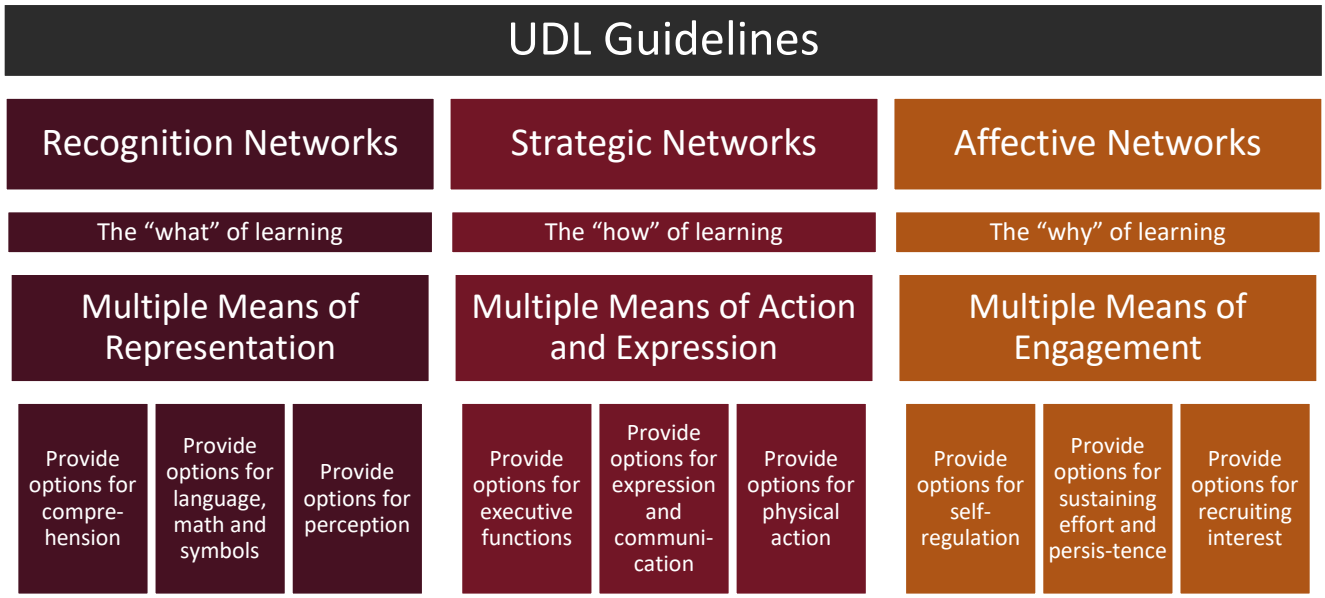
For students who experience attention, focus, and concentration challenges related to their disability, listening to music, and thereby tuning out certain other environmental noises, can help with sustained attention and focus.

In addition, Accessible Learning Services also support, and can facilitate, the sharing of diagnosis-related information in specific cases where students would benefit from disclosure. For example, students with a diagnosis of Autism Spectrum Disorder (ASD) may experience social and communication challenges that may have an impact in a classroom environment. In an effort to support the faculty to respond to social or communication challenges, an Autism Faculty Guide (including a definition of ASD, strengths associated with ASD, challenges associated, and teaching strategies) was developed. With the student's consent, this guide is shared with faculty.

UDL Standard for Mohawk College

Introduction

Universal Design for Learning (UDL) is a curriculum design, development and delivery framework used to create accessible and inclusive learning environments. UDL guidelines are based on three primary brain networks: Recognition, Strategic and Affective. Each network is then identified by a principle to provide multiple means of representation, action and expression, and engagement. To guide design, development and delivery, options for consideration are given for each principle as indicated below.



Mohawk College's Program Quality Policy outlines the College's commitment to program delivery integrating innovation, best practices, and alternative approaches to teaching and learning to enhance accessibility, student success and satisfaction. UDL is a best practice approach to curriculum design, development and delivery, and its implementation meets each of these quality elements.

UDL is not prescriptive, but rather encourages the consideration of options that remove learning barriers and promote inclusion. The development of a *UDL Standard* for Mohawk College supports:

- Advancing Mohawk College's commitment to accessibility and inclusion.

- Meeting, or exceeding, the Accessibility for Ontarians with Disabilities Act (AODA) educational standards.
- Facilitating a culture shift in design, development, and delivery of education by implementing UDL in services, teaching and learning.

UDL Standard

The *UDL Standard* for Mohawk College includes UDL elements that are:

- Based on faculty and student input gathered during the *Universal design for learning for technology-enabled post-secondary courses at Mohawk College* research study.
- Tied to the UDL guidelines and principles developed by the Centre for Applied Special Technology (CAST).
- Supported by Mohawk College's learning management system (LMS), eLearn.
- Supported by Mohawk College's Academic Operations, Program Quality and Centre for Teaching & Learning, as well as Accessible Learning Services.

The application of UDL within a program or course is dependent on a variety of factors including core competencies, learning outcomes, course content, delivery method(s), class demographic and capabilities of the LMS. Broadly, the *UDL Standard* recommends that:

- UDL guidelines are considered when designing or revising new programs and/or courses at Mohawk College.
- UDL elements are integrated into Mohawk College programs and courses.
- All employees consider UDL implementation as a means to meet the AODA standards for the educational accessibility requirements, as well as reduce the need for individualized, disability-related accommodations.
- Mohawk College provide support for UDL implementation.

Specifically, the *UDL Standard* asks those designing, developing and delivering curriculum to consider the following UDL elements and options identified below.

UDL Considerations for Course Design:

- Designing course resources that are concise and explicit, and ensuring course expectations include:
    - Learning outcomes and learning goals

    - Learning plan with clear due dates
    - Course navigation instructions
    - Assignment outlines/instructions
- Creating online learning environments that have clear layouts and include access to course content from multiple areas in the course.
- Including varied assessment methods, that include a variety of options for learners to demonstrate their knowledge.

UDL Considerations for Course Development:

- Producing course content that:
    - Is provided in multiple ways
    - Is concise, explicit and accessible
    - Explains terms, symbols and/or acronyms
    - Engages students' prior knowledge
    - Embeds links to learning materials throughout the course content to create easy access to information
    - Allows the completion of, at least some, course content at students' pace and/or in their preferred order
- Constructing assessments that:
    - Accurately evaluate the course learning outcomes and goals
    - Build on the new skills students acquire
    - Provide multiple opportunities for students to demonstrate their knowledge
    - Have clear instructions offered in an inclusive and supportive way
- Encouraging independent student responsibilities.

UDL Considerations for Course Delivery:

- Providing note-taking support.
- Including interactive learning activities in-class and/or online.
- Offering options for students to work individually, in pairs, or in groups.
- Encouraging communication between students and with faculty through a variety of means.
- Evaluating knowledge by:
    - Offering choices regarding how students submit, at least some, assignments
    - Proactively adding additional time to quizzes and tests, or not timing quizzes or tests

- Prompting students regarding due dates and/or giving interim due dates for large assignments.

As UDL implementation is a dynamic process, so is this *UDL Standard*. It is recommended that Mohawk College's UDL standard be updated as technology evolves, as UDL implementation increases and as more UDL-related data is gathered.

Resources

The *UDL Standard for Mohawk College* was developed using:

- Research from the *Universal design for learning for technology-enabled post-secondary courses at Mohawk College* eCampusOntario research study.
- The Mohawk College Program Quality Policy.
- The Universal Design for Learning Information for Faculty document.
- *Universal design for learning: Theory and practice* by A. Meyer, D. H. Rose and D. Gordon

To support the implementation of UDL in teaching and learning approaches, Mohawk College is committed to providing professional development, consultation opportunities, and resources to faculty. The UDL webpages, provide a starting point to access UDL resources and contact information to gain ongoing support.

In order to determine if the *UDL Standard* has been met in a course, or to obtain support in meeting the elements included in the standard, the *UDL Course Assessment* is available. The *UDL Course Assessment* is a tool designed to be used by faculty to determine the UDL elements currently being used within a course, and offer resources for additional UDL implementation.

UDL Guide

Thank you for completing the *UDL Course Assessment*. This Universal Design for Learning (UDL) Guide includes all the information that was offered when a "no" response was selected during the assessment. You can use this guide, in conjunction with your Response Report, to learn more about UDL implementation options and the resources available to support you.

Recognition Networks - Multiple Means of Representation

These 8 responses offer resources to support how content is represented in the course and what options could be provided to students for comprehension; language, math and symbols; and perception.

1. Have students been informed, explicitly, of the UDL elements included in the course?

   If you answered "no", letting students know how the course is accessible and inclusive can showcase how students will be supported in the learning environment and limit the need, and time required, to arrange individual accommodations. Feel free to copy, paste and modify the standard UDL statement found on the UDL Implementation webpage. A customized UDL statement can then be included on the course learning plan, on eLearn in the course information area and/or identified in an informational video for students.

2. Is the course content provided in multiple ways?

   If you answered "no", offering multiple ways for students to gain access to course content allows learners to choose the resources that best supports their learning and repeatedly review content, if they need to. Providing content in multiple ways can include articles, textbook readings, videos, podcasts, online activities, textbook exercises, etc. If faculty need any assistance finding additional resources contact one of Mohawk College's librarians.

3. Do the learning opportunities and assignments in this course use students' prior knowledge?

   If you answered "no", activating prior knowledge can improve retention. Providing opportunities to use prior knowledge could include offering a

reflective discussion post for each module, key concept or new skill; allowing students to choose assignment topics (possibly from a predetermined list of topics); and/or encouraging discussions (in-class or online) that promote students incorporating previous experience with new course material.

4. Are new terms, symbols and/or acronyms explained?

   If you answered "no", offering a legend of commonly used terms, acronyms, and/or symbols provides a nice, time saving reference for students. Placing the legend prominently at the beginning of the course, and drawing attention to it, will support early use.

5. Are there embedded links throughout the course content to create easy access to information?

   If you answered "no", embedding links to resources, course materials already housed in eLearn, or assessment information allows learners quick and easy access to course content, as well as access to that content from multiple locations in the course. Consider linking resources whenever possible. When hyperlinking references, use the title of the reference as the link (for an example look at the resource links in this tool). If faculty require assistance to link resources from one part of a course to another they can contact their designated Educational Technology Specialist.

6. Are the course materials and resources accessible?

   If you answered "no", proactively creating accessible resources supports a wide range of learners, including those with disabilities and saves faculty and students time during the semester. Detailed resources to support the development of accessible content can be found on the Accessibility Tools and Resources webpage. In addition, including content in more than one format can support improved accessibility for all learners. For more information review the Content Options webpage.

7. Does the course have interactive learning activities, either online or in the classroom?

   If you answered "no", providing interactive activities within a course creates an opportunity for students to practice skills and solidify concepts, while increasing engagement with the course content. The Designing Activities/Anatomy of an Activity webpage offers information to support the development of learning activities for the classroom and online.

Online activities such as Kahoot, PollEverywhere, Padlets, knowledge check quizzes, discussions, etc. can be embedded into eLearn to reinforce information and more actively engage students with course content. Including options for interactivity can be more challenging in large classes. For interactive and engaging activity ideas for large classes, check out Teaching Large Classes webpage.

8. Are learning materials and presentations explicit and uncluttered?

   If you answered "no", course materials and presentations that are explicit and uncluttered reduce distractions for learners and allow for more focus on the key content. Ideally, all course presentations will have an agenda to ensure students know what to expect, tie the content to the course learning outcomes, have clear and accessible content, and provide next steps including additional resources (if any). For more information on developing clear and concise, accessible course materials and presentations review the Creating Accessible Documents and Alternate Formats webpage.

Strategic Networks – Multiple Means of Action and Expression

These 10 responses offer resources to support how learning is facilitated in the course and what options could be provided to students for executive functions; expression and communication; and physical action.

9. Have course navigation instructions been provided for students?

   If you answered "no", navigation instructions provide learners with explicit information regarding how to proceed through the course. Navigation instructions also support students to access important information quickly and easily. For more information regarding how to develop course navigation instructions, check out the Course Navigation Instructions webpage.

10. Has note taking support been provided for students?

    If you answered "no", providing note taking support prior to delivery of content encourages students to prepare for each lesson, allows students to reflect on lecture content, and provides accurate study aides. In addition, note taking is one of the most common disability-related accommodations. Consider posting class lectures to eLearn in advance of

class, offering lecture notes, providing questions for students to answer during lectures, and/or employing crowdsourcing of lecture notes. A variety of UDL options for note taking support can be found on the Note Taking Support webpage.

11. Are tools provided to guide goal setting and expectations?

If you answered "no", helping students to set course goals and expectations supports more efficient and better quality work. Providing an overview for each week, module or assignment gives students direction regarding the time required for course work and allows them to plan accordingly. When large assignments are administered, including interim due dates offers completion goals for the learner, as well as a better sense of the assignment workload. To learn more about how to provide interim due dates, check out the Interim Due Dates webpage. Alternatively, using the eLearn calendar function can support students to regulate their workload and meet course expectations.

12. Does the course include a variety of assessment methods?

If you answered "no", including a variety of assessment methods within a course allows learners to more accurately demonstrate their knowledge. Assessment methods may include written assignments, projects, presentations, discussions, lab work, etc. Consider including three or more assessment methods within the course. For support to create authentic assessment options, check out How to Develop Assessment Tasks webpage.

13. Can students demonstrate their knowledge in multiple ways within the assessment methods used?

If you answered "no", providing options regarding assessments allows students to demonstrate their knowledge in the best way they can, while supporting faculty to more accurately assess what a student knows. Faculty can provide students with options by allowing students to choose assignment topics (this can be from a defined list if needed), allowing students to work in groups or individually, as well as offering options for how assignments are submitted. For example, faculty might request that discussion posts are completed by writing 250 words, uploading a 2 minute audio file, or providing a link to a 2 minute video.

14. Do students have multiple ways to communicate with faculty and classmates?

If you answered "no", a variety of communication options ensures that all learners can effectively communicate with their faculty, and each other. Consider providing students with a phone number, email address and designated office hours to support communication with faculty. Consider setting up a general Discussion area for students to communicate online, using the Chat function in eLearn, and/or providing time in class to discuss course content face-to-face.

15. Are students encouraged to communicate with faculty and classmates within the course?

    If you answered "no", encouraging communication in a variety of forms helps to create a strong learning community. Consider using a general Discussion area, implementing the Chat function in eLearn, providing time in class for discussion, as well as explicitly stating when and how students can connect with faculty and each other.

16. Do assessments build on each other and allow for multiple opportunities for students to show their knowledge?

    If you answered "no", consider developing assessments that include smaller assignments that allow learners to practice and master individual skills, building to a final assignment that incorporates the skills learned throughout the course. This scaffolding approach allows both faculty and students to identify learning challenges early, so that targeted learning supports can be offered prior to higher stakes assessments.

17. Are eLearn and/or in-class quizzes or tests untimed, or have had additional time proactively added?

    If you answered "no", additional time for testing is the most commonly used disability-related accommodation. In addition, a wide variety of students with strong learning preferences or English as a second language benefit from additional time to process questions and respond in order to fully demonstrate their knowledge. Proactively adding additional time, or unlimited time to quizzes and tests, delivered through eLearn or in-class, provides a more equitable assessment for all students, as well as reduces the need and time required for individualized accommodations. More information about including additional time for online quizzes and a standard statement to inform learners that additional time has proactively been added, can be found on the Additional Time for eLearn Quizzes webpage.

18. Are students able to access course content from multiple areas of the course?

    If you answered "no", providing multiple avenues for students to obtain content offers greater access to course materials and makes it less likely that students will miss important information. Consider including assessment information in Content in the week it is assigned and due, in a separate Assignment area, in the Dropbox, as well as linked on the learning plan. Readings can be included in the week they are meant to be read, as well as linked on the course learning plan. General course information can be provided on the course outline, learning plan, online course introduction and in class.

Affective Networks – Multiple Means of Engagement

These 12 responses offer resources to support how students are engaged in the learning process and what options could be provided to students for self-regulation; sustaining effort and persistence; and recruiting interest.

19. Does the course encourage independent student responsibilities?

    If you answered "no", encouraging students to be independent with their learning responsibilities, and providing tools to do so, creates more informed and capable learners over time. Providing interim due dates, allowing a choice of assignment topics, and/or giving opportunities for reflection can help students regulate their learning.

20. Can students complete, at least some, course content at their own pace or in any order they wish?

    If you answered "no", when possible, having students complete some course requirements at their own pace provides flexibility, while allowing students to manage their own time. Weekly quizzes could be opened for an entire week, allowing students to complete the quiz at a time that is ideal for them. Discussion posts or personal reflection assessments could be completed by mid-semester and semester end, instead of week by week. Providing options to students regarding the order they access content allows them to start with information they feel more comfortable with, moving to information they find more challenging; essentially scaffolding their own learning based on their personal experience and

prior knowledge. If possible, consider allowing students flexibility regarding the order in which they access and complete course work.

21. Is the course learning plan explicit and followed?

If you answered "no", when learning plans are explicit, and include due dates, students can better prepare for their semester and ensure work is completed on time. Having assessment information on the learning plan match the eLearn Dropbox makes navigation easier for students. Work to ensure that the assignment information on the learning plan is reflected by using the same titles and verbiage in the Dropbox. For more information on how to develop a concise learning plan, check out the Learning Plan webpage. If due dates need to change, inform students promptly using a variety of ways including updates to the learning plan, the eLearn course Newsfeed, emailing students and/or updating the course eLearn Calendar. By using the learning plan template in eLearn and checking the box at the bottom of the page, students will be automatically informed of changes to the learning plan.

22. Do students have choice over how they submit, at least some, assignments?

If you answered "no", when students are able to demonstrate their knowledge using a format of their choice, engagement is improved. Providing submission options for students allows them to display their knowledge of the assessment topic the best way they can, creating a more accurate opportunity to assess a learner's knowledge. Consider providing submission options for at least some assessments. Options may include allowing learners to submit discussion posts as written text, a video or an audio file or presentations completed in class or by video.

23. Are course learning goals/outcomes clear?

If you answered "no", clear and concise learning goals, based on the course learning outcomes, support students to understand the purpose and importance of course content. Consider informing students of the specific learning goals and outcomes for the course, as well as how and when the goals will be assessed. For support to develop clear learning outcomes, access the How to Write Course Learning Outcomes webpage.

24. Do the assessments accurately evaluate the course learning goals and outcomes?

If you answered "no", sometimes assessments evaluate factors that are outside of the learning goal; this can cause a problem if the assessment method impedes the student's ability to meet the specific learning goal and allow faculty to accurately assess what the student knows. For example, if the learning goal is to examine an issue, having students write an essay that penalizes for spelling and grammar does not necessarily support the student to meet the learning goal in the best way for them. It also makes accurately assessing a student's actual knowledge of the issue challenging. Instead, consider offering assignment submission options and a rubric focused on the learning goal. In the example here a workable solution might be to allow students to examine the issue by writing an essay, creating a video, or developing a presentation. When assignment rubrics are based on the learning goals, the same rubric will be applicable to all submission options. For more assessment ideas, access the How to Develop Assessment Tasks webpage.

25. Are students provided with assignment outlines that include explicit instructions, expectations, timelines and/or grading rubrics?

    If you answered "no", assignment instructions and an explicit grading rubric allows learners to plan their time accordingly to complete the work to the best of their ability. When assignment expectations are clear, grading can be more efficient and concise. More information regarding how to create rubrics can be found on the Rubric Design webpage.

26. Are due dates clear?

    If you answered "no", clear dues dates inform students of their responsibilities and supports on time submissions. Providing dues dates in multiple areas in the course will ensure learners know what work is due and when. Consider including clear due dates on the course learning plan, in the eLearn Calendar, on each assignment outline and/or in the Dropbox.

27. Are students prompted when due dates are coming up?

    If you answered "no", prompting students in lecture, using the eLearn Calendar alerts, using the eLearn Newsfeed or emailing students about upcoming due dates supports students to complete work on time and reduces issues caused, for students and faculty, by late submissions. Prompting due dates also helps students to develop and improve their executive functioning skills for subsequent courses and semesters.

28. Are large course elements, such as modules/units or assessments, broken down into smaller sections?

    If you answered "no", providing additional time management organization supports students to use their time more effectively. If modules/units are particularly large, consider breaking down content by week, or module tasks into smaller portions. If assessments are large, consider chunking them into smaller portions and providing interim due dates. For more information on how to provide interim due dates check out the Interim Due Dates webpage.

29. Do students have opportunities to choose to work individually, in pairs or in groups?

    If you answered "no", if group work is not a course learning outcome, allowing students choice regarding if they work alone, in pairs or in groups for an assignment can relieve the anxiety group work creates for some learners, while creating greater options for collaboration for others. Consider making an individual assignment optional for a group/pairs or vice versa. Just be sure to be explicit about the assignment expectations (for example, the assignment and rubric will remain the same, capping the size of a group, etc.) to ensure additional work is not created for faculty.

30. Are instructions for assignments, quizzes, and tests presented in a way that is inclusive and supportive?

    If you answered "no", to support students to accurately account of what they know, they need to be able to understand the assignment. Having explicit and accessible assessment instructions supports learners to provide their best work. When creating instructions consider paring information to just the most important, providing a checklist of what needs to be completed and in what order, including interim dues dates to support student planning, and/or offering instructions in a number of locations to support increased access. In addition, ensuring instructions are accessible allows all students to access assignment information promptly. Instructions to create accessible documents can be found on the Accessibility Tools and Resources webpage.

Thank You

Thank you again for your interest in UDL and completing the *UDL Course Assessment*.

If you would like additional UDL information, you can:

- Attend professional development opportunities through the Centre for Teaching and Learning.
- Review the Universal Design for Learning webpages, including implementation and resources.
- Contact Darla Benton Kearney, UDL Curriculum Consultant, at darla.benton@mohawkcollege.ca or 905-575-1212 extension 3688.

If you have questions or comments regarding UDL, or this UDL Guide, please connect with Darla Benton Kearney using the contact information above.