Universal Design Best Practices:
Recommendations for Blended and Online Learning in Higher Education
with Instructure Canvas

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Abstract: Higher Education learners have become diverse with a variety of learning needs and preferences in addition to those with documented disabilities. Canada, unlike the US, does not have national legislation for providing support and access for learners with disabilities. This article identifies universal design for learning principles applications and recommendations to support learners of all abilities including those with disabilities in face to face and online classes using Instructure Canvas LMS.

Keywords: Universal Design for Learning, Instructure Canvas, Instructional Design, Differentiated Instruction

The student population in the higher education system has become increasingly diverse. Learners come with a variety of learning preferences, disabilities and needs. This could include learners with visible or invisible disabilities, language barriers, cultural differences, behavior/motivational barriers, gifted and learning preferences. This poses a challenge to instructors to enable a range of skills, needs and interests inside a single classroom. It is important to implement support strategies to meet the needs of all learners.

In 1990, the United States passed the American with Disabilities Act to protect for Americans with disabilities from discrimination. (Hong, McColl, Sampson, Schuab, 2010) Although the province of Ontario established the Accessibility for Ontarians Act in 2005, Canada does not have federal legislation in place. Canadians must rely on the 27 different statutes and various other committees to provide opportunities, access and support for individuals living with a disability. There seems to be no pressure to create an overarching federal policy from lawmakers in Canada. (Hong, McColl, Sampson, Schuab, 2010)

Individual organizations are expected to make arrangements to support and accommodate individuals. The majority of Canadian higher education institutions employ accommodations through disability support centers for learners as opposed to working together with faculty to create a more accessible environment for all students.

In higher education, a learner with a disability that requires support must self-report to the campus disability centre. The disability centre works with the learner and instructor to make arrangements for accommodations in order for the learner to succeed in the course. These accommodations are individual and applicable for only the particular learner’s needs. However, this process usually does not begin until after the course has started, which at that point, instructors have already planned the content and course for the semester and it becomes challenging to make adjustments.

Universal Design intersects with several modern educational concepts such as differentiated instruction, student centered learning, experiential learning, cooperative learning and competency-based assessment. Universal Design for Learning does not involve changing the curriculum or content, but is considered a methodology (Rose, 2010) for addressing universal access.

Background of Universal Design
Ronald Mace first introduced Universal Design in the 1960s to refer to universally designed architecture an approach that allows everyone access to buildings. Most buildings, furniture as well as educational content have always been designed for the average user of the time. Very little thought was put into consideration for those who are outliers to the average. (Rose, 2010). For example, the National Building Code of Canada recommends that the minimal step on a staircase be 21cm deep. However, over the years the average adult foot size has increased and does not fit a step resulting on numerous falls and injuries. In 2015, it was recommended that the minimum step 25cm deep which will fit the smallest and largest of foot size and making it safe and accessible for everyone (Cimachowski, 2015).

**Principles of Universal Design and applications to Canvas LMS**

Mace established principles of universal design that was used primarily in architecture and consumer design. More recently additional principles were added for learning and educational uses. The following shows the principles of universal design within the context of Canvas, a learning management system (LMS).

*Equitable Use: The design is useful and marketable to those with diverse abilities.* Example in Education: All learners of any ability, are offered equal access to the course content and learning opportunities. This can be accomplished by making the LMS course components more accessible to learners. This can be done by providing supports for visual and auditory impairments within the technology. Recommendations of use in Canvas: ability to take the course anywhere, anytime, so that learners can be in various locations, yet still be able to participate equally, as all learners will have the same level of access to the course content.

*Flexibility in Use: The design accommodates a wide range of preferences and abilities.* Example in Education: Assignments are designed so that learners can choose a format that they prefer such as to submitting as files, PowerPoint, audio voice, video, paper based etc. Recommendations of use in Canvas: ability to choose the medium to submit assignment in a variety of formats including online submissions such as video, audio/podcast, PowerPoint, graphic representation, diagrams, photo essay/journals, or website, (Hall, 2012). Canvas will accept any type of file upload, which opens up many possibilities that can accommodate majority of learners. In addition to traditional file formats using text files, consider allowing different formats for submission for multiple assignments in the course; for example: assignment #1 uses traditional text file upload; assignment #2 submission in PowerPoint or other presentation format and assignment #3 is a submission in multimedia format.

*Simple and Intuitive: The design is simple and easy to understand regardless of ability.* Example in Education: Design assignments that are clear, concise and easy to understand by all learners that remove barriers for learners. For example de-clutter course shells so that they contain less text and only include information that is necessary for learning. Recommendations of use in Canvas: Simple course design and redesign of the front page so that learners are lead to content in a simple way. It is common for instructors to post their detailed syllabus as the front page in their Canvas courses. A better method would be to create a front page using graphical icons and accompanying text for learners to access the course content immediately rather than having to look through the navigation. (Figure 1a)

Figure 1a is an example of a simple front page that is straight forward for learners to enter the content. On the other hand, Figure 1b is an example of a typical course where the syllabus is on the front page and learners have to look to the navigation bar on the left and work their way to the content.
Modules can be used to organize content into a linear modular format (Figure 1c). Modules can be organized by weeks, content, or lectures. It is best not to put in actual dates so when copying the course content from semester to semester, there is no need to individually edit each module to reflect the new dates.

Figure 1c: Modules view in Canvas LMS

Hide/disable the navigation links from learners that are not being used in the course.
Perceptible Information: The design communicates necessary information effectively to the user regardless of ability. Example in Education: Allow lectures notes to be captured by the learners and then shared with the whole class. Since every learner captures the information in a different way this would enable multiple representations catering to different learning styles. Learners who prefer visual or auditory learning can utilize Mediasite and audio lecture recording if available. Instructors can present their lecture content not only using PowerPoint presentations but through video, audio or other graphical means. Recommendation of use in Canvas:

- Integration of Mediasite and audio recordings into Canvas making access to learners easier
- Instructor’s presentation notes such as PowerPoint or Prezi in Canvas
- Instructor’s presentation in the form of a pre-recorded video presentation
- Enable the high contrast feature in Canvas
- Use colours effectively and consider all types of learners (colour and visual barriers)

Tolerance for Error: The design minimizes hazards and the adverse consequences of unintended consequences. Example in Education: Use adaptive quizzes where learners can redo the question if they respond incorrectly or allow them to respond to a question of similar difficulty if they respond incorrectly. Instructors can design assignments where learners can complete peer reviews or revise their work. Learners can consider the suggestions and make the improvements to their work before submitting a final version. Recommendation for use in Canvas: Canvas allows multiple attempts for quizzes, unlimited resubmission of online assignments and enables learners to delete and edit their online discussion content. Instructors should rethink/redesign assignments so that learners can make improvements to the work. An example would be proposal – draft – revision – final where learners receive and perform peer reviews and other peer evaluations.

Low Physical Effort: The design can be used effectively with minimal effort.
Example in Education: Design course with simple user design. Design assignments and class activities that can be easily performed by all learners. Include simple and clear instructions. Include only elements that are necessary and when possible, keep the learner inside the Canvas course website and avoid external links. Use a modular design so it is easy to navigate for all learners.
Recommendation in Canvas:

- Keep the course shells simple. Only post what is needed to enhance the student experience
- Keep the external links to a minimum
- If using third party technologies, integrate into Canvas (Student Response Systems, textbook companion)
- Use an accessibility checker (UDOIT ²)
- Enable audio input instead of text based input
- Include accessibility tools and assistive technologies to support students with disabilities
- Ensure browser compatibility checks for assistive technologies to work with browsers (ie. JAWS/Canvas)

Size and Space for Approach and Use: The design has consideration for appropriate size and space.
Example in Education: Arrange the physical classroom with tables and chairs in circles so that it is easier for everyone to move around the room. Recommendation in Canvas: Design the online environment so that it is

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[2] https://online.ucf.edu/teach-online/resources/udoit/
easy to access content. Using a simplified approach, direct learners to content using links rather than letting them find the content themselves. If you are using a customized front page, make a link directly to assignments or discussions. Although there are no limitations in the virtual space for the number of users, the online space can become crowded with decorative content or additional optional resources. Post only necessary content on the front page, then direct learners to the essential elements. If you are using the online space as a place for optional resources in their own modules so they do not clutter up the content area.

**Online and learning environment supports**

**Community of Learners: The design promotes interaction and communication amongst student and instructors.** Recommendation for use in Canvas: Use discussion boards and synchronous collaboration tools such as Blackboard Collaborate, Etherpad, GoogleDocs, as well as external tools such as Jabber, Slack or other instant messaging tools to cultivate a community for the learners (especially for fully online programs to avoid isolating learners). Utilize social media and other social platforms to connect online learners together such as student groups areas, virtual office meetings between students and instructor using external synchronous tools as well as Canvas specific tools.

**Instructional Climate: Design instruction to be welcoming and inclusive. High expectations are espoused for all students.** Example in Education: Design the classroom so that it is welcoming, inclusive and respectful to all learners. Maintain high expectations and standards equally for all learners and use methods that will benefit all learners equally. Recommendations for use in Canvas: Regularly engage with students through the use of messaging, participation in discussion, prompt feedback of assignments, live lectures (ie. Adobe Connect/BB Collaborate)

**Conclusion**

Instructors can start off by implementing some of these the principles and increasing their use in their course design over time. A simple change can make a significant impact on students. For example, the visual learner who struggles with text-heavy elements would be able to draw on their creativity and fulfill course requirements using flexible multimedia tools. Instructors would need to take a look at parts of their current practice and content and decide where universal design strategies can be integrated most successfully. There should also be willingness on the instructor to experiment. There would be times when the principle(s) will not work for the class; other times they will work perfectly.

Widespread adoption of the universal design principles will be a challenging process especially without any federal legislation that mandates access for all. However, universal design can help provide equal access that benefits all learners without entailing an excessive amount of work. These examples illustrate how these principles can be used in Canvas or any other learning management systems to provide flexibility and choice to students and instructors.

**References**


