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<cn>5.<em><ct>Creating inclusive online learning for business students with disabilities

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Providing online courses which are non-discriminatory and accessible is not only an ethical approach, it is also a legal obligation for many universities. Offering online content and learning experiences which are inclusive for students with disabilities may challenge business faculty. Increasingly diverse student cohorts, large class sizes, and new pedagogical approaches are just some of the factors to be considered. As a consequence, lecturers must make informed choices regarding both pedagogy and educational technologies.

One strategy which supports the ideal of inclusive learning and teaching within higher education is universal design for instruction (UDI). This provides a framework for creating learning environments with greater accessibility for all students, including those with disabilities. While not replacing academic adjustments intended to meet the specific needs of an individual, UDI does address common barriers experienced by those with a disability. As a result, UDI may reduce the number of adjustments required for both on-campus and online students. Universal design for instruction is also recommended as a means of modelling inclusive practice for university students (Oswald et al. 2018; Rogers-Shaw et al. 2018). This chapter discusses the application of UDI as a framework for business lecturers teaching online. Practical advice for inclusive learning and teaching is also offered.

<a>EDUCATIONAL MODELS OF UNIVERSAL DESIGN

The term universal design (UD) refers to the design of products and environments to be usable by all people to the greatest extent possible, without the need for adaptation or specialized design (Center for Universal Design 1997). Based on the belief that designers

have a responsibility to consider diversity (McGuire and Scott 2006), universal design for learning (UDL) is underpinned by three basic ideals:

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1.<em>It must provide the student with multiple means of representation, that is, the content is presented in different ways.

2.<em>It must provide multiple forms of expression, that is, the student must be able to demonstrate their learning in different ways.

3.<em>It must provide multiple methods of engagement, that is, students are motivated to learn in different ways. (Center for Applied Special Technology 2019).</list>

In 1997, the Center for Universal Design (CUD) at North Carolina State University produced seven principles describing accessible environments. These principles are (1) equitable use; (2) flexibility in use; (3) simple and intuitive; (4) perceptible information; (5) tolerance for errors; (6) low physical effort; and (7) size and space for approach and use (Aslaksen et al. 1997). Considered relevant for educational environments, Rose, Meyer, and others from the Center for Applied Special Technology (CAST) described the application of these principles to education as UDL (Rogers-Shaw et al. 2018). Two more principles, (8), community of learners, and (9) instructional climate, were later proposed to specifically address the needs of adult learners by fostering ongoing engagement (Scott et al. 2001). Collectively these nine principles form the UDI framework.

<a>EXAMPLES OF APPLICATION

Dean et al. (2017) focused on the three basic ideals of UDL to deliver a large, on-campus introductory marketing course. They used tools such as PowerPoint, online quizzes, and a student response system (also known as clickers or polling apps) to provide students with multiple means of representation, expression, and engagement. They found that such an

approach empowered students to take responsibility for their own learning (Dean et al. 2017). Similarly, Houston (2018) draws on the three guiding ideals, although she applies them to the lifecycle of an online course: design, development, and delivery. Houston's practical advice underpins the belief that UDL can enable faculty to consider the needs of a diverse cohort and, as a consequence, create a more inclusive learning experience. Also, focusing on the three guiding ideals, Boothe et al.'s (2018) recent literature review suggests the implementation of UDL could address the needs of students while also meeting US federal laws; including the 2008 Higher Education Opportunity Act.

Burgstahler (2016) draws on the three ideals and the original seven principles developed by CUD to provide educators with a design checklist. Published by the University of Washington, this checklist offers practical advice regarding class climate, effective interactions, delivery methods, the use of technology, and assessment practice. Together with strategies applicable for both on-campus and online curriculum delivery, Burgstahler also presents suggestions for communicating with students who have disabilities.

Examples of university lecturers implementing all nine UDI principles can also be found. Oswald et al. (2018) present clear, practical advice on implementing UDI within online rehabilitation courses. They stress that designing and delivering university courses based on principles of UDI, models inclusive professional practice for students. Ultimately, this produces graduates who may foster similar communities within their own careers.

<a>IMPLEMENTING THE NINE UDI PRINCIPLES

This section assists those wishing to develop and teach inclusive online courses through UDI. To do this, each of the nine UDI principles are defined (Scott et al. 2001) with brief examples of application (see Table 5.1). This is followed by a more in-depth discussion of each principle. The first four principles align to the development of curriculum and content. Since

online delivery is being considered, it is suggested principles three and four be read in conjunction with the 'Web content accessibility guidelines (WCAG) 2.0' (or WCAG2.0) (W3C 2008). While the remaining principles relate more to teaching practice, the final two (8, community of learners, and 9, instructional climate) are of particular importance within higher education as they cover the needs of self-directed adult learners.

<PLEASE INSERT TABLE 5.1 ABOUT HERE>

Throughout this discussion, readers are directed to relevant online resources. The chapter concludes with a list of university websites promoting inclusive learning and teaching. These include examples of good practice, online professional development and related resources.

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<caption>Table 5.1<em>The nine principles of universal design for instruction, as defined by Scott et al. (2001), with examples of application to online courses

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Principle	Definition	Examples of application within online courses
1. Equitable use	Instruction is designed to be useful to and accessible by people with diverse abilities. Provide the same means of use for all students; identical	Select textbooks which are available in multiple formats (hardcopy, eBooks, and audiobook) whenever possible If presenting an online lecture using PowerPoint, use one of an 'Accessible' templates and share 'slides' beforehand

	whenever possible, equivalent when not	
2. Flexibility in use	Instruction is designed to accommodate a wide range of individual abilities. Provide choice in both instructional methods and learning experiences	Present content in small chunks (Elias 2010). For example, onscreen text (as in LMS pages) is presented in a series of short modules. If using case studies, students are given short readings with images that tell the story Students are allowed to respond to questions in various ways. For example, if conducting an online lecture or webinar, collect student questions beforehand, then use the chat feature as well as polling tools during the session
3. Simple and intuitive	Instruction is designed in a straightforward and predictable manner, regardless of the students' experience, knowledge, language skills, or current concentration level. Eliminate unnecessary complexity	The LMS site has a simple layout and navigation design which is used consistently so students can easily predict where things are At the beginning of each topic presented within the LMS, key concepts are listed. Each topic concludes in a similar way Links to general resources (library, academic support) are placed where students can easily find them

4. Perceptible information	Instruction is designed so that necessary information is communicated effectively to the student, regardless of ambient conditions or the student's sensory abilities	Build all webpages in compliance with WCAG2.0 standards Use LMS accessibility tools to ensure content is accessible by screen readers. (Canvas Accessibility Checker, BlackBoard Ally, Moodle Atto)
5. Tolerance for errors	Instruction anticipates variation in individual student learning pace and prerequisite skills	Provide students with formative assessment tasks which facilitate self-assessment. This could include online quizzes which allow multiple attempts Consider using online simulations, such as HBPE to provide students with opportunities to assume a professional role and make decisions which relate to their career aspirations. Such simulations should be accessible to those using assistive technologies (check with the publisher)
6. Low physical effort	Instruction is designed to minimize non-essential physical effort in order to allow maximum	'Chunking' of content

	attention to learning. This includes not only the physical efforts but also the energy that goes into cognitive and decoding tasks *Note:* This principle does not apply when physical effort is integral to essential requirements of a course	
7. Size and space for approach and use	Instruction is designed with consideration for appropriate size and space for approach, reach, manipulations, and use regardless of a student's body size, posture, mobility, and communication needs	
8. Community of learners	The instructional environment promotes	Establish protocols which acknowledge the ability of students as well as their

	interaction and communication among students and between students and faculty	responsibility as adult learners. For example, when it comes to general inquires, ask students to post their questions on a cohort-wide discussion forum for their peers to respond to before asking the teaching staff (Boothe et al. 2018) Depending on class size, students could be given the opportunity to co-facilitate webinars, or moderate discussion boards relating to particular topics
9. Instructional climate	Instruction is designed to be welcoming and inclusive. High expectations are espoused for all students	The lecturer creates a welcome video introducing the course and talks about their personal and professional interest in the area. The lecturer also speaks about what is expected from the students and what the students should expect from each other and from him or her. (Reminder: all videos include transcripts. In this case it could be the script a lecturer is reading from)

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Note:<em>LMS = learning management system; HBPE = Harvard Business Publishing Education.

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<b>1.<em>Equitable Use

The first principle of UDI asks that all students have an equal opportunity to learn. By providing learning materials in multiple formats, such as textbooks which are available as audio books, and recorded lectures which have captions (or transcripts), students with sight or hearing impairments are provided an equivalent learning experience. While this may seem obvious when preparing content, it might become more problematic when planning communication strategies and assessment tasks.

Providing alternative formats to videos is one example of equitable practice, since they afford students with hearing difficulties an equitable experience. If publishing a video via YouTube, subtitles should be inserted. Options to do so can be found with YouTube's 'video manager' menu. While the process is simple, the text which is automatically generated will no doubt require editing. If a video creator or publisher has enabled contributions, others can add subtitles, transcripts, or translations.

Communications between the lecturer and students, as well as student to student, should be carefully considered. If conducting live webinars with students using tools such as Zoom or Adobe Connect, check the accessibility features are enabled. Inform students about these tools and encourage them to go through the set-up prior to the first session. It may be beneficial to run a short practice session to ensure everyone can participate.

Provide a statement on the learning management system (LMS) homepage which acknowledges the effort made to provide an equitable learning experience and invite those who experience problems to seek assistance. Also, assure students that these requests remain private and confidential.

<b>2.<em>Flexibility in Use
Depending upon the situation, flexibility could relate to multiple means of representation, expression, or motivation. In many ways, this principle is closely related to the first principle,

equitable use. Since some aspects of equity are achieved through the provision of alternative formats (for example, transcriptions for video or audio) resources may also provide students with choice. Take, for example, a video with an accompanying transcript. The transcript would provide those with a hearing impairment access to the content. Other students may decide that reading the transcript is a more effective way for them to learn. They may scan the document for keywords, run it through a translation program, or print it out and highlight important sections.

Learning management system content (such as modules) should provide students with options around when and how often they access materials. Carefully consider the amount of onscreen reading students are given. If, for example, the modules include large amounts of text, break that text into smaller sections and support the content with diagrams or photographs. This will allow students to gain an understanding in various ways. The content should also be organized so students can easily revisit information.

Providing flexibility so student-to-lecturer or student-to-student communication can be achieved through the combined use of synchronous and asynchronous communication tools. Participating in a live webinar may be challenging for some students. Aside from barriers students may have with technology, it is possible that any student may have conflicting commitments and, as a consequence, miss a session. Allowing students to post questions or comments on a discussion board prior to a webinar could provide the required flexibility. During the webinar, the lecturer could deal with the earlier posted questions and record the session for the class. By doing this, students could have the option of asking questions before or during the webinar. During the webinar students might prefer to communicate using a chat feature or, if the class size was small enough, perhaps the lecturer would give students microphone usage rights. In these instances the webinar should include captioning, if available.

Flexibility should also be apparent in assessment. For example; if a learning objective requires students to explain a business process, they might be allowed to submit their work in a traditional essay format or as a series of diagrams, detailed instructions, a presentation, or a video. This type of approach relates to the more general ideal of allowing students to express themselves in multiple ways. Providing flexibility within assessment tasks may be particularly challenging as lecturers could see it as creating an additional workload for staff in completing feedback and grading. Moderation of assessments which have more than one possible submission format is not as straightforward as a typical essay or examination administered to all students. For this it is suggested lecturers provide additional information within assessment rubrics to explain these options in detail.

<b>3.<em>Simple and Intuitive

Adhering to this principle within online delivery means to be conscious of basic web design principles and how they assist students with diverse needs. Keeping navigation simple and consistent is fundamental. This practice should be applied to the presentation of learning materials and to the organization of discussion boards or other communication tools. Many universities provide guidance relating to the creation of online learning materials. A selected list is presented later in this chapter.

When creating content, text should be written using styles (for example, Heading 1, Heading 2, Body) found in Word or LMS text editors. This consistency not only makes the content look professional, it also assists those using screen readers; the student may skim read from section to section based on the heading levels. When organizing content, for example, within modules, be consistent and keep layouts simple. One suggestion is to begin each topic with a listing of the key concepts and to conclude the topic in a similar manner. Similar to

teaching in a traditional classroom, this practice allows the lecturer to state what students should learn, then deliver the lesson, and finally recap to ensure student comprehension.

Navigation should be simple and intuitive. Students should be able to predict where things are within the LMS. Lecturers often are given LMS templates which address these considerations. When building content from scratch outside of the LMS, look for templates designed with accessible features (for example, colour contrasts that are friendly to colour-blind students). For example, Microsoft provide accessible templates for Word, Excel and PowerPoint.

Scott et al. (2003) write about presenting assessment information and syllabus in simple and intuitive ways as well. They suggest inclusion of a grading rubric and clear assessment expectations. As the production of a course syllabus is automated within many universities, an accessible portable document format (PDF) of such a document should be provided. Posting an announcement to students reminding them of this document's importance and inviting questions is recommended. This practice relates to other principles, including that of building community and a positive instructional climate.

<b>4.<em>Perceptible Information

This principle asks that all information is communicated effectively to students. This includes LMS content and ongoing communications conducted using tools such as the discussion board or webinars (for example, Zoom). It should not be assumed that all students can perceive information by simply using enterprise solutions such as a university's LMS or online conferencing tool. Kent's (2016) investigation into the experience of students with disabilities enrolled in Open Universities Australia found these enterprise tools particularly problematic.

When considering online delivery, this principle should be read in conjunction with WCAG2.0 (see Table 5.2). Adhering to the WCAG2.0 standards will make content accessible to a range of people with disabilities, including blindness and low vision, deafness and hearing loss, learning disabilities, cognitive limitations, limited movement, speech disabilities, photosensitivity, and combinations of these. Following these guidelines often makes web content more usable for all (W3C 2016).

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The WCAG documentation provides several layers of information. It includes four principles of accessibility: (1) perceivable, (2) operable, (3) understandable, and (4) robust. Each principle has a short list of guidelines which provide basic goals for web developers. Success criteria for each guideline may be achieved at one of three levels: A (lowest), AA, and AAA (highest). This allows for compliance testing and ratings. Techniques which demonstrate compliance as well as non-compliance for each guideline are provided on the W3C website (W3C 2016). As a result, WCAG2.0 can be used as both a tool in developing or assessing the accessibility of online courses.

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<caption>Table 5.2<em>The WCAG2.0 standards

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Principles of accessibility	Guidelines which address each principle
1. Perceivable: people can see or hear the content	Add alternative text to images and other visuals
	Close caption videos or provide transcripts
	Provide sufficient colour contrast between text and its background

	Make sure content does not rely on colour alone
2. Operable: people can use the computer by typing or by voice	Provide a clear structure with properly marked up headings
	Create descriptive links that make sense out of context
	Provide sufficient time for interaction and response
	Avoid content that can trigger seizures
3. Understandable: clear and simple language	Clarify expectations through clear directions and models
	Follow conventions to ensure a predictable and consistent experience
	Use plain language
	Indicate the language of your content
4. Robust: meaning people can use different assistive technologies	Add metadata to make content easier to find and use
	Perform an accessibility check
	Perform basic assistive technology testing

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Source:\<em\>Adapted from W3C (2008).

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As the WCAG2.0 standards are an internationally recognized model for addressing issues of accessibility, they should be adhered to when creating any online delivery. Owing to this, accessibility checkers are a valuable resource. LMS accessibility checkers, as well as those found in commonly used online learning tools, also observe these standards. This includes Microsoft Word, Excel, and PowerPoint. If the feature is selected, the author will be presented with 'inspection results' and 'steps to fix' the issues. Microsoft also provide accessible templates based on the WCAG standards, which can be downloaded (see the list of resources in Box 5.1).

Siteimprove and Wave (Box 5.1) are two freely available website accessibility diagnostic tools. Again, based on the WCAG standards, these tools analyse websites, identify problems, and indicate the appropriate WCAG guideline. Another process for testing the perceivability, and resulting accessibility of a website, is to open it within a screen reader. For those who have never heard a screen reader in action, this is quite an interesting experience. Problems with both navigation and content become apparent. Two freely available screen readers are named in Box 5.1.

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<bh>BOX 5.1<em>ONLINE RESOURCES RELATING TO UDI PRINCIPLE

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<bt><em>Microsoft (2019), 'Get accessible template for Office': accessed 22 August 2019 at https://support.office.com/en-us/article/get-accessible-templates-for-office-ca086caa-2bd2-4ac8-8c12-4cd495bd4d76.

<bt><em>The University of Auckland, 'Inclusive design for online accessibility' (poster): accessed 16 August 2019 at https://www.auckland.ac.nz/en/staff/learning-and-teaching/clear/resources-for-teaching/inclusive-design.html. A PDF poster detailing considerations for constructing online content can be downloaded from this site as an open educational resource (OER).

<bt><em>Siteimprove Accessibility Checker (Google Chrome extension): accessed at https://support.siteimprove.com/hc/en-gb/articles/115002413812-Siteimprove-Accessibility-Checker-Chrome-Extension.

<bt><em>Wave (Website Accessibility Evaluation Tool): accessed at

https://wave.webaim.org/.

<bt><em>Screen readers (free):

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– download from 'NV Access: empowering lives through non-visual access to technology',

accessed at https://www.nvaccess.org/download/; and

– Apple VoiceOver, accessed at

https://www.apple.com/au/accessibility/mac/vision/.</sbl></list>

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Note:<em>All websites accessed 12 November.

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While considerations towards addressing this principle have focused on content, lecturers should also be aware of information posted throughout the semester, such as announcements and discussion board postings. The same rules of compliance should be applied.

<b>5.<em>Tolerance for Errors

This principle asks that students be given opportunity to practise. In online delivery this can be achieved through multiple-choice question quizzes. Quizzes which allow for multiple attempts as well as guidance (hints) as to how students might address knowledge gaps are particularly useful. When designing these quizzes, select a radio button response format if possible. This format is more easily read by screen readers.

Online simulations, such as Harvard Business Publishing Education (HBPE) simulations can also provide students with the opportunity to practise skills or apply new

knowledge in a way that allows for errors. This is because simulations often allow students to assume the role of a professional and to address real-world problems, without the real-world consequences. If using an online simulation, it is important to take advice from a disability support staff member.

<b>6.<em>Low Physical Effort

Providing learning experiences which require a minimal amount of physical effort are perhaps more obvious in the traditional classroom. Burgstahler's (2019) example of lecture theatre doors which open automatically is one instance. Similarly, Scott et al. (2003) suggest allowing students to use a computer during an examination, as an alternative to writing with pen and paper, as this could assist those with fine-motor skill difficulties. Applying this consideration to online courses may not be as obvious.

Being mindful of potential eye-strain from reading on screen is an interpretation of this principle within online learning. With this in mind, it is recommended that text be presented in short paragraphs and written in a less formal style than typically found in textbooks. Ko and Rossen (2017) suggest the inclusion of images, graphics and links to related resources be interspersed within the content. By breaking text up in this way, students may find it easier to read. This strategy also relates closely to principle 2, flexibility in use, and principle 3, simple and intuitive.

There may be times when this principle cannot be adhered to. Scott et al. (2001) notes that this principle does not apply when physical effort is integral to successfully completing the coursework. For example, there may be practical duties students on work placements must perform. In these instances, the disability support staff should be consulted.

<b>7.<em>Size and Space for Approach and Use

Application of this principle to online delivery is limited. The original intent is that of supporting all students in the classroom by being mindful of furnishings, communication needs, body sizes, and personal space. Scott et al. (2003) write of the importance of lecturers facing the class when they speak. This could be interpreted in the online space as intentionally using a webcam when conducting online meetings or webinars so students can see the lecturer's face.

<b>8.<em>Community of Learners

These last two principles (8 and 9) are particularly important for adult learners and are highly relevant within online delivery. Rovai (2002) describes a learning community as having four dimensions: spirit, trust, interaction, and common expectations or learning goals. He goes on to suggest lecturers who teach online address these dimensions by "attending to seven factors: transactional distance, social presence, social equality, small group activities, group facilitation, teaching style and learning stage, and community size" (Rovai 2002, p. 12). Rovai's advice not only provides guidance to those teaching online, it also aligns neatly with several UDI principles.

While the importance of this principle cannot be overstated, achieving a sense of community does not need to be an onerous task for the lecturer. Providing students with the opportunity to draw on their personal and professional experiences is one effective way of building community, and is particularly relevant in postgraduate studies. Lohr and Haley (2018) used biographical prompts to provoke discussion-board postings from postgraduate students. They found this strategy increased communication and engagement within the cohort.

While the lecturer does need to set the tone and provide motivation for peer interaction, a great deal of the effort in building community comes from students. Some strategies to foster a sense of community include the following:

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<bt><em>Ask students to introduce themselves using a specific discussion-board forum. The introduction could include a simple prompt, such as recommending a novel or podcast to their classmates. This helps creates community while also ensuring students can access the basic communication tools.

<bt><em>Allow students to self-enrol into groups based on common interests or topics of study within the course.

<bt><em>Give access to or suggest synchronous meeting tools to students (for example, Zoom or Adobe Connect) and allow them to organize study times.

<bt><em>Ask students to upload useful resources relating to research tasks.

<bt><em>Extend the idea of 'community' beyond the course, by introducing students to university clubs or services.</list>

<b>9.<em>Instructional Climate

The instructional climate is important in every educational setting. As noted by Grier-Reed and Williams-Wengerd (2018, p. 3), lecturers have the "responsibility and privilege of designing an inclusive classroom space". When considering the needs of students with disabilities, this principle is critical. Take, for example, an Australian study which found that students with disabilities attributed most of their barriers to academic success to external factors, such as being misunderstood by lecturers, unsupportive attitudes of administrative staff, inaccessible course materials, and even peer ridicule (Ganguly et al. 2015). With that in

mind, those who are teaching online should aim to provide a positive, inclusive online environment for all students.

Lecturers can create a positive climate in several ways. Again, this could be achieved though small but meaningful actions. For example, the lecturer could make a 'welcome' video in which he or she discusses the course and sets high expectations around academic achievement and peer interaction. The instructor could also speak of their intention to be inclusive and invite feedback from the students. Burgstahler (2016) offers several strategies for creating a positive class climate. This includes providing clear details of the expectations placed upon students, welcoming questions from students, and ensuring the lecturer is available for online consultation.

Box 5.2 contains a list of university websites promoting inclusive learning and teaching.

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<bh>BOX 5.2<em>UNIVERSITY WEBSITES PROMOTING INCLUSIVE ONLINE PRACTICE

Several universities publicly provide guidance for lecturers wishing to be more inclusive in their teaching. They provide examples of good practice, online professional development and general resources. Examples include:

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<bt><em>Colorado State University (n.d.), 'ACCESS to postsecondary education through universal design for learning': https://accessproject.colostate.edu/udl/.

<bt><em>Durham College (2019), 'Curriculum development: universal design for learning':
http://cafe.durhamcollege.ca/index.php/curriculum-development/universal-design-for-learning/home-page.

<bt><em>Harvard University (2019), 'Inclusive moves', the Derek Bok Centre for Teaching and Learning: https://bokcenter.harvard.edu/inclusive-move this resource speaks both the curriculum design and teaching practice.

<bt><em>Indiana University (2019), 'Create accessible canvas sites':
https://kb.iu.edu/d/bfjh#canvasgeneral. This site provides practical guidance for various canvas tools.

<bt><em>University of Arkansas, Little Rock (n.d.), 'Ten steps toward universal design of online courses': https://ualr.edu/disability/online-education/. This site provides clear guidance around creating content and using tools such as quizzes and chat.

<bt><em>University of California, Davis (n.d.), 'Accessibility for online courses':
https://canvas.ucdavis.edu/courses/34528/pages/accessibility-for-online-courses. Part of a larger online program for lecturers teaching online, this module steps through the process of improving the accessibility of online courses. Created in Canvas, this is also an example of good practice.

<bt><em>University of Minnesota (2019), 'Accessible U: design for all people. All devices':
https://accessibility.umn.edu/start-small-start-now. This comprehensive website explains core ideas relating to accessibility and provides a variety of information on web development, Moodle or Canvas use.

<bt><em>University of Nebraska (n.d.), 'Designing accessible online courses':
https://canvas.unl.edu/courses/27068. The University of Nebraska have made public a self-paced online course. This includes some legislative information as well as practical advice

<bt><em>University of Washington (2019). *Online Course Accessibility Checklist:* https://depts.washington.edu/uwdrs/faculty/online-course-accessibility-checklist/. Along with the checklist, this site includes links to further resources useful to those using Word, PowerPoint and Excel

<bt><em>Washington State Board for Community and Technical Colleges, Library of accessible resources: https://sbctc.instructure.com/courses/1578604. Created in Canvas, this OER provides a comprehensive guide to creating accessible Canvas content as well as PowerPoint presentations, PDFs and email communications to students.

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Note:<em>All websites accessed 12 November.

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<a>CONCLUSION

Accepting the notion that UDI offers a framework for inclusive university learning and teaching, this chapter aims to provide practical guidance for educational designers and lecturers within business disciplines. By drawing on recent educational studies (Kent 2016; Dean et al. 2017; Boothe et al. 2018; Houston 2018; Oswald et al. 2018), and disability research (Ganguly et al. 2015; Burgstahler 2016; Massengale and Vasquez 2016; Evans et al. 2017) examples of good practice have been presented. It is argued that by designing and teaching with the intention of increasing accessibility for students with disability, all students benefit.

<a>REFERENCES

Aslaksen, F., S. Bergh, O.R. Bringa and E.K. Heggem (1997), 'Universal design: planning and design for all', accessed 12 November 2019 at https://digitalcommons.ilr.cornell.edu/gladnetcollect/327/.

Boothe, K.A., M.J. Lohmann, K.A. Donnell and D.D. Hall (2018), 'Applying the principles of universal design for learning (UDL) in the college classroom', *Journal of Special Education Apprenticeship*, **7** (3), 1–13.

Burgstahler, S. (2016), 'Equal access: universal design of computer labs; a checklist for making computer labs welcoming, accessible, and usable', accessed 12 November 2019 at https://www.washington.edu/doit/sites/default/files/atoms/files/EA_Computer_Labs.pdf.

Burgstahler, S. (2019), 'Universal design of instruction (UDI): definitions, principles, guidelines, and examples', accessed 12 November 2019 at https://www.washington.edu/doit/universal-design-instruction-udi-definition-principles-guidelines-and-examples.

Center for Applied Special Technology (2019), 'The UDL guidelines', accessed at http://udlguidelines.cast.org/?utm_medium=web&utm_campaign=none&utm_source=cast-about-udl.

Center for Universal Design (1997), 'About UD', North Carolina State University, Raleigh, NC, accessed 8 February 2019 at https://projects.ncsu.edu/ncsu/design/cud/about_ud/udhistory.htm.

Dean, T., A. Lee-Post and H. Hapke (2017), 'Universal design for learning in teaching large lecture classes', *Journal of Marketing Education*, **39** (1), 5–16.

Elias, T. (2010), 'Universal instructional design principles for Moodle', *International Review of Research in Open and Distributed Learning*, **11** (2), 110–24.

Evans, N., E. Broido, K. Brown and A. Wilkie (2017), *Disability in Higher Education: A Social Justice Approach*, San Francisco, CA: Jossey-Bass.

Ganguly, R., C. Brownlow, J. DuPreez and C. Graham (2015), 'Resilience/thriving in post-secondary students with disability: an exploratory study', accessed 12 November 2019 at https://www.ncsehe.edu.au/publications/resiliencethriving-in-post-secondary-students-with-disabilities/.

Grier-Reed, T. and A. Williams-Wengerd (2018), 'Integrating universal design, culturally sustaining practices, and constructivism to advance inclusive pedagogy in the undergraduate classroom', *Education Sciences*, **8** (4), art. 167.

Houston, L. (2018), 'Efficient strategies for integrating universal design for learning in the online classroom', *Journal of Educators Online*, **15** (3), 1–16.

Kent, M. (2016), 'Access and barriers to online education for people with disabilities, report submitted to the National Centre for Student Equity in Higher Education (NCSEHE)', accessed at https://www.ncsehe.edu.au/publications/access-and-barriers-to-online-education-for-people-with-disabilities/.

Ko, S. and S. Rossen (2017), *Teaching Online: A Practical Guide*, New York: Routledge.

Lohr, K.D. and K.J. Haley (2018), 'Using biographical prompts to build community in an online graduate course: an adult learning perspective', *Adult Learning*, **29** (1), 11–19.

Massengale, L.R. and E. Vasquez III (2016), 'Assessing accessibility: how accessible are online courses for students with disabilities?', *Journal of the Scholarship of Teaching and Learning*, **16** (1), 69–79, doi:10.14434/josotl.v16i1.19101.

McGuire, J. and S. Scott (2002), 'Universal design for instruction: a promising new paradigm for higher education', *Perspectives*, **28** (2), 27–9.

McGuire, J.M. and S.S. Scott (2006), 'Universal design for instruction: extending the universal design paradigm to college instruction', *Journal of Postsecondary Education and Disability*, **19** (2), 124–34.

Oswald, G.R., N. Adams, R. David and J.A. Hiles (2018), 'Universal design for learning in rehabilitation education: meeting the needs for equal access to electronic course resources and online learning', *Journal of Applied Rehabilitation Counseling*, **49** (1), 19–22.

Rogers-Shaw, C., D.J. Carr-Chellman and J. Choi (2018), 'Universal design for learning: guidelines for accessible online instruction', *Adult Learning*, **29** (1), 20–31.

Rovai, A.P. (2002), 'Building sense of community at a distance', *International Review of Research in Open and Distance Learning*, **3** (1), 1–16.

Scott, S., J. McQuire and S. Shaw (2001), *The Principles of Universal Design for Instruction*, Storrs, CT: University of Connecticut, Center on Postsecondary Education and Disability.

Scott, S., J. McQuire and S. Shaw (2003), 'Universal design for instruction – a new paradigm for adult instruction in postsecondary education', *Remedial and Special Education*, **24** (6), 369–79, doi:10.1177/07419325030240060801.

W3C (2008), 'Web content accessibility guidelines (WCAG) 2.0', December, accessed 14 April 2020 at https://www.w3.org/TR/WCAG20/#intro-layers-guidance.

W3C (2016), 'Understanding WCAG 2.0: a guide to understanding and implementing WCAG 2.0', accessed 12 November 2019 at https://www.w3.org/TR/UNDERSTANDING-WCAG20/intro.html#introduction-fourprincs-head.