

INTEGRATING UDL PRINCIPLES AND PRACTICES INTO THE ONLINE COURSE  
DEVELOPMENT PROCESS: A DELPHI STUDY

by

Korey J. Singleton  
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## **Dedication**

This is dedicated to my beautiful wife, Ericka; our healthy, bouncing boys, Xavier and Tristan; and our dogs, Miles and Bru.

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## List of Abbreviations

Americans with Disabilities Act .....	ADA
Attention Deficit Disorder .....	ADD
Attention Deficit Hyperactivity Disorder .....	ADHD
Center for Applied Special Technology .....	CAST
Constant Comparative Analysis.....	CCA
Course Observation Instrument .....	COBI
Center for Teaching and Faculty Excellence .....	CTFE
Electronic and Information Technology .....	EIT
Florida State University .....	FSU
Inclusive Teaching Strategies Inventory .....	ITSI
Individuals with Disabilities Education Act .....	IDEA
Instructional Designer .....	ID
Institute of Education Science .....	IES
Information Technology .....	IT
Interquartile Range .....	IQR
Learning Management System .....	LMS
Massachusetts Institute of Technology .....	MIT
Massive Open Online Courses.....	MOOC
National Council on Disability .....	NCD
National Federation of the Blind.....	NFB
Distance Education .....	DE
Penn State University.....	PSU
Science, Technology, Engineering, and Math .....	STEM
Telecommunications device for the deaf .....	TDD/TTY
Twenty-First Century Video and Communications Accessibility Act .....	CVAA
Universal Design.....	UD
Universal Design for Instruction.....	UDI
Universal Design for Learning.....	UDL
Universal Instructional Design .....	UID
United States Department of Education, Office of Civil Rights .....	OCR
United States Department of Justice .....	DOJ
United States Government Accountability Office .....	GAO
Virtual Learning Environment.....	VLE
World Content Accessibility Guidelines .....	WCAG

## **Abstract**

### **INTEGRATING UDL PRINCIPLES AND PRACTICES INTO THE ONLINE COURSE DEVELOPMENT PROCESS: A DELPHI STUDY**

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Dissertation Director: Dr. Kevin Clark

The literature shows that both faculty and students hold favorable opinions about UDL principles and practices (Dallas, Upton, & Sprong, 2014; Davies, Schelly, Spooner, & University, 2013; Izzo, Murray, & Novak, 2008; Izzo et al., 2008; Schelly, Davies, & Spooner, 2011; Seok, DaCosta, Kinsell, & Tung, 2010) and students' benefit from such practices when implemented in the higher education classroom (Wilson, Boyd, Chen, & Jamal, 2011). Despite this, faculty members remain resistant to implementing UDL principles and practices (Lombardi & Murray, 2011). Few studies have examined the barriers impacting the adoption of UDL principles and practices by higher education faculty (Moriarty, 2007), and even less have offered solutions which would improve adoption.

Using a modified, four-round decision-making Delphi method, this study successfully developed and refined a course observation tool that (a) integrates the principles of UDL and (b) improves faculty adoption and awareness of UDL strategies at a 4-year research university in the Commonwealth of Virginia (Appendix Q). Techniques were also identified that have been successful in “disarming” the resistance that many faculty members have toward the inclusion of UDL strategies (i.e., consistency, prescriptive approach, focus on inclusive design) in their courses. These findings lay the groundwork for the standardization of online course development practices at this university and for broad adoption of UDL strategies by instructional faculty teaching online courses.

## **Chapter One: Introduction**

The purpose of this dissertation is to develop and refine a course observation tool that (a) integrates the principles of Universal Design for Learning (UDL) and (b) improves faculty awareness of UDL strategies. Long term, it is anticipated that implementing the tool would improve faculty adoption of UDL strategies, thus improving access to the online educational curriculum for postsecondary students with disabilities (SWDs). Studies have demonstrated the perceptual and tangible benefits to both faculty and students, including those with disabilities, when UDL practices and principles are implemented in the online classroom (Bongey, Cizadlo, & Kalnbach, 2010; Parker, Robinson, & Hannafin, 2007; Rao & Tanners, 2011).

This chapter will introduce the general issues surrounding access to online learning for SWDs, the current disability legislation, and the legal challenges impacting educational technology in postsecondary education. Additionally, I will discuss the current state of online learning at the university, the purpose of this study, the research questions, and the definition of terms.

### **Statement of the Problem**

The percentage of students enrolled in postsecondary institutions that reported having a disability increased from approximately 6% in 1995 to 11% in 2009 (National Council on Disability, Social Security Administration, 2000, U.S. Government

Accountability Office, 2009). In addition to greater enrollment numbers, a report from the Institute of Education Science's 2011 Digest of Education Statistics [IES] (Snyder & Dillow, 2012) shows that there is also greater variation in the types of disabilities being disclosed. Nearly two-thirds of SWDs enrolled in postsecondary education reported having a learning/cognitive and/or psychological disability (e.g., dyslexia, dysgraphia, Attention Deficit Disorder/Attention Deficit Hyperactivity Disorder [ADD/ADHD], mental illness/psychological or psychiatric conditions), approximately 11% had a health-related impairment, and approximately 7% had a sensory impairment (i.e., visual and/or hearing impairments) (Raue & Lewis, 2011). While some sources attribute this growth to the increased emphasis on special education resources in K-12 over the past few decades (Wagner, Newman, Cameto, & Levine, 2005), others add that improved legislation for individuals with disabilities deserves the credit (Wessel et al., 2009).

Regardless of the reasoning as to why there are increases, graduation rates for these populations have not kept pace. Many postsecondary education institutions have begun to examine ways to improve the retention rates of this population (Mamiseishvili & Koch, 2011). To date, research on how best to support SWDs in postsecondary education is heavily weighted toward understanding faculty attitudes and perceptions about supporting SWDs in the face-to-face classroom (Baker, Boland, & Nowik, 2012; Dy, 2005; Hong & Himmel, 2009; Rao, 2004; Shigaki, Anderson, Howald, Henson, & Gregg, 2012) and the perceptions of SWDs about postsecondary education in general (Reed & Curtis, 2012). Although some research has examined strategies to, for example, improve faculty awareness of the disability laws that broadly impact postsecondary

education (Dy, 2005) or examine the types of accommodations that can best support SWDs in the face-to-face classroom (Wolanin & Steele, 2004), there is a limited body of research examining proactive strategies (e.g., UDL) that would improve access to the educational curriculum (face-to-face and/or online) for SWDs.

Many disability services professionals have touted UDL as a viable strategy for improving access to instructional resources for SWDs. UDL was developed in the early 1990s by the Center for Applied Special Technology [CAST] (CAST, 2009). UDL is a set of guidelines for encouraging a flexible, equitable learning curriculum that meet the needs of a diverse body of learners. In recent years, there has been a fair amount of research dedicated to the integration of UDL in the K-12 educational environment (Dymond, Renzaglia, & Chun, 2008; Kortering, McClannon, & Braziel, 2008; Liu & Anderson, 2008; Narkon & Wells, 2013). Unfortunately, postsecondary education institutions have been slow to adopt UDL. The perceived benefits attached to implementing UDL principles and techniques in the postsecondary education classroom (face-to-face, hybrid, and/or online) to support SWDs, particularly those with learning disabilities and other cognitive impairments (e.g., ADD/ADHD, psychological), are clearly documented (Burgstahler, 2011; Gradel & Edson, 2009; McGuire & Scott, 2006; McGuire, Scott, & Shaw, 2003). Additionally, the research supports that UDL interventions are positively perceived by faculty teaching online courses (Catalano, 2014; Grabinger, Aplin, & Ponnappa-Brenner, 2008; Habib et al., 2012; Rao & Tanners, 2011; Seok et al., 2010), those teaching face-to-face and/or hybrid courses (Davies et al., 2013; Kumar & Wideman, 2014; Nielsen, 2013), as well as students enrolled in face-to-face,

hybrid, and online courses (Baker, Cimini, & Cleveland, 2011; Habib et al., 2012; Rao & Tanners, 2011; Schelly et al., 2011; Seok et al., 2010; Simoncelli & Hinson, 2008; Vajoczki et al., 2014; Yang, Tzuo, & Komara, 2011). Nonetheless, there is very little evidence of its impact on student outcomes (i.e., grades) in general (Wilson et al., 2011). Given the widespread adoption of newer and more innovative information and e-learning technologies in the higher education classroom (Kim, 2011), as well as the expanding role of online learning (Allen & Seaman, 2013), it is critical that newer strategies like UDL are considered to minimize the risk of these student populations being left behind.

### **Background of the Problem**

**Growing role of online learning in postsecondary education.** Allen and Seaman (2013) stated that the number of higher education institutions reporting that online learning was critical to their long-term strategy increased from less than 50% in 2002 to more than 70% in 2013. The percentage of undergraduates who took any distance education courses rose from 16 percent in 2003–04 to 20 percent in 2007–08 (Snyder & Dillow, 2012). Unlike most face-2-face classrooms, the technology platform (e.g., LMS) in an online environment plays an integral role in the ability of the student to successfully participate in the course. For SWDs who require accessible technologies like captions, screen-reading applications, and/or voice-recognition applications, the technology platform used in the course can be the difference between the student being able to participate in the course and not being able to participate at all. Research shows that inaccessible e-learning technology can adversely impact the ability of a student with a disability to access course content (Bühler, Fisseler, & others, 2007; Fichten, Asuncion,

Barile, Ferraro, & Wolforth, 2009). In recent years, there has been a growing number of legal challenges against higher education institutions for implementing inaccessible e-learning technologies (Zou, 2011; Szpaller, 2012). Despite that fact, higher education faculty members, while holding favorable attitudes towards providing accommodations (Cook, Rumrill, & Tankersley, 2009; Hong & Himmel, 2009; Rao, 2004), remain resistant to adopting proactive strategies like universal design, which would improve the overall accessibility of their courses to SWDs (Lombardi & Murray, 2011; Lombardi et al., 2011a).

**Impact of disability legislation on educational technology in higher education.** Recent legislation suggests that postsecondary institutions will continue to witness significant increases in the number of SWDs attending 2- and/or 4- year colleges and universities. These changes will greatly expand the role of postsecondary education institutions as it relates to providing supports and accommodations for SWDs.

**ADA amendments.** In January 2009, the ADA was broadened to reflect greater variation in the definition of disability. The primary purpose of these amendments was “to make it easier for people with disabilities to obtain protection under the ADA” (U.S. Government Publishing Office, n.d.). The changes to the statute and regulations for Titles I, II, and III clarify (a) who has a disability entitled to protection under the ADA and Section 504 [of the Rehabilitation Act of 1973], (b) who is entitled to accommodations, and (c) how those determinations are made and by whom.

**CVAA.** Students with sensory impairments (i.e., vision and/or hearing) are also experiencing greater protections under the law. The Twenty-First Century

Communications and Video Accessibility Act (2010) was passed by Congress in 2010 to update our nation's telecommunications protections for people with disabilities. This law ensures that individuals with sensory impairments are not left behind, providing a pathway to access the latest advances in mobile and web-based technologies. It outlines requirements for the inclusion of captioning and video description for online programming. While it does not go so far as to require that all video posted online have captioning and/or video description, it does require material broadcast on television with captioning and/or video description to have the same level of accessibility when posted online. This is especially important in postsecondary education as more and more classrooms rely on video and other types of digital media to reach students. This also fits with the growing emphasis on distance education and online learning technologies, again, ensuring that students with vision and/or hearing impairments are not left behind.

*Upcoming changes to Section 508 and Section 255.* Two additional legislative updates that will impact educational technology in postsecondary education, and thus equivalent access for individuals with disabilities are the upcoming updates to Section 508 of the Rehabilitation Act of 1973 and Section 255 of the Communications Act of 1934. The current standards are based on older technologies, which predate the widespread adoption of the Internet. As such, higher education institutions more broadly interpret what they are and are not subject to as it relates to electronic and information technology (EIT) accessibility compliance. Consequently, this has resulted in an uneven postsecondary educational experience for many SWDs when transitioning from one institution to the next (e.g., 2-year to 4-year, undergrad to grad, etc.).

Section 508 requires federal agencies to make their EIT accessible to people with disabilities (U.S. Access Board, 2000). Although Section 508 only applies to federal agencies, many states have adopted the language thus requiring higher education institutions in those states that receive federal government funds be subject to the same standards. The major revisions in this refresh, as it relates to Section 508 (U.S. Access Board, 2015), are as follows:

- Incorporate the Level AA (2.0) success criteria of the Web Content Accessibility Guidelines (WCAG) and apply associated success criteria to websites as well as to offline electronic documents and software;
- Further detail the required compatibility of covered technologies, including operating systems, software development toolkits, and software applications with assistive technology.
- Although WCAG 2.0 is not a law, they provide a reasonable standard for one to strive for in terms of EIT accessibility compliance (“WCAG 2.0 Level A/AA/AAA versus Section 508,” n.d.). These updates should eliminate confusion on the part of higher education institutions and government agencies as to which standards to follow. One important part of the updates that needs to be mentioned is the fact that the new refresh will also standardize the success criteria for offline documents with websites. This will have significant implications in higher education in the years ahead, as it will lead to a more intense focus on the accessibility of the instructional materials (i.e., Word documents, PPT, etc.) that

faculty members employ in their courses, particularly those that are delivered online.

Section 255 of the Communications Act (Federal Communications Commission, 2016) requires telecommunications equipment manufacturers and service providers to make their products and services accessible to people with disabilities, if such access is readily achievable. If not achievable, then manufacturers are required to ensure that their equipment will interface with third-party adaptive technologies like TTY/TDD machines, hearing aids, videophones, etc. This law applies broadly to all telecommunications equipment and services and will significantly factor into web-based communications with the new refresh. The major revisions in this refresh, as it relates to Section 255 (U.S. Access Board, 2015), are as follows:

- Require real-time text functionality (text that is transmitted character by character as it is being typed) for products providing real-time, two-way voice communication;
- Specify the types of non-public facing electronic content covered;

Again, these updates will have significant implications for how EIT accessibility is considered when postsecondary institutions make procurement decisions and in the development of their web-based resources (e.g., websites, online programs). Essentially, these updates will provide more clarity as to the content that would require real-time and/or post-production captioning.

**Legal challenges in recent years.** In recent years, many institutions have faced litigation and/or programmatic reviews by the Department of Justice (DOJ) or the U.S.

Department of Education's Office of Civil Rights (OCR) for failing to ensure equivalent access to websites, content management systems, and other types of EIT. In almost every instance, individuals with sensory disabilities (i.e., blind, low vision, deaf, and/or hard of hearing) initiated the legal challenge. The following cases are certainly not a comprehensive list of the legal challenges impacting educational technology decisions in higher education; they do, however, highlight why the legislation is being updated to provide greater support to individuals with disabilities when it comes to accessing EIT in the classroom and in the workplace. Furthermore, these cases illustrate why it is important for higher education institutions to consider alternative strategies for ensuring that SWDs are a part of their EIT strategic planning decisions.

***Challenges to department-specific and/or institution-specific EIT applications.***

In 2009, two blind students sued Florida State University (FSU) because the math courses that they were enrolled in relied heavily on an e-learning application, eGrade, which was inaccessible to their screen-reading applications (Zou, 2011). The math department also used a type of clicker device for polling and attendance, which was also inaccessible to the students. FSU eventually settled that lawsuit by paying each student \$75,000, and agreeing to address EIT accessibility concerns in all the courses within their Math department. They also agreed to examine the accessibility of e-learning instructional materials that were currently in use and ensure accessibility with respect to the procurement of future EIT hardware and software technologies.

In 2010, Penn State University (PSU) was sued by the National Federation of the Blind (NFB) in one of the biggest lawsuits of its kind for discriminating against students

and faculty with visual impairments (Parry, 2010). Instead of focusing on a specific department, the lawsuit looked at e-learning and information technology across the entire university. It specifically called out a lack of accessibility related to the instructor's workstations used in classrooms, departmental websites, the university's LMS, email and calendar system, as well as the ATMs. The lawsuit was settled in 2011, requiring Penn State to implement a detailed accessibility plan over the course of 12-18 months. While there are no specific references to costs, the fact that the university had to replace/upgrade a significant chunk of its IT infrastructure and hire and dedicate staff resources towards the plan's implementation, all while dealing with the same budget cuts as many other higher education institutions says a great deal about the impact of this lawsuit on that university.

***Challenges highlighting inaccessible online instructional materials.*** Two recent lawsuits have focused specifically on accessing online educational content. The South Carolina Technical College System (South Carolina's largest higher education institution) was recently audited by the OCR for failure to comply with the ADA and Section 504 of the Rehabilitation Act of 1973 (U.S. Department of Education, 2013). OCR found that departmental websites, course websites, and course documents were not readily accessible to individuals with visual impairments or other print disabilities. Similarly, the University of Montana was recently sued by a blind student for failure to provide equivalent access to his online courses (Szpaller, 2012). The student estimated that 75-90% of his courses incorporated an online component that was inaccessible to

him. Furthermore, some of his courses were fully online and many of the features (i.e., documents, library databases, videos, etc.) were inaccessible to him.

Although many of the lawsuits focus heavily on students with visual impairments and/or print disabilities, individuals with hearing impairments have been equally impacted by a lack of equivalent access as well. In 2011, Daytona State College was sued by a deaf student for failure to provide, among other things, captioning for media shown in face-2-face and online courses (“Students sue college,” 2011). In early 2015, three deaf individuals (with support from the National Association of the Deaf) filed a lawsuit against Harvard University and the Massachusetts Institute of Technology (M.I.T.) for discrimination in their free online offerings (Lewin, 2015). These individuals alleged that because edX, MIT Open Courseware, MIT’s iTunesU offerings, and MIT’s YouTube channels were poorly captioned, thus these individuals were being denied access to the free, accessible education that is available through their MOOCs.

***Challenges to inaccessible, web-based video content.*** In recent years, deaf organizations have also begun to pursue litigation against private companies for not providing equivalent access. CNN was recently sued for failing to provide captioning for the video clips that they use on their websites (Egelko, 2012). While CNN contends that they are not required to caption video clips, the lawsuit has been allowed to proceed. Netflix, on the other hand, spent two years battling the lawsuit before eventually settling (Kerr, 2012). The settlement stated that Netflix would provide captions for 100% of their online content by 2014. These lawsuits have big implications in the postsecondary educational space, as many institutions look towards online learning to supplement the

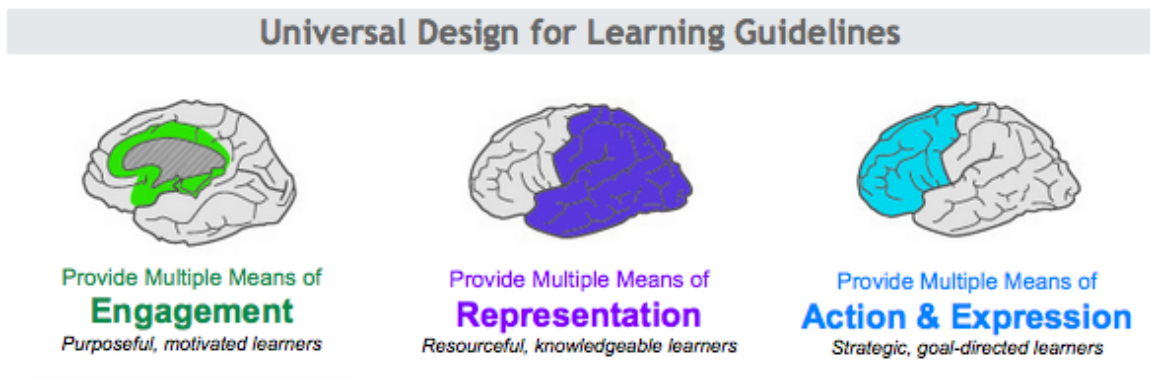
decreasing lack of state funding. So, as more and more higher education faculty incorporate video content into their curriculum, there will be greater demand from students with hearing impairments to ensure that this educational material is captioned.

### **Universal Design vs. the “Medical Model”**

Disability support services in higher education is still very much situated in the “medical model” as it relates to supporting SWDs (Burgstahler, 2012). In other words, a SWD must register with the office and provide medical documentation supporting their disability before accommodations (e.g., extended time on exams/quizzes) are authorized to support the student’s functional limitations (e.g., hearing impairment) in the classroom. The problem with current practices is that they run counter to the recent legal challenges impacting EIT accessibility in higher education. These resolutions have universally required that higher education institutions enact more proactive policies and practices to support SWDs (U.S. Department of Justice, 2013; U.S. Department of Justice, 2015; Paarry, 2010). Additionally, the literature shows that faculty members are oftentimes confused about their role in the accommodations process (Burgstahler, 2007; Izzo et al., 2008; Silver, Bourke, & Strehorn, 1998a) and that many accommodations require that faculty members retrofit or modify existing instructional materials (Aguirre & Duncan, 2013; Izzo et al., 2008; Kumar, 2010).

This is where UDL comes in. UDL originates from the term Universal Design, or UD. UD is defined as the design of products and environments to be usable by all people, to the greatest extent possible without the need for any kind of customization or adaptation (“The Center for Universal Design - About UD,” n.d.). The term originated

from the work of Ronald Mace and his colleagues at the Center for Universal Design at North Carolina State University. An easy example of UD in practice would be curb cuts or automatic doors. While certainly beneficial to users with physical impairments, like wheelchair users, they are also beneficial to individuals pushing strollers and other



*Figure 1.* Universal Design for Learning guidelines from CAST. Retrieved from <http://www.udlcenter.org/aboutudl/whatisudl>. Copyright 2012 by CAST, Inc.

individuals with issues negotiating obstacles like stairs or heavy doors.

UDL was first introduced by the Center for Applied Special Technology, or CAST, in 1998 with the goal of extending the principles of UD into the educational space. UDL consists of three core components: (1) Multiple means of representation, to give diverse learners options for acquiring information and knowledge, (2) Multiple means of action and expression, to provide learners options for demonstrating what they know and, (3) Multiple means of engagement, to tap into learner's interests, offer appropriate challenges, and increase motivation (Rose & Gravel, 2012) [See Figure 1]. UDL is built around the idea that universally designed curricula make it possible for students to have full access to course content despite physical limitations, learning disabilities, behavioral problems, or language barriers (Chodock & Dolinger, 2009). For

this reason, UDL is viewed as an attractive instructional strategy for disability services professionals in higher education and others supporting postsecondary SWDs as meeting the broad educational needs of this population.

### **Current Practices in Online Course Development at the University**

This section discusses a 4-year research institution in the Commonwealth of Virginia where this research takes place. We will highlight the units involved in the online course development process at the university as well as the course development models that are currently in place. The challenges associated with these existing models will be discussed as well.

**Offices involved in online course development.** Two units play a critical role in the development and delivery of online courses and programs at the university: the DE Office, which is situated under the Provost's Office, and the Instructional Design (ID) Team, which is under the division of Learning Support Services (LSS). LSS is a division of Information Technology Services (ITS). Some of the academic colleges and schools have faculty members and/or instructional designers playing a lead role in the development of online programs and services as well, but they focus primarily on their particular academic programs as opposed to the greater campus community. The DE Office partners with some of these programs, but still many others manage their online academic programs at the department level without support from the DE Office.

**DE Office.** The DE Office guides and implements the university's online learning presence. This is done in part by ensuring that online students have access to the same resources (e.g., registration, academic support, IT support, etc.) as students taking face-

to-face courses and by assisting academic and administrative units with developing online versions of their face-to-face courses and/or programs. The office was established in 2009 with a very small staff (i.e., an associate provost for distance education, a director of distance education, and a program manager). In the initial years of the online program, significant resources were dedicated toward obtaining SACS (Southern Association of Colleges and Schools) accreditation and building the online program through the identification of key partners (e.g., ID Team, academic units already delivering online courses and programs, etc.), the establishment of online learning processes (e.g., ID support), and reaching out to academic units and faculty to consider building online courses and programs under the DE Office's guidance.

In the past few years, the office has undergone significant changes in terms of staffing and focus. The staff has grown to include an assistant director in charge of quality assurance, an assistant director in charge of student services and communications, a communications and marketing specialist, an administrative support professional, and a part-time instructional designer. Although they still work closely with the ID Team to provide online course development support, the addition of a part-time instructional designer and funding to deliver seats for 3<sup>rd</sup> party instructional design-related professional development (e.g., Online Learning Consortium) has enabled the office to offer their own instructional design and support.

***Instructional design team.*** In the past, the DE Office played a larger role in identifying faculty members and programs in need of instructional design support for their online courses. Over the past year or so, however, the identification of these

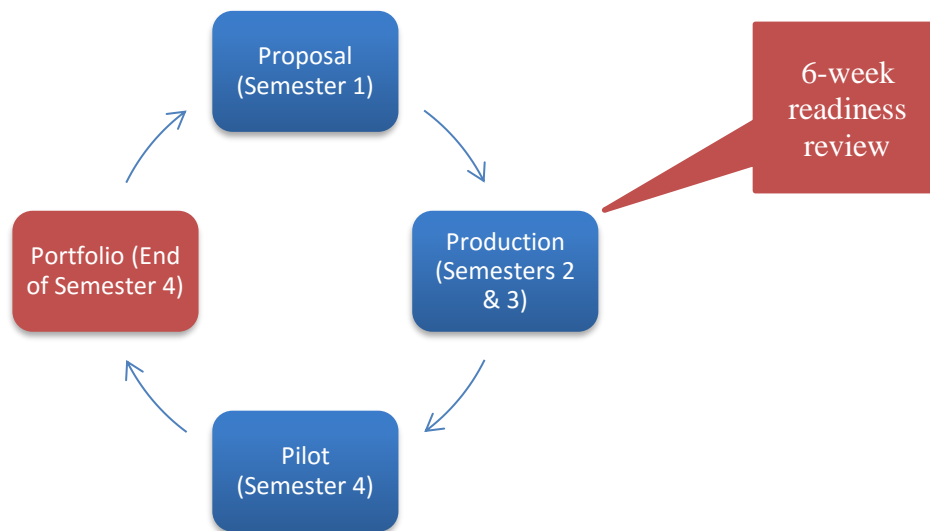
programs and courses has been driven more through direct contact with LSS. The ID Team is staffed with a manager of instructional design and 6 instructional designers. Many of the IDs have worked at the university for a several years. The manager, however, has been with the office for less than a year.

Among other things, the instructional designers assist faculty in designing effective e-Learning (“Instructional design consultations,” 2015). This includes assisting faculty with considering the medium (i.e., technology platform) in which they wish to deliver their courses and/or academic programs, training on how to effectively integrate e-Learning solutions into instruction, and identifying resources to aid with course development (e.g., Blackboard and Blackboard Collaborate). Their support extends to both face-to-face and online instruction; however, in recent years, the ID Team has played a significant role the development of online courses at the university.

***Academic units.*** Some of the university’s colleges and schools have a faculty member, several faculty members, and/or an instructional designer heavily involved in the college or school’s online academic presence. Online programs in active development with the support of the DE Office may designate a faculty member or administrator based in that program as the “DE Coordinator”. The DE Coordinator serves about 2 years in this special role (in addition to their regular academic position) and may receive compensation while the online program is being developed. Their core responsibility is to act as a liaison between the DE Office and the academic unit while also overseeing the administration of online program development.

**Existing course development models at the university.** At the present date, there are two predominant course development models in place at the university: the 4-P Process and the Online Course Development Institute (OCDI). There are still be instances of faculty members and academic units designing their own online courses without the support of DE Office or the ID Team, but it is not clear what online course development model, if any, they are following.

**4 “P”s.** The 4-P process for new DE course development was developed in 2010 by DE Office and is a year-long process of online course development consisting of four phases: (1) proposal, (2) production, (3) pilot, and (4) portfolio (D. Smucny, personal communication, September 25, 2015). Figure 3 details the process.



*Figure 2.* The Four "P"s process for new DE course development. Reprinted from (Office of Distance Education, 2012). Copyright 2012 by George Mason University.

The Provost's Office sends out a call for online proposals. Faculty members, with approval from their departments, submit proposals and, if accepted, are provided with a stipend for course development and support from an instructional designer (ID Team) throughout the yearlong process. It is a competitive process, but faculty members are provided with a great deal of support throughout all four phases of the development process. To launch new online courses, faculty members must participate in a Distance Education (DE) Faculty Orientation. During the orientation, faculty members learn more about the DE course development process, they are introduced to the relevant resources that will aid them in the course development process (i.e., library resources, technology accessibility and compliance, copyright), and they receive best practices presentations from faculty members who have previously gone through the process. At the end of the orientation, they are partnered with their instructional designer to begin the course development process.

During production phase, faculty members receive guidance and resources from their instructional designers to aid them in the online course design and delivery process. As part of the course development process, the DE Office conducts a readiness review of the course (See Appendix B), six weeks prior to the start of the pilot phase [the first semester the course will be taught online] (D. Smucny, personal communication, September 29, 2015). Faculty members receive the course readiness checklist prior to the review, and the instructional designers guide them through meeting the course and/or department-related requirements.

**OCDI.** As an alternative to the 4-P course development model, in Spring 2015, LSS piloted the OCDI. OCDI is a web-based, 6-week asynchronous program, exemplifying best practices in instructional design and theory-based research (Harris, 2015). The target audience for the OCDI is tenured, tenure-track, adjunct, and term faculty members and graduate teaching assistants currently planning to design and develop online courses that will be taught at the university (“Invitation to participate,” 2015). The program is facilitated by instructional designers from the ID Team and utilizes a cohort-based model (departmental or interdisciplinary) with 10-15 participants per cohort. The final product of OCDI is a completed course module that will serve as the template for the rest of the online course modules (includes content, activities, assessments, etc.). There is no follow-up beyond completion of the course, but faculty members are free to meet individually with instructional designers for ad hoc support (J. Dipietro, personal communication, October, 6, 2015).

**Issues impacting the online course development process.** The online course development process across the university is not entirely consistent. In other words, there is not one set standard for how courses are developed and exactly what elements (e.g., template, learning objectives, syllabus, discussion, document structure, video platform, accessibility, etc.) are required for an online course. For example, faculty members developing courses with support from the DE Office (i.e., 4-P Process) are required to undergo a thorough course readiness evaluation and receive ongoing training and guidance over the course of a year from instructional designers. Faculty members enrolled in the OCDI receive similar support from instructional designers, however,

participatory is voluntary, the training is conducted over a much shorter timeframe (i.e., 6 weeks), and the focus of the OCDI is on building out one module that would act as a template for each of the other modules developed in the course. While both are effective in preparing faculty members to develop online courses, neither follows a similar set of standards when it comes to the course development process.

Faculty members developing courses outside the purview of the DE Office or LSS are not necessarily subject to any review process. Some may have college, department, or program-specific standards that they must meet, but those standards are likely not in line with what is required from the 4-P Process or the OCDI.

***Evaluating online courses after development.*** After a 4-P Process course's first semester online, it is subject to an online course portfolio review. The online course portfolio review process evaluates courses across 6 major scoring criteria: Learning Outcomes, Course Presentation, Participation and Interaction, Learning Support, Faculty Reflection, and Course Compatibility (when an equivalent face-to-face equivalent is available). Each area contains 4-7 items and assesses the degree to which reviewers believe that a given item is demonstrated in the course portfolio (i.e., 1 – Strongly Disagree to 5 – Strongly Agree, also includes “not applicable” and “unable to judge ratings”).

One of the drawbacks to this process is that the scoring sheet is not consistently prescriptive, broadly covering some of areas mentioned above (See Appendix C). For example, one item specifically details some of the areas that should be included in the course syllabus, while another item simply asks whether course activities and learning

activities are “well designed”. The latter leaves a great deal of room for interpretation on the part of the portfolio reviewer, and the faculty member for that matter, as to whether a course sufficiently includes important design elements. This is completely counter to the 6-week readiness review, which is very prescriptive and provides an inventory of each of the important elements that should be included in the syllabus, in the course presentation and navigation section (e.g., homepage, online discussions, etc.), and in the accessibility section (e.g., All Word documents should be accessible).

The DE Office also uses the Online Learning Consortium’s (OLC) Quality Scorecard for the Administration of Online Programs (See Appendix D), which evaluates an institution’s entire online program across 9 major areas: Institutional Support, Student Support, Faculty Support, Course Structure, Course Development/Instructional Design, Teaching and Learning, Social and Student Engagement, and Evaluations and Assessment. Each area contains a set number of elements, which allow for 4 levels of assessment (i.e., Deficient-0, Developing-1, Accomplished-2, and Exemplary-3). Institutions can achieve a max score of 225 points across 75 different items. This tool is actively used by DE Office to evaluate the collective strengths and weaknesses of the university’s online program. A glaring issue with this tool, however, is that it is geared towards institutions that have fully online programs and services (e.g., University of Maryland University College). It is not necessarily geared towards institutions like this university, which operate under more of a shared services model where traditionally face-to-face services are now working to create an online presence to support the online student. Two additional drawbacks are, (1) again, the lack of a prescriptive set of

instructions for faculty as it relates to the assessing their online courses, and (2) this tool is not used to evaluate individual courses, but rather the collective strengths and weaknesses of the university's online program.

The OCDI does not follow either of the course review processes used by DE Office. Courses are reviewed to ensure that the module adheres to the design standards suggested throughout the 6-week course, but it is not clear at this time what criteria the modules are measured against. Faculty members interested in ongoing support beyond the development of the initial module may contact the LSS office to schedule one-on-one sessions, but their final, fully developed courses are not necessarily subject to any type of review.

***Incorporating accessibility into the online course development process.***

According to 4-P Process course portfolio review results from the fall 2014 (Smucny, 2015a) and spring 2015 semesters (Smucny, 2015b) , item #12 (i.e., The course employs accessible technologies or strategies – e.g., alternative text, transcripts, closed captioning) scored the lowest (i.e., 3.48 and 3.24, respectively) of the 30 items measured on the Likert scale. This indicates that faculty members are not incorporating accessible design practices (i.e., UDL) in their courses. What is not clear is why this is happening. Compare this to item #3 (i.e., Syllabus and course schedule are thorough (including major components such as outcomes, assignments, readings, grading policy, due dates, etc.)), which scored roughly a point higher (4.42 and 4.26, respectively) and one could argue is equally as nuanced in how it is described on the scoring sheet. However, course reviews are showing evidence that faculty members are more likely to include thorough course

schedules and syllabi when developing their courses than they are accessible design elements. Given that both areas are covered thoroughly within the 4-P Process model, one must question why faculty members are choosing not to include accessibility as a part of the overall course development process. No such data exists for the OCDI model at this time. The model was just piloted in spring 2015 and the office is still analyzing the feedback from cohort participants.

An additional concern is that faculty members who develop courses outside of the purview of the DE Office and LSS do not receive the same types of faculty development support on accessible design practices as those who do. The DE Office piloted an “open call” process in spring 2015 for faculty members developing courses outside of the purview of their office. The idea was to introduce those faculty members to the office and the types of services and support available to them. A review of those courses revealed similar findings to those developed by the DE Office (K. Zirkle, personal communication, May 20, 2015). In other words, faculty members generally did not include accessible design practices in their online courses.

### **Purpose of this Study**

The purpose of this dissertation is to develop and refine an online course evaluation tool that (a) integrates the principles of Universal Design for Learning (UDL) and (b) improves faculty awareness and adoption of UDL strategies. At this institution, the DE Office and the ID Team primarily support the online course development process. Some academic units within the colleges and schools also play a key role in the delivery of online courses and programs at the university. Using the Delphi Method, the tool will

undergo an iterative evaluation process until consensus from a panel of stakeholders involved in the development of online courses at the university is reached.

Long-term, it is anticipated that the implementation of the evaluation tool would improve faculty adoption of UDL strategies and improve access to the online educational curriculum for SWDs. The literature demonstrates that both faculty and students hold favorable opinions about the implementation of UDL strategies in the classroom (Catalano, 2014; Rao & Tanners, 2011; Ye, 2014; Zhong, 2012) and that students' outcomes (i.e., grades) improve when implemented in the higher education classroom (Wilson et al., 2011).

### **Research Questions**

The following research questions will guide this study:

1. What perceptions do online course developers (i.e., DE Office, ID Team, IDs and instructional faculty within colleges and schools) at the university have about incorporating UDL strategies into the online course development process?
2. What factors, as perceived by the instructional designers, impact the adoption/rejection of UDL strategies by instructional faculty teaching online courses at the university?
3. Which course elements do online course developers and students at the university perceive as most beneficial to the online teaching and learning process and how do they align with UDL principles and practices?

## Definition of Key Terms:

Accessible (‘Accessibility’)	Means a person with a disability is afforded the opportunity to acquire the same information, engage in the same interactions, and enjoy the same services as a person without a disability in an equally effective and equally integrated manner, with substantially equivalent ease of use. The person with a disability must be able to obtain the information as fully, equally and independently as a person without a disability. (“Civil rights agreement reached with South Carolina Technical College System on accessibility of websites to people with disabilities,” 2013).
Adoption	The use of an innovation on a regular basis (Rogers, 1983).
Course Elements	Course elements can be broken down into four categories: (a) course materials, (b) instructional strategies, (c) asynchronous technologies, and (d) synchronous technologies (Rao & Tanners, 2011)
Electronic and Information Technology (EIT)	Includes information technology and any equipment or interconnected system or subsystem of equipment that is used in the creation, conversion, or duplication of data or information. The term electronic and information technology includes, but is not limited to, telecommunications products (such as telephones), information kiosks, Automated Teller Machines (ATMs) and transaction machines, internet and intranet websites, electronic books and electronic book reading systems, search engines and databases, course management systems, classroom technology and multimedia, personal response systems (“clickers”), and office equipment such as classroom podiums, copiers and fax machines (OCR, Docket #03-11-2020).
Innovation	An idea, practice, or object that is perceived to be new by an individual or other unit of adoption (Rogers, 1983).
Instructional strategies	Those tactics used by the instructor to promote learning (Friedman & Fisher, 1998).

Medical Model	Practice of providing accommodations in higher education “is grounded in the medical model of disability, in which a professional identifies an individual’s functional ‘deficits’ and prescribes adjustments that allow him or her to participate to some degree in the ‘normal’ environment (i.e., classroom)” (Burgstahler, 2011).
Rejection	The discontinuance of an innovation (Rogers, 1983).
Universal Design	A concept or philosophy for designing and delivering products and services that are usable by people with the widest possible range of functional capabilities, which include products and services that are directly usable (without requiring assistive technologies) and products and services that are made usable with assistive technologies (Assistive Technology Act of 1998, U.S.C. § 3002).
Universal Design for Learning	UDL was first introduced by CAST in 1998 and consists of three core components: (1) Multiple means of representation, to give diverse learners options for acquiring information and knowledge, (2) Multiple means of action and expression, to provide learners options for demonstrating what they know and, (3) Multiple means of engagement, to tap into learner’s interests, offer appropriate challenges, and increase motivation (Rose & Gravel, 2012)

## **Chapter Two: Literature Review**

In this literature review, we will examine the factors that have contributed to why UDL is being considered as a viable strategy for improving access to higher education for SWDs. To that end, we will discuss the current research on faculty and student attitudes towards the provision of accommodations in postsecondary education; the various universal design education models; and finally, we will examine the current body of research as it relates to measuring the effectiveness of UDL implementations to support individuals with disabilities in postsecondary education.

### **Supporting Students with Disabilities in Higher Education**

**The medical model versus the proactive approach.** Burgstahler (2011) stated that the practice of providing accommodations in higher education “is grounded in the medical model of disability, in which a professional identifies an individual’s functional ‘deficits’ and prescribes adjustments that allow him or her to participate to some degree in the ‘normal’ environment” (pp. 3-4). In other words, services are generally designed to be reactive (i.e., provide a specific accommodation when the student requests services) as opposed to proactive (i.e., design instruction to meet diverse learner needs from the beginning). For example, if the student with a disability receives an accommodation for obtaining copies of lecture notes, then a faculty member in many instances may be more than willing to provide the accommodation. Thinking proactively, however, any student in the class could benefit from copies of the lecture notes. So, maybe the faculty member could incorporate that practice as a part of the course. This would enable all students to

benefit and eliminate the student with the disability from having to make a specific request.

Another consideration for moving towards more proactive approaches is the method of course delivery (e.g., face-to-face versus online). The medical model approach is much easier in a face-2-face classroom environment, where a student can ask classmates for assistance or even the faculty member themselves. It does not, however, translate as easily in an online classroom environment where the learning management system plays a vital role in the student's ability to access the course content and/or collaborate with their fellow students (i.e., discussion boards, synchronous classroom sessions).

**Faculty attitudes towards supporting students with disabilities.** Studies show that the more difficult it is for a faculty member to implement an accommodation for a student with a disability, the less likely that accommodation will be provided (Bourke, Strehorn, & Silver, 1997). Likewise, numerous studies have shown a direct correlation between faculty attitudes about supporting SWDs and the success rates of these students in postsecondary education (e.g., Baker, Bolandx, & Nowik, 2012; Dy, 2005; Hong & Himmel, 2009; Rao, 2004). In a study of faculty at Northern Virginia Community College on their knowledge of disability laws and perceptions of SWDs, Dy (2005) found that while having positive attitudes towards SWDs, faculty had very little understanding of the disability laws, how they impacted postsecondary education institutions, and their responsibilities with respect to providing accommodations. Other studies (Baker et al.,

2012; Hong & Himmel, 2009) found similar results, yet this lack of understanding did not necessarily inhibit faculty from wanting to assist SWDs. In fact, many of the faculty members in these studies were willing to go beyond what was called for to support their students. Findings from many of these studies suggest that more faculty training initiatives are needed regarding disability legislation, its impact in postsecondary education, and faculty responsibilities with respect to accommodating SWDs in the classroom. Rao (2004), however, appears to be one of the few studies that goes a step further by suggesting the need for understanding specifically what the faculty members themselves felt they needed in order to successfully support a student with a disability.

### **Additional Universal Design Education Models**

As UD became a widely accepted practice with respect to the design of architecture and the environment, educators began to look for ways to incorporate similar practices into the educational space. What came about was Universal Design for Learning (UDL), Universal Instructional Design (UID), and/or Universal Design for Instruction (UDI). They are adapted from the core principles of UD and applied specifically to learning and instruction.

Unlike the Individuals with Disabilities Education Act (IDEA), which provides structured guidelines for supporting SWDs in primary and secondary education, the Americans with Disabilities Act (ADA) and the Rehabilitation Act of 1973 provide much less guidance to higher education institutions. Similarly, for those less familiar with UDL's principles and practices, it may be difficult to interpret how best to implement it. Researchers wanted a way to apply the principles of UDL similarly in postsecondary

education, while offering more guidance to higher education faculty. Silver, Bourke, and Strehorn (1998b) initiated an approach that they termed Universal Instructional Design (UID), which essentially incorporates many of the common instructional accommodations that SWDs request from faculty members (e.g., extended time, copies of lecture notes, etc.) into the overall instructional design for the course. The idea was to eliminate the need for these students to have to request services from the disability support service office because those supports would already be built into the instruction.

McGuire, Scott, and Shaw (2003) continued this early work by developing *The Nine Principles for UDI* ©, which adapts UD specifically to promote inclusive teaching practices by faculty in postsecondary education. They use the same 7 principles in UD mentioned earlier (i.e., Flexibility in Use, Low Physical Effort, etc.), but add two additional principles: (8) A community of learners and (9) Instructional climate (see Table 1). While the initial 7 principles focus more on the flexibility and design of the instruction, these last two principles appear to get more at ensuring that the students are engaged in the classroom. The framework for these principles were developed using studies which looked at the responses from a series of focus groups involving students with learning and cognitive challenges (Madaus, Scott, & McGuire, 2003b), as well focus groups with faculty to learn about their experiences teaching in postsecondary education and best practices for supporting diverse learners in the classroom (Madaus, Scott, & McGuire, 2003a). Unlike UDL, which leaves much interpretation, their goal was to provide postsecondary education faculty with a “blueprint” of sorts with respect to

designing inclusive classroom instruction, thereby improving the likelihood that these practices could be adopted on a larger scale by postsecondary education faculty.

Table 1

*The Nine Principles of Universal Design for Instruction*

Principle	Definition
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 whenever possible, equivalent when not.
2. Flexibility in use	Instruction is designed to accommodate a wide range of individual abilities. Provide choice in methods of use.
3. Simple and intuitive	Instruction is designed in a straightforward and predictable manner, regardless of the student's experience, knowledge, language skills, or current concentration level. Eliminate unnecessary complexity
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.
5. Tolerance for error	Instruction anticipates variation in individual student learning pace and prerequisite skills.
6. Low physical effort	Instruction is designed to minimize nonessential physical effort in order to allow maximum attention to learning.
	Note: This principle does not apply when physical effort is integral to essential requirements of a course.

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|--|--|
| 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. A community of learners             | The instructional environment promotes interaction and communication among students and between students and faculty.  |
| 9. Instructional climate               | Instruction is designed to be welcoming and inclusive. High expectations are espoused for all students.  |

*Note.* Reprinted from Principles of Universal Design for Instruction by S. S. Scott, J.M. McGuire, & S.F. Shaw. Retrieved from Remedial and Special Education. Copyright 2003 by PRO-ED.

While these three education models could and have been used interchangeably, I would argue that they are meant more as a complement to one another as opposed to competition. Some studies have taken advantage of the flexibility built into UDL (Bongey et al., 2010; Kumar & Wideman, 2014; Smith, 2012), which incorporates only 3 core principles; while others have taken a much more prescriptive approach by utilizing UID or UDI (Rao & Tanners, 2011), which offer more structure. What was suggested to me, and I happen to agree with this suggestion, is that researchers should be consistent in which model they are evaluating or incorporating into their studies. That provides clarity going forward and eliminates any potential confusion. With that said, unless I reference an article which specifically addresses UID, UDI, or accessible design, I will use the term ‘UDL’ for the remainder of this dissertation paper. UDL broadly captures the principles espoused by all three models, including accessible design, while offering greater

flexibility in how an instructor meets the needs of the diverse learners within their classroom.

### **Implementing UDL in the Higher Education Classroom**

Whether it is done to support SWDs (Aguirre & Duncan, 2013; Catalano, 2014; Dotger, 2011; Habib et al., 2012; Simoncelli & Hinson, 2008), students who speak English as a second language (Ragpot, 2011), or to create a more inclusive classroom environment (Kumar, 2010; Nielsen, 2013), research shows that generally both faculty members and students have positive attitudes with respect to the implementation of UDL in the higher education classroom. In this section, I will provide an overview of the findings from these studies and attempt to identify gaps in the current research.

**Comprehensive literature review.** Over the course of my research into this topic, I reviewed over 500 articles. The articles spanned 2007-2015 and the following search terms were used: universal design for learning, UDL, universal design for instruction, UDI, universal instructional design, UID, higher education, postsecondary education, universal design, UD, distance education, online learning, and disability. The decision for this timeframe was based in large part on what the research yielded. Nonetheless, two additional determining factors were considered as well; empirical studies that were conducted within the last 8-10 years and research that was relevant to today's educational technology (e.g., LMS', Internet 2.0, online learning, etc.).

I identified approximately 30 or so empirical studies in peer-reviewed journals, which provide evidence of the positive impact of implementing UDL in the higher education classroom. While a few articles address the implementation of UDL in fully

online courses (Rao & Tanners, 2011; Ye, 2014), the overwhelming majority of the research addresses the implementation of UDL in face-to-face courses that utilize web-based educational technologies (e.g., YouTube, LMS) or hybrid courses (i.e., less than 50% of course is delivered online). Of those, only one article provided credible evidence of the impact of a UDL intervention on students' grades (Wilson et al., 2011). I will discuss that article briefly in a later section.

**Implementing UDL to support students with disabilities.** As it relates to higher education, the research in this area is limited. The studies that were identified either focused on the impact of specific UDL interventions (e.g., YouTube, virtual learning environments, etc.) on SWDs (Catalano, 2014; Habib et al., 2012) or evaluated current practices to determine the best UDL strategies to support these populations (Aguirre & Duncan, 2013; Dotger, 2011). These studies were typically conducted in face-to-face or hybrid course, small (i.e., pilot study, qualitative study) in scale, and revealed one glaring concern in the research, which is the lack of participation by student with disabilities in any large scale studies evaluating UDL implementations (Davies et al., 2013; Moon, Utschig, Todd, & Bozzorg, 2011; Rao & Tanners, 2011). For example, one study actually set out to evaluate, among other things, the impact of UDL interventions on SWDs (Davies et al., 2013). This study involved two face-to-face courses, one control group and one intervention group. Unfortunately, low numbers forced the researchers to shift the focus of the study to evaluating the impact of the UDL interventions on the overall student population as opposed to singling out those with disabilities. This was the case in many of the larger studies that were evaluated as they were often working with a course

or set of courses, which happen to have had a limited number of students with documented disabilities enrolled in them or who were willing to self-identify.

Some researchers, however, have conducted pilot studies that focus specifically on these student populations. In evaluating the impact of specific UDL interventions, Catalano (2014) conducted a mixed methods study in which seven students with diverse disabilities participated in a one-credit online library research course. The course had been adapted to be accessible using the best practices literature on library instruction, distance education for students with special needs, and UDL. After enrolling the students in a Blackboard course, the students carried out specific tasks (e.g., pre-tests, tutorials on using library databases, watch YouTube videos) and then filled out a questionnaire about their experiences. The students were also asked to participate in interviews following completion of the tasks and questionnaire. While the seven participants offered up recommendations that would address their own specific learning needs (e.g., visual impairments, hearing impairments, etc.), the researchers were able to closely link those needs with “good” instructional design. For example, among other things, students suggested that instructors provide things like timely feedback on questions and assignments, provide detailed instructions in the syllabus and in course assignments, and offer tutorials when requiring the use of new features or tools with a learning management system (i.e., discussion board). The researchers suggest that these recommendations would benefit any student, not just those with diverse disabilities. Being able to make that link could prove useful in terms of getting instructional

designers, faculty members, and other EIT professionals to buy-in when it comes to implementing UDL principles in course design.

Comparably, Habib (2012) carried out a qualitative study reviewing the experiences of twelve higher education students with dyslexia using a virtual learning environment (VLE). The students were taken through two separate interviews, once before and once after completing a set of tasks designed to mimic typical activities within a VLE. Examples of tasks included downloading documents, finding lecture presentations, and using the discussion forum. The students identified several issues ranging from inconsistent use of the VLEs on the part of faculty members, inconsistent design from one VLE to the next, inadequate preparation on the part of students with and without dyslexia, as well as a host of additional challenges. Although these researchers do not reference UDL or the need for UDL as a specific solution to address these challenges, they do suggest “a need for improvements not only in the actual physical design of VLEs, but also in the pedagogical and didactical design of courses, including offering practical support in the early phases of VLE use, ensuring that the VLE-based courses are presented in a consistent and transparent manner, and working towards as much homogeneity as possible in terms of VLE use across the same study programme” (Habib et al., 2012, p. 582). Similar to Catalano (2014), it is evident that these solutions can be linked to the need for “good” instructional design.

In contrast to those discussed previously, two ethnographic studies (Aguirre & Duncan, 2013; Dotger, 2011) were identified, which yielded valuable insight into the positives and negatives that both SWDs and the faculty members supporting them have

experienced with respect to UDL implementations in their courses. Aguirre and Duncan (2013) detailed the personal experiences of a blind student (e.g., personal excerpts) and a faculty member collaborating to determine and implement effective universal design strategies in a research course. Working collaboratively with the student, the faculty member was able to identify specific strategies with respect to alternative assessment, preparing accessible instructional materials (i.e., that could be access by a screen reader user), and communication that would later be molded into the design of future courses. It was not all successful, however, both the faculty member and the student remarked about the many failures and challenges that they had encountered. For example, the student repeatedly commented throughout the interview about the difficulty in being a strong self-advocate for accommodations that are either not provided or are provided incorrectly by the faculty member. Pushing too hard could risk alienation with the faculty member; not pushing enough risks not being provided with the tools that one would need to successfully participate in the course. Similarly, Dotger (2011) reflected on her own experiences supporting an adult student with significant disabilities in one of her courses. She reflects at great length about the many challenges that both she and the student experienced in the course, also revealing her own lack of preparation with respect to designing inclusive instructional activities and awareness about campus resources and supports for SWDs. The most significant takeaway from this particular experience was that it pushed her toward becoming a more inclusive science educator and thinking about how to plan her instruction to address these types of challenges well before a course starts.

**Measuring the impact of UDL on student outcomes.** Over the course of my research, only one article provided credible evidence of the impact of a UDL intervention on students' grades. Wilson et al. (2011) studied the effects of computer-assisted practice tests (*WEarth*) on student learning and performance in a first-year geography course. The *WEarth* application was implemented into the course to enable students to conduct self-paced formative assessments that could be accessed at any time throughout the course. This happened over the course of two separate semesters. The results demonstrated that students who used *WEarth* throughout the course had significantly higher scores on their midterm (equivalent to three letter grades) and final exams (i.e., short and long answers) than students who did not. The results also showed that students who used *WEarth* more frequently (i.e., 12 or more) did better on exams than students who used them less frequently (i.e., less than 12). These results show the positive effects that *WEarth* had on students' grades.

Another positive outcome from the study were the perceived benefits that both faculty and students derived from the use of *WEarth* application. Both the researchers and the students commented that the tool enabled students to identify their strengths and weaknesses in order to improve their performance in the course. While the researchers did not ask students specifically about UDL in the feedback surveys, it was evident that the *WEarth* application followed many of the important principles in UDL. Most notably, the flexibility to access the tool whenever students wanted and the means to self-assess their own learning (i.e., multiple means of assessment) were valuable takeaways from this study.

Davies, Schelly, and Spooner (2013) conducted a study where they compared student survey data about an intervention group of instructors who received UDL training to student survey data from a control group of instructors who did not receive UDL training. Survey data was collected both from students with and without disabilities, however, this information was not included in the reported results because the numbers were too small to generalize by disability type and against the larger population of students as a whole. The results of the study suggested UDL training had a significant effect on students' perceptions of instruction in university courses. Notably, the researchers were able to determine specific UDL strategies that students identified as having the most significant impact. For example, the use of instructional videos, providing an outline at the onset of each lecture, and presenting materials in multiple formats were identified as teaching strategies that positively impacted students' educational experiences. Although limited to students reported perceptions of a UDL intervention and lacking of any data as it relates to final grades, one could argue that this study does measure the effectiveness of UDL on student engagement.

Comparable to the Davies et al. (2013) study, a number of other researchers were able to produce similar results with respect to UDL's positive impact on student engagement. While some studies evaluated the perceptions of specific course elements (e.g., detailed syllabus, discussion forums, etc.) built into UDL-inspired undergraduate and/or graduate courses (Bongey et al., 2010; Kumar & Wideman, 2014; Rao & Tanners, 2011; Schelly et al., 2011; Seok et al., 2010), others focused on the impact of very specific tools or UDL interventions like YouTube (Jackman & Roberts, 2013), *WEarth*

(Wilson et al., 2011) , WebQuests (Yang et al., 2011), or lecture capture technology (Vajoczki et al., 2014). Findings from all of these studies collectively support that the implementation of UDL strategies or elements in higher education courses positively impacts student engagement.

**Measuring the impact of UDL training on higher education faculty.** Despite the evidence that UDL positively impacts students’ educational experiences, higher education institutions are still slow to adopt these practices. Given that, researchers have started examining the factors impacting faculty adoption of UDL principles and practices and strategies to combat that reticence on the behalf of faculty members and/or higher education institutions to implement UDL.

***Faculty perceptions about implementing UDL in the classroom.*** Faculty members generally have positive perceptions with respect to implementing UDL or inclusive teaching practices. The issue lies oftentimes in awareness and defining exactly what UDL or “inclusive” teaching strategies actually means. Lombardi, Murray, and Gerdes (2011b) evaluated faculty members perceptions about implementing UDL techniques and strategies in the classroom. Using the *Inclusive Teaching Strategies Inventory* or *ITSI* (See Appendix E), they examined both the self-reported attitudes (i.e., *I believe it is important to...*) and actions (i.e., *I do...*) of faculty members with respect to what they perceived about a particular UDL technique. For example, one of the survey items would be interpreted as “*I believe it is important to/I do...post my lecture notes online for ALL students.*” Faculty members would then indicate the extent to which they agreed or disagreed with this statement using a Likert scale. The reported findings

showed obvious discrepancies between what faculty members positively perceived about using UDL techniques and what they were actually doing with respect to implementing those strategies. In other words, faculty members were saying one thing and doing something completely different when it came to their courses.

Although this study fell short in that the overall effectiveness of these implementations on student outcomes (e.g., grades, pass/fail, course reflections, etc.) was not examined, the *ITSI* instrument proved to be an effective climate assessment tool for determining faculty practices as it relates to implementing UDL strategies in the classroom. Dallas et al. (2014) used three subscales (Multiple Means of Presentation, Inclusive Lecture Strategies, and Accommodations) within the *ITSI* to assess faculty perceptions (not actions) with respect to providing academic accommodations and using inclusive teaching strategies, as well as to determine if there were any differences between faculty groups. Findings showed that faculty members generally held positive attitudes towards providing academic accommodations. Additionally, they found statistically significant differences in their attitudes towards inclusive teaching practices on the MMP (Multiple Means of Presentation) scale for faculty who had more than 48 hours of prior disability-related training. This suggested that faculty with more disability-related experience were more likely to incorporate inclusive design practices in their planning compared to those with no experience. Although they were not able to find statistically significant differences between part-time and full-time teaching faculty, the findings were valuable in planning future training initiatives for teaching faculty with respect to more broadly incorporating inclusive training strategies in their courses.

***Barriers impacting faculty adoption of UDL.*** Moriarty (2007) carried out a multi-site, mixed methods study in which he evaluated the barriers to the adoption of inclusive teaching methods by STEM (science, technology, engineering, and math) faculty in a community college environment. Quantitative findings suggested a positive correlation between faculty adoption of inclusive teaching practices and their comfort with technology and pedagogical competencies. Additionally, faculty members indicated that a lack of time was a critical factor in their ability to adopt and learn new teaching methods/strategies. Qualitative findings largely supported the quantitative findings in that faculty members overwhelmingly indicated that high teaching loads and a lack of time to develop new teaching methods as the greatest barriers to inclusive pedagogy. Other studies also cited the amount of preparation time involved in creating accessible course materials (Kumar & Wideman, 2014) and faculty members' limited knowledge with respect to teaching with technology (Aguirre & Duncan, 2013; Nielsen, 2013; Ye, 2014) as barriers as well. An additional factor to consider is the lack of faculty awareness with respect to supporting SWDs in their courses (Aguirre & Duncan, 2013; Dotger, 2011; Habib et al., 2012; Kumar, 2010; Schelly et al., 2011). One could argue that if a faculty member were not aware that there is an issue with their current teaching practices, they would likely not consider implementing a new pedagogy. That is as much a barrier as those challenges that we initially discussed.

***Strategies for improving faculty adoption of UDL.*** Training interventions have been the most common strategy for attempting to improve faculty adoption of UDL practices. Izzo, Murray, and Novak (2008) sought to measure faculty perceptions with

respect to implementing UDL practices in the classroom to support SWDs. This two-part study lead to the development of a web-based instructional tool called *FAME*, which faculty members used as the basis for learning about UDL and strategies for implementing such practices in the classroom. The tool consisted of 5 different modules providing in-depth training on how to use UDL strategies effectively in the classroom. Pre- and post-test results suggested that the training was very well received as the percentage of faculty members who reported having a moderate to high-degree of UDL knowledge increased from 29% prior to the implementation of the training resource to approximately 94% after having participated in the training modules.

Likewise, UDL training interventions have proven effective in other studies as well (Davies et al., 2013; Moon et al., 2011; Schelly et al., 2011). Both Davies et al. (2013) and Schelly et al. (2011) used students' feedback from pre-tests taken just 2-3 weeks into the semester to provide faculty members with more focused UDL trainings (5 total) throughout the semester. As a result, post-test student responses indicated that they perceived instructors to implement more UDL principles in the classroom after having participated in trainings. In particular, two major areas of instruction were impacted; first, instructors took more care to present concepts in multiple ways and provide course materials in multiple formats. Second, instructors spent more time summarizing key concepts before, during, and immediately after instruction. Thus, incorporating student feedback early in the course to aid in the course development process resulted in positive student outcomes.

These studies, while useful for evaluating the extent to which faculty members improved their knowledge with respect to implementing UDL strategies in the classroom, do have limitations. The most glaring being that there was no evidence that faculty members had chosen to incorporate that information into their teaching strategies in the semesters that followed. Although one longitudinal study attempted to address this by providing faculty participants with financial compensation (Moon et al., 2011), concerns were expressed as to whether or not the practices would continue after completion of the study. Herman (2013) explored faculty incentives and compensation for online course delivery and development to determine the frequency and types of incentives that were well-received by faculty. It was discovered that the retention of intellectual property rights, financial compensation, and teaching/technology grants and awards were the three of the most commonly offered incentives amongst the institutions participating in the study; however, financial compensation, for example, did not always align with what faculty members wished in terms of support. This suggests that, with respect to improving the adoption of UDL or inclusive teaching practices, higher education institutions must consider the types of incentives that would not only promote adoption by faculty but also sustain it.

### **Limitations, Discussion, and Future Implications**

Based upon my findings, there is a clear need for additional research in three areas: (1) measuring the impact of UDL implementations on students' grades, (2) evaluating the impact of UDL implementations on the educational outcomes of SWDs, and (3) examining strategies for improving the adoption of UDL by higher education

faculty. As mentioned previously, my research uncovered only one study that accurately ties the implementation of a UDL strategy to students' grades in higher education (Wilson et al., 2011). Given that longitudinal studies would be required to more adequately control the other factors that could potentially influence students' grades, it may be difficult to achieve in short-term studies. Nonetheless, Wilson et al.'s (2011) study focused specifically on use of the *WEarth* application by students in the class to compare midterm and final grades. In evaluating studies that have been able to successfully identify additional UDL strategies that are positively perceived and used by students in a higher education course (Davies et al., 2013; Rao & Tanners, 2011; Zhong, 2012), it would be feasible to apply this same strategy to measure their impact on students' grades.

When it comes to evaluating the impact of UDL implementations on SWDs, the data is limited to faculty and student self-reflections (Aguirre & Duncan, 2013; Dotger, 2011) or pilot studies evaluating the needs of one specific population of students within the larger population of SWDs (Catalano, 2014; Habib et al., 2012). To date, these small, qualitative studies (i.e., autoethnography) have yielded the most valuable information with respect to how best to support individuals with disabilities in higher education. I was unable to identify any large-scale, longitudinal studies that supported these findings. Oftentimes, the number of individuals with disabilities who self-reported were so low that the data was often not reported in the study. What is evident from the research is that faculty members do not work with students with significant accommodation needs (i.e., visual, hearing, and/or significant physical, cognitive, or speech limitations) on a

consistent basis. Consequently, they may not know how to adequately prepare instruction to support these populations. It is imperative that faculty members learn specifically what teaching strategies provide the greatest benefit to students with low incidence disabilities, so that they can naturally start to incorporate those UDL practices and techniques into their instruction.

Additionally, another key finding and possibly an area for additional inquiry was the impact that supporting a student with a disability, particularly one with a significant disability, has on a faculty member. Oftentimes, neither the student with a disability nor the faculty members are completely aware of how best to address issues with equivalent access in a course (Aguirre & Duncan, 2013). Working out these challenges in real time can both place the student at a significant disadvantage to their peers in the course and create anxiety and stress on behalf of all parties. Furthermore, communication, or the lack thereof, was a key factor in determining whether or not the students successfully participated in their courses (Aguirre & Duncan, 2013; Dotger, 2011). Numerous studies have shown a direct correlation between faculty attitudes about supporting SWDs and the success rates of these students in postsecondary education (e.g., Baker, Bolandx, & Nowik, 2012; Dy, 2005; Hong & Himmel, 2009; Rao, 2004). In other words, the more knowledgeable faculty members are about disability laws, accommodations, and how best to support a student with a disability in their course, the more likely it is for that student to be successful in their course. These findings favor the argument that implementing UDL strategies when the course is developed or practicing “good”

instructional design would eliminate many of the instructional challenges that these students and faculty encounter.

Based upon the research, it is possible to measure the effectiveness of UDL training on the perceptions that faculty have about their knowledge of UDL and also to accurately identify its impact on students' perceptions of classroom instruction (Davies et al., 2013; Izzo et al., 2008; Schelly et al., 2011; Seok et al., 2010). Nonetheless, there are gaps in the current body of research. To date, few studies have examined the factors impacting why faculty members do not adopt UDL techniques and strategies in their courses. Moriarty's (2007) study is the only one that adequately addresses this topic. More research is required in this area; knowing the obstacles that prevent faculty from implementing UDL strategies (e.g., lack of incentives, lack of time for preparation of instructional materials) would aid in finding solutions that improve the adoption of UDL in postsecondary education.

For my research, I have decided to use the Delphi technique as a way to improve faculty adoption of UDL strategies in the online course development process. Long term, my desire is that improving faculty adoption of these strategies would improve access to the online classroom for all students, particularly those with disabilities.

### **The Delphi Technique**

Linstone and Turoff (2011) describe Delphi as a technique for “*applying expert input in a systematic manner using a series of questionnaires with controlled opinion feedback*” (p. 1). It was developed by Olaf Helmer, Norman Dalkey, Ted Gordon, and associates at the RAND Corporation in the 1950s with the goal of eliciting and refining

group judgments (Dalkey, 1969). Wissema (1982) argued dominant voices, or those who have built up a certain authority on a particular issue, are generally listened to more in face-to-face discussions or committees, minimizing potential important information that may come from other participants. This can lead to an inaccurate assessment of a collective group's opinion. The aim of methods like Delphi is to achieve consensus agreement around a particular issue, while overcoming some of the challenges (e.g., dominant members) found with group or committee decision making (Jones & Hunter, 1995).

The technique consists of three features: (1) *Anonymous response*, where the opinions of the panel members are obtained through a formal questionnaire; (2) *Iteration and controlled feedback*, where responses from a questionnaire are collated, summarized, and then fed back to the group in the next round of questions; and (3) *Statistical group response*, where the group opinion is defined as an appropriate aggregate of individual opinions on the final round (Dalkey, 1969). Linstone and Turoff (2011) argued that another key benefit of this technique is the ability of panelists to participate in group communication remotely and asynchronously.

**Typical Delphi process.** Theoretically, the Delphi process is set up to run continuously until consensus is achieved. However, many researchers suggest that no more than three iterations are necessary to collect the needed information and reach consensus (Delbecq, Van de Ven, & Gustafson, 1975/1986; Hsu & Sandford, 2007a; Linstone & Turoff, 2011). Linstone and Turoff (2011) explain further suggesting that the number of rounds should be based upon when stability in responses is attained, not when

consensus is achieved. Hsu and Sandford (2007a) describe a typical four-round Delphi process as follows:

1. *Round 1* – Traditionally begins with an open-ended questionnaire, which serves as the basis for development of the Round 2 questionnaire. A common modification is to use a structured questionnaire based on a review of the literature or any other appropriate information available at the time of development.
2. *Round 2* – Panelists receive the 2<sup>nd</sup> questionnaire and rate or rank-order items to establish preliminary priorities among items. As a result of this round, areas of agreement and disagreement are identified. This round is the beginning of consensus building.
3. *Round 3* – Panelists receive 3<sup>rd</sup> questionnaire that includes the items and ratings summarized from previous round and are asked to revise his/her judgments. This round gives panelists the opportunity to make clarifications.
4. *Round 4* – This is often the final round, but research suggests that the number of rounds can vary from 3-5 (Delbecq et al., 1975/1986). The list of remaining items, their ratings, minority opinions, and items achieving consensus are distributed to the panelists. This is a final opportunity for panelists to revise their opinions.

**Selecting participants.** Hsu and Sandford (2007a) argue that choosing the appropriate participants for a Delphi study is the most important step in the entire process

because it goes right to the quality of the results. Delbecq, Van de Ven, and Gustafson (1975/1986) supported this assertion, stated that participant selection is a “critical prerequisite for a successful Delphi” (p. 86). The consensus from the literature is that while there are no universally designed criteria for selecting participants, researchers do appear to universally defined the criteria used (Guptill, 2011; Kizawa et al., 2012; Neuber, 2013). What is critical is that a participant is highly skilled and has relevant expertise as it relates to the issue being evaluated.

Turoff (1970) suggests employing at least three different groups and describes their roles in the process:

1. *Decision maker(s)* – The individual(s) who will utilize the outcomes of the study;
2. *Professional staff group* – Group that designs the initial questionnaire, processes feedback, and redesign subsequent questionnaires; and
3. *The panelists* – The panel of experts responding to the questionnaires.

Delbecq, Van de Ven, and Gustafson (1975/1986) explain further that “...the [study] will be an effective process only if those decision makers who will ultimately act upon the results of the study are actively involved in the process” (p. 85).

**Sample size.** As it relates to sample size, there is no ideal panel sized identified in the literature. A review of the literature suggests that many researchers, particularly those seeking to find consensus, seek panel sizes as small as 10 and as high as the low 30s (Cairns, Yap, Reavley, & Jorm, 2015; Guptill, 2011; Kizawa et al., 2012; Neuber, 2013). Hsu and Sandford (2007a) stated that if the sample size is too small, then participants may not be a representative sample. Additionally, if the sample size is too large, low

response rates and issues with timeliness between rounds could be an issue. Delbecq, Van de Ven, and Gustafson (1975/1986) suggest that ten to fifteen participants could be sufficient when using a homogenous group. They stated that few new ideas are generated when homogenous groups get larger than 30 or so. However, if variable reference groups are used, the numbers could be significantly higher. Turoff (1970) argued that a Policy Delphi can employ anywhere from ten to fifty people. He suggested that since Policy Delphi studies are not geared towards finding consensus but rather to expose the complex differing opinions and viewpoints around several potential policy decisions, it is necessary to have larger numbers. In this study, I will seek sample sizes of 20-30 experts. This will guard against any attrition between rounds, ensuring that a representative sample participates, and still ensure that the data analysis is manageable between rounds.

**Types of Delphi methods.** Delphi was developed in the 1950s in the context of defense research (i.e., U.S. Air Force). Since that time, Delphi has been broadly applied in thousands of studies across a number of different disciplines. Delbecq, Van de Ven, and Gustafson (1975/1986) stated that while there is agreement with respect to the purpose of Delphi studies, there are significant differences in terms of the design format and how a study is conducted. The variations listed are as follows:

1. Whether or not the respondent group is anonymous;
2. Use of open-ended or structured questions to obtain information from the respondent group;
3. The number of rounds and feedback reports utilized; and
4. The decision rules used to aggregate the judgments of the respondent group.

Zolingen and Klaassen (2003) suggested that there are 4 major types of Delphi methods being used – *Classical*, *Policy*, *Decision-Making*, and *Group/Expert Workshop*. We will focus on the first three, as there were a limited number of examples that could be identified for Group Delphi applications. They are as follows:

- *Classical Delphi* – This method involves the collection of questionnaire data from panelists in an unspecified number of rounds. The results of the preceding rounds are synthesized and fed back to the panelists until stability in the responses on a specific issue is achieved. Dalkey (1969) discussed this in his study, characterizing this method as having anonymous responses, iteration and controlled feedback, and statistical group responses. It is also suggested that participants are part of a homogenous group with specific expertise in the area being investigated.
- *Policy Delphi* – This method is similar to the classical method in how the rounds are structured; however, the aim of a policy Delphi study is to not so much to achieve consensus, but rather to identify all of the different positions with respect to a given issue, as well as the pros and cons of each position (Turoff, 1970). Zolingen and Klaassen (2003) suggest that this method employ a heterogeneous response group in order to ensure as many divergent viewpoints as possible. This method is considered most suitable for social and political issues where the goal is policy generation.
- *Decision-Making Delphi* – Rauch (1979) developed this method based on the premise that essential decisions on future developments in a problem area are

borne out of the ad hoc decisions of a few. In terms of structure, this method is similar to those discussed previously. The differences, however, like in that decision makers actually participate in the Delphi rounds and that the experts are quasi-anonymous. In other words, everybody knows who is participating in the study, but all responses remain anonymous.

### **Delphi Process Used for This Study**

In this study, I used a modified version of the decision-making Delphi method. Given the predominant role of the DE Office in the online course development process at the university, it was important to ensure that decision makers from both this office and the ID Team were a part of the Delphi process. The modifications to the classical Delphi method included a focus group to develop a draft instrument for the first questionnaire and a final meeting with core stakeholders from the DE Office and the ID Team to finalize the working model.

## **Chapter Three: Methods**

### **Research Design**

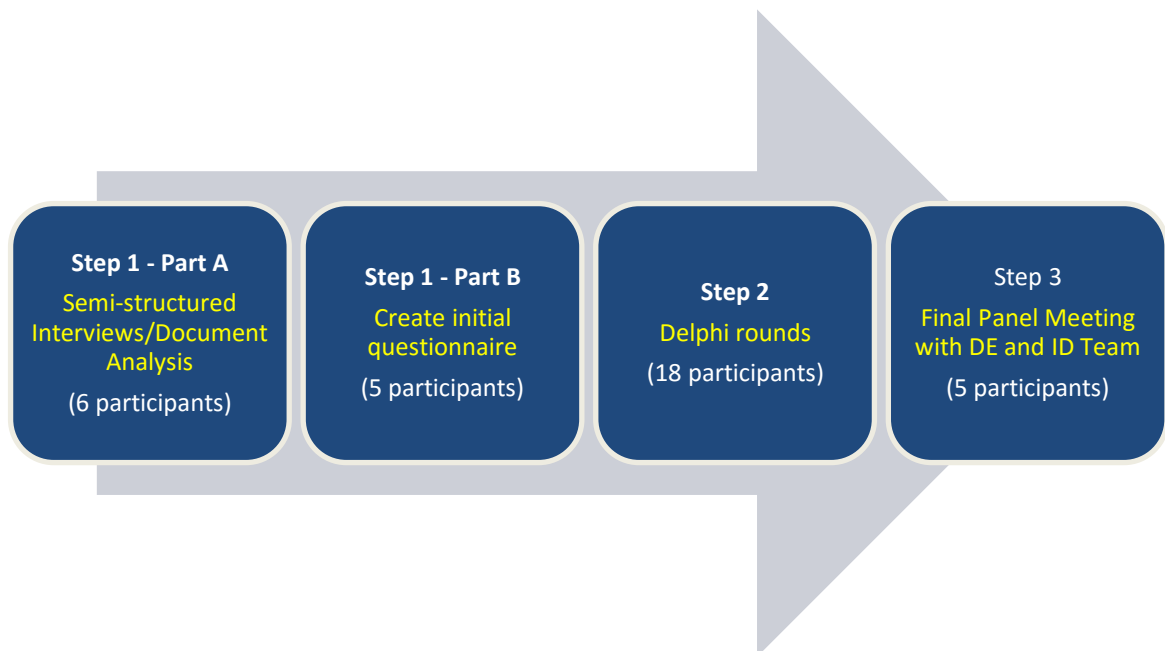
A modified decision-making Delphi method was used to establish expert consensus on the course elements that should be incorporated into the online course development process at the university. In general, Delphi procedures have three features: anonymity, controlled feedback, and statistical group response (Dalkey, 1969). The aim of methods like Delphi is to achieve consensus agreement around a particular issue, while overcoming some of the challenges (e.g., dominant members) found with group or committee decision making (Jones & Hunter, 1995). Given the predominant role of the DE Office in the online course development process at the university, it was important to ensure that decision makers from both this office and the ID Team were a part of the Delphi process. The modifications to the classical Delphi method included a focus group to develop a draft instrument for the initial questionnaire and a final meeting with these same core stakeholders from the DE Office and the ID Team to finalize the course elements that should be included in the development of an online course.

In terms of structure, I adopted a three-step method, similar to Kizawa et al.'s (2012) three-step method for drafting a consensus syllabus for palliative medicine in Japan, to develop the initial questionnaire. Step 1 was broken into two parts:

- (A) Six, semi-structured interviews by instructional designers and DE staff regarding their perspectives on the integration of UDL strategies into the online course development process.

(B) Creation of the initial questionnaire by a group of the various stakeholders involved in the online course development process.

Step 2 involved Delphi rounds to achieve consensus from a panel of online learning experts across the university; and in Step 3, the Step 1 – Part B panel was reconvened to finalize the course elements identified during this process (Figure 2).



*Figure 3.* 3-step method for developing consensus on course elements that should be included in the online course development process.

### **Recruitment of Participants**

A recruitment panel was employed to aid in the recruitment of experts for each of the steps. The panel consisted of a member of my dissertation committee (research study

oversight), two members of the DE Office (selection of participants), and one member of the ID Team (selection of participants). The recruitment panel was as follows:

- *Dissertation Committee Chair* – My dissertation committee chair provided oversight and guidance as it relates to the research study.
- *Director of Distance Education* – The Director of the DE Office is tasked with overseeing the strategic plan for the university’s online programs and services. His function on this panel was to aid in the selection of experts to participate in all of the steps of the Delphi study.
- *Assistant Director of Distance Education* – The Assistant Director for Quality in Online Instruction for the DE Office plays a critical role in online course portfolio review process and has in-depth knowledge of current online course development practices throughout the university. Her function on this review panel was to aid in the selection of experts to participate in all of the steps of the Delphi study.
- *Manager of the Instructional Design Team* – The Manager of the ID Team also plays a critical role in the online course development process, overseeing instructional design practices at the university. Her function on this review panel was to aid in the selection of experts to participate in all of the steps of the Delphi study.

## **Participants**

This section discusses how participants were identified for each phase of this study. So as to protect the anonymity of the participants in Steps 1 and 3, little to no demographic information is provided. There are a small number of potential participants

from these stakeholder units and any demographic information could easily result in revealing a participant's identity.

**Step 1A – semi-structured interviews.** Using network selection, six instructional designers and/or DE staff members were selected to participate in semi-structured interviews. The interviews focused on the participant's perspectives on the integration of UDL strategies into the online course development process. Network selection is a strategy in which each successive participant or group is named by the preceding group or individual (LeCompte, Preissie, & Tesch, 1993). The initial participants were identified by this researcher and members of the recruitment panel. Each interviewee was asked to suggest 2-3 additional colleagues who they felt would participate in the study. Participants were never made aware of how they were identified (other than their involvement in the online course development process). Furthermore, no information was provided to the original participants about any subsequent participants that agreed to be interviewed.

**Step 1B – initial questionnaire.** Five faculty/staff members were selected to aid in the development of the initial questionnaire. The participants were chosen from the following groups:

***DE office.*** Only the instructional designer for this team was included as a Step 1 participant. This individual has direct knowledge of the instructional requirements for all online courses supported through the DE Office and was able to contribute significantly to the process. Both the director and the assistant director aided in identifying potential candidates to participate in Step 2 (Delphi rounds) of the study.

**ID team.** Two senior instructional designers from this team were included as Step 1 participants. The ID Team manager aided in identifying potential candidates to participate in Step 2 (Delphi rounds) of the study.

**Academic units.** An instructional designer and a faculty member working with online programs in the College of Health and Human Services and the College of Humanities and Social Sciences, respectively, rounded out the Step 1 group. Both participants play a critical role in the development of online courses at the university and their online programs are actively supported by the DE Office. In addition to their day-to-day responsibilities, they act as liaisons between the DE Office and their respective academic units.

**Step 2 – Delphi rounds.** In this step, participants were identified using criterion-based selection. This involves establishing a set of criteria in advance of the study and identifying exemplars who fit the criteria that the researcher has established (LeCompte et al., 1993). This was done to ensure that panelists have had an adequate level of experience with online courses at the university. Delbecq, Van de Ven, and Gustafson (1975/1986) stated that participant selection is a “critical prerequisite for a successful Delphi” (p. 86). Given the wide-ranging application of Delphi methods in research, there are no universally accepted criteria for how participants are selected. It is essential, however, that multidisciplinary panels represent the variety of areas broadly impacted by the problem being investigated. The selection criteria for the Delphi round participants were as follows:

1. Individual must be a student, staff, or faculty member at the university.

2. Actively involved in the online course development process at the university for at least the past two years. (Applies to instructional faculty, instructional designers, and disability/IT accessibility professionals)
3. Have taught at least one online course in each of the past two academic years. (Instructional faculty only)
4. Enrolled in a graduate program in the university's College of Education and Human Development, College of Science, or College of Engineering and have taken at least one online course between Spring 2015 and Spring 2016. (Students only)

Forty-one potential participants were identified for inclusion in this study: 3 IDs, 2 disability services professionals, 32 instructional faculty members, and 4 graduate students. In addition to that, graduate students enrolled in the Accounting, Bioinformatics, Computational Biology, Biodefense, and Assistive Technology master's programs were asked to participate in the study by way of an email sent out by department staff. No accurate accounting of how many students were solicited by those departments was provided. Of all the potential participants, 3 declined and all others offered no response; resulting in a sample size of 19 participants. They were selected from the following groups:

- Instructional faculty teaching online courses (13)
- Instructional designers assisting in the development of online courses (2)
- Disability and information technology (IT) accessibility professionals supporting students with disabilities in online courses (1), and

- Graduate students enrolled in an online Assistive Technology Master's Program (3)

18 out of 19 participants responded (95%) in Rounds One and Two. One faculty member never responded to the solicitations for the Round One and Two questionnaires; as a consequence, this individual was not invited to participate in Rounds Three and Four. All of the remaining respondents (18 out of 18) completed the Round Three and Four questionnaires.

**Step 3.** The Step 3 panelists were the same individuals that participated in Step 1B.

### **Data Sources**

**Step 1 – document analysis and semi-structured interviews.** Qualitative data-gathering methods typically fall into three categories: observations, analysis of documents, and interviews (Banning, 1997). Two of these three methods were chosen for this phase of the study. A series of semi-structured interviews were conducted along with a review of relevant source documents (i.e., DE Course Portfolio ratings sheets, OLC Scorecard feedback) from the DE Office.

***Document analysis.*** In addition to semi-structured interviews, document analysis was performed on the findings from the DE Course Portfolio ratings sheets (Fall 2014 and Spring 2015) and the OLC Scorecard feedback (See Appendices C and D, respectively). These resources were covered at length in the introduction and informed the development of the interview protocol used in the six semi-structured interviews (See Appendix F). Bowen (Bowen, 2009) states that document analysis involves skimming

(superficial examination), reading (thorough examination), and interpretation, combining elements of both content analysis and thematic analysis. Content analysis is a method for classifying written or oral materials into identified categories (Hsieh & Shannon, 2005), while thematic analysis emphasizes recurring patterns or themes within the data (Braun & Clarke, 2006). Given the limited amount of data related to existing accessible design practices in the online course development process, no rubrics were used. The documents were skimmed to assess the current state of accessible design practices as it relates to the existing online course development models. These were used primarily to guide the development of the initial interview questions and triangulate the results of the semi-structured interviews. For example, one of the questions on the interview protocol (Appendix F) assesses the participant's opinion about why the low scores related to accessibility on the DE Course Portfolio Rating sheets from Fall 2014 and Spring 2015 exist. Follow up questions ask for participants to provide specific reasons and then ruminate on potential incentives to promote adoption of such practices by faculty members.

***Semi-structured interviews.*** Fontana and Frey (1998) define *structured interviewing* as a “situation in which an interviewer asks each respondent a series of pre-established questions with limited set of response categories”. While useful for data collection and analysis purposes, I wanted the interviews to be more flexible and interactive. I chose to use semi-structured interviews, developing interview protocols that included open-ended questions about each participant's background, role at the university, role in the online course development process at the university, role in the

integration of accessibility in online courses, perspectives on accessibility integration, as well as perspectives on faculty experiences addressing the integration of accessible design practices in their online courses. The goal of this interview protocol was to gain a broad overview of the online course development process at the university, the participant's experience and role in that process, and the participant's role and experience integrating accessible design practices into this process. Appendix F elaborates on the specific questions that were asked.

**Step 2 – online questionnaires (Delphi rounds).** The initial questionnaire (See Appendix M) was created based upon feedback from the semi-structured interviews, the document reviews, and the focus group sessions. It included both open-ended questions and Likert scale items. The Likert scale items were derived from the 6-week Readiness Checklist (Appendix J), which is currently used to assess the status of an online course 6-weeks prior to its launch. Responses were measured using a four-point Likert scale: 0 (*Unnecessary*), 1 (*Not so important*), 2 (*Desirable*), and 3 (*Essential*). The open-ended questions to elicited feedback and explanation on course elements that were rated 0 or 1 (i.e., *Unnecessary* and *Not so important*, respectively). The questionnaires utilize the same categories as those provided in the checklist (i.e., Syllabus, Course Presentation and Navigation, Design of Instructional Materials). See Appendices M through P for additional details on the questionnaires.

***Drafting the initial questionnaire.*** As reported in Hsu and Sandford (2007b), the initial round of a Delphi study traditionally involves the provision of an open-ended questionnaire to the expert panel soliciting information about the topic of the study. The

responses are then synthesized into a follow-up questionnaire, which is the survey instrument for the next round and each of the subsequent rounds. Given the predominant roles of the DE Office and ID Team in online course development at the university, it was critical that the existing DE course development processes remain intact. A great deal of infrastructure already exists in terms of how faculty members are guided through the online course development process and how the DE Office and the ID Team evaluate its efficacy. For that reason, the role of this focus group was to integrate UDL strategies into this existing process, not to completely redesign it.

In considering the initial questionnaire, the focus group concentrated on the three key success strategies identified in Step 1A: (1) Provide a consistent approach toward the integration of UDL strategies, (2) employ more prescriptive UDL strategies, and (3) focus more on inclusive design throughout online course development process, not adding accessibility (See Chapter 4 for additional details). In an effort to ensure consistency with the DE Office's existing course development models, the group examined the 6-week Course Readiness Checklist, the DE Course Portfolio Rating Sheet, and the Course Accessibility Checklist. These assessment tools examine the readiness of an online course 6-weeks prior to its first run (pilot), its efficacy shortly thereafter, and the accessibility of the instructional content to students with disabilities, respectively.

*6-week course readiness checklist.* Of the three tools that were examined, the 6-week Readiness Checklist (See Appendix B) was the only pre-assessment tool that was integrated into the online course development process. In stark contrast to the DE Course Portfolio Rating Sheet (see below), the 6-week Readiness Checklist is very prescriptive

and already includes a few UDL strategies (e.g., *Course includes a warm welcome message to students -- audio, video, or text-based*). The checklist evaluates courses on 46 individual criteria, categorizing the design elements that should be included in the syllabus, in the course layout (e.g., LMS course site, navigation, online discussions, etc.), and in the design of the instructional materials (e.g., Word/PPT/PDF docs, videos, etc.). The latter section addresses issues related to making instructional materials accessible.

There was mutual agreement amongst the focus group participants that this tool would be a good starting point for designing the initial questionnaire. The major benefit to using this assessment tool is that the IDs are already supporting it. As such, one could infer that the close working relationship they have with faculty members ensures that any updates to the tool would be smoothly integrated into the online course development process. An additional benefit is the level of detail included in this tool. This provides faculty members with clear expectations regarding most of the elements that should be included in an online course.

One drawback that we found, however, was the lack of specificity when it comes to the inclusion of UDL strategies. For example, under the Accessibility section, two of the items specify that *All Word documents are accessible* and *Accessible PowerPoint slides are available for each lecture/presentation with videos*. While these two items clearly fall under the UDL Guideline for Providing Multiple Means of Representation (CAST, 2011), they lack clear guidance for faculty members on how to ensure that Word and PPT documents are accessible. Likewise, this was evident with the other three items in this section.

*DE course portfolio rating sheet.* Of the two post-assessment tools that were evaluated, the focus group felt that the DE Course Portfolio Rating Sheet (See Appendix C) was the least prescriptive. Collectively, it was believed that the evaluation criteria were vague in many areas and incongruously prescriptive in others. While some items could be easily evaluated based on the description provided (e.g., Item #6 – *Grading criteria for assignments are explained and/or rubrics are provided*; Item #13 – Information has been provided on how to obtain accommodation guidance for students with special needs), others left room for interpretation (e.g., Item #11 – *Course contains high quality multimedia resources*; Item #12 – Course employs accessible technologies or strategies -- e.g., alternative text, transcripts, closed captioning). Take item #12, for example, grouping all UDL strategies into one evaluation criteria could prove confusing for faculty members and/or course portfolio reviewers when it comes to determining which design elements should be included in an online course and how they would be evaluated for the inclusion of such elements. There are many courses that do not use audio and/or video content, but could still include other types of UDL strategies (e.g., files provided in multiple formats). Comparing this to item #13 on the Fall 2014 and Spring 2015 DE Course Portfolio Reviews (3.24 vs. 4.28 and 3.48 vs. 4.51, respectively), one could argue that providing faculty members with clearer expectations can lead to greater adoption of certain design practices in an online course. This was also supported in the ID interviews where one of the underlying themes was the need to be upfront with faculty members about online course design expectations around the integration of UDL strategies.

Ultimately, it was decided that the 6-week Readiness Assessment covers much of what is evaluated by this tool and in greater depth. For that reason, this tool was used as a reference document.

*Course accessibility checklist.* As a result of the 6-week Readiness Checklist lacking clarity with respect to the inclusion of some UDL strategies, the focus group also reviewed the Course Accessibility Checklist (See Appendix K). This post-assessment tool is used to assess the accessibility of the instructional materials in a course after its initial pilot. Similar to the 6-week Readiness Checklist, it is very thorough, covering 64 individual criteria to evaluate the accessibility of the instructional materials used in an online course. There was a collective belief amongst the focus group participants that some of the criteria used in the course accessibility review could be used to build out some the checklist items in the *Accessibility* section on the 6-week Readiness Checklist. For example, ensuring that all Word documents include header tags to structure long documents and alternative text descriptions for important images are a few things that go into making a Word document accessible. Similar additions were identified for PPT and PDF documents, as well as for multimedia like audio and video files.

In the next section, I will highlight the changes that were made to the original checklist. These adaptations, along with many of the original checklist items, made up the initial questionnaire used in the first Delphi round.

*Finalizing the initial questionnaire.* After the initial focus group meeting, a working draft of the initial questionnaire was created. Since one of the main goals of this questionnaire was to increase transparency with respect to the inclusion of UDL

strategies for faculty, the 6-week Readiness Checklist was used as the baseline for the Round One questionnaire. As mentioned previously, this instrument is the only pre-assessment tool used in the early phases of the online course development process and it contains a series of prescriptive checklist items that faculty members must include in their online course.

The 6-week Readiness Checklist contains 46 items broken up into three separate categories of readiness assessment (Syllabus, Course Presentation and Navigation, and Accessibility). The Syllabus section has 23 checklist items, the Course Presentation and Navigation section has 18 checklist items, and the Accessibility Section has 5 items. Using a combination of the Course Accessibility Checklist and Lombardi et al.'s (2011b) ITSI, additional checklist items were added to both strengthen the accessibility section of the questionnaire and further integrate UDL strategies, where appropriate, in the other sections of the draft. This process lasted approximately three weeks with communication between myself and the focus group participants handled via email and phone. These original checklist items and the additions/adaptations are listed in the Appendix J (*6-Week Readiness Checklist Before and After UDL Adaptations*). When completed, the initial questionnaire contained 69 total course elements (28 items in the Syllabus section, 23 items in the Course Presentation and Navigation section, and 18 items in the Accessibility Section). For reporting purposes, the elements are listed by item number in Appendix L. In all, 38 UDL strategies were either added or adapted to create the initial questionnaire. Additionally, the Accessibility section was renamed the *Design of Instructional Materials* section as it was suggested both during the focus group and in the

semi-structured interviews that using UDL or Accessibility terminology would be turn off some faculty members.

***Aligning course elements with UDL.*** An additional step was taken to enlist the support of an independent accessibility/UDL researcher (from CAST) to aid in identifying how each of the course elements that were adapted and/or added to the initial online questionnaire aligns with UDL guidelines. Although this was a repeat of some of the focus group's efforts, this was done to reduce validity threats. Maxwell (2013) calls this strategy of collecting information from diverse individuals and settings, for the purpose of adding more credibility to the findings, triangulation.

As reviewed in Chapter 2, UDL guidelines are organized into three main principles (CAST, 2011): Principle I – Provide Multiple Means of Representation, Principle II – Provide Multiple Means of Interaction and Expression, and Principle III – Provide Multiple Means of Engagement. Principle I examines how learners perceive and comprehend information. Whether by disability, culture, or preference, learners learn and make connections to educational content in many different ways. Many of the examples outlined in the guidelines that make up this principle touch on strategies that reduce barriers due to multisensory (i.e., vision/hearing loss), culture, language, and/or vocabulary challenges.

Principle II examines how learners interact with the learning environment and express their comprehension of the educational content. Many of the examples outlined in the guidelines that make up this principle touch on strategies that reduce barriers related to not only navigating educational content (e.g., physical limitations), but also

expressing comprehension of educational content (e.g., answering questions in written format as opposed to oral).

Principle III focuses on the regulation of emotion to support cognition. For that reason, it examines how learners are engaged or motivated to learn. For example, some learners may prefer group discussion activities, while others prefer self-paced, individual projects. Many of the examples outlined in the guidelines that make up this principle touch on strategies for improving learner motivation, effort, and self-regulatory skills.

In Table 2, the UDL strategies that were added or amended for the initial questionnaire were grouped according to the UDL principle they align with. Of the 69 course elements included in the initial questionnaire, we identified 38 individual UDL strategies and separated them into three different groups (i.e., Principles I, II, and III). Eighteen UDL strategies aligned with UDL Principle I, twelve with Principle II, and eight with Principle III. These groupings aided us with identifying how these strategies, and more broadly the UDL guidelines and principles that they align with, were perceived by the expert panelists in Step 2. The strategies were categorized as follows:

Table 2

*UDL Strategies in Round One Questionnaire*

UDL Principle	Relevant Guideline	Item No.	Checklist Item
<i>I – Provide Multiple Means of</i>	G1. Provide options for perception (16)	9	Information on electronic equivalents is provided for all required textbooks, if available

*Representation*  
(18)

- 
- |    |  |
|----|--|
| 22 | Additional course readings, if applicable, offered in multiple formats (e.g., Word, PDF, MP3/audio, etc.)  |
| 35 | Syllabus made available in alternative formats (e.g., Word, PDF, posted directly within Bb, etc.)  |
| 41 | All links have descriptive text, as opposed to just URL (e.g., link text “Google Search”, not <a href="http://www.google.com">http://www.google.com</a> )  |
| 52 | All videos contain synchronized and accurate closed captions   |
| 53 | Text transcripts are available for each audio or video file  |
| 55 | All slides contain unique slide titles   |
| 56 | All slide text can be viewed in Outline View   |
| 58 | Instructor-produced tables created using the <b>Insert Table</b> function.   |
| 59 | Slides with audio include text transcript of audio in Notes section  |
| 60 | All headings have been formatted using Style elements (Heading 1, Heading 2)   |
| 62 | Simple tables used when appropriate (i.e., one row for column headers and one column for row headers, no merged cells)   |
| 63 | Avoid use of color only to convey meaning (e.g., changing the text color to red to indicate required information. Instructor should write ‘ <i>required</i> ’, use an asterisk, or something similar). |
| 64 | All PDF documents are text-based (i.e., text can be highlighted using a standard mouse cursor), not images. They are also  |
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			free of handwritten notes, underlines, comments, edits, etc.
		65	All URLs (including email addresses) link to correct web destinations
		66	All links have descriptive text, as opposed to just URL (e.g., link text “Google Search”, not <a href="http://www.google.com">http://www.google.com</a> )
	G2.: Clarify vocabulary and symbols (1)	57	All images, grouped images, complex images (i.e., charts and graphs), tables, SmartArt graphics, and non-text elements that convey information have meaningful alternative-text descriptions (e.g., immediately after the image, via captions, notes section, etc.)
	G3. Provide options for comprehension (1)	69	Equivalent alternative provided for all web-based supplemental resources used in the course (e.g., MindTap, Pearson MyLabs, McGraw Hill Connect, Prezi, etc.), if applicable
<i>II – Provide Multiple Means of Action and Expression (12)</i>	G4. Provide options for physical action (4)	36	Syllabus can be navigated easily (e.g., consistent use of headers or styles in WORD document, PDF file with bookmarks, etc.)
		54	All media controls keyboard accessible (i.e., can be accessed using the tab key on the keyboard)
		67	All URLs (including email addresses) are keyboard accessible (i.e., can be accessed by pressing Tab key on keyboard)
		68	All application (e.g., Skype) controls are keyboard accessible (i.e., can be accessed using the <i>Tab</i> key on the keyboard)?
	G5. Provide options for expression and	20	Allow flexibility in submitting assignments electronically (i.e., Bb, e-mail attachment, Dropbox, CD, etc.)

	communication (3)	29	Instructor uses Bb, Bb Collaborate, or a similar accessible learning management system to facilitate the course
		51	Offer multiple options for demonstrating knowledge (e.g., submitting multimedia project as opposed to final paper, etc.)
	G6. Provide options for executive functions (5)	30	Course has a well-designed landing page (may include course visuals, announcements, to-do list or what's due)
		31	Weekly Announcement has been set up, either on the Home Page or a separate page.
		34	Course includes link "Begin Here" or "Start Here", which Includes clear instructions for getting started
		37	Separate units for each week (or a specified time period) with specific dates
		38	Units having consistent structure (e.g., introduction to the topic, learning objectives, readings, mini-lectures, labs, assignments including how/where students will participate or submit, discussions, etc.).
<i>III – Provide Multiple Means of Engagement (8)</i>	G7. Provide options for recruiting interest (7)	13	Identify course activities that go beyond standard online course participation (e.g., field trips, clinical, etc.), if applicable
		16	Identify how assignments connect to course learning objectives
		32	Welcome email sent at least once to each student prior to start of course
		45	Instructor should model the first online discussions and have examples of exemplary posts for students. Online discussions should also have detailed guidelines and expectations.

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	47	All unused course tools are hidden (i.e., Only those applicable for the course - e.g., MyGrades, Email, Collaborate, Blog, SafeAssign, etc. – are made available to students)
	14	Weekly Course Schedule presented in a tabular format (includes units/modules with start-and-end dates, delivery mode if in hybrid course, readings, assignments, due dates, point values)
	15	Assignment Description (Due dates, requirements/expectations, criteria for grading/rubrics, points and/or percentages)
G8. Provide options for sustaining effort and persistence (1)	46	Instructor provided timely individual feedback to all participants, if applicable

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Due to the cross-disciplinary use of this tool, many of the items added to the checklist fall under Principles I and II. These principles focus heavily on extrinsic supports (i.e., how learners access educational content). This aligns nicely with relevant disability laws and guidelines (i.e., Section 508 and WCAG 2.0), which emphasize equivalent access to electronic and information technology resources in higher education. While some of the UDL strategies included in this initial questionnaire fall under Principle III, collectively, it was determined that the guidelines highlighted under this principle could encroach on an instructor's teaching style. Given that educational requirements vary greatly from one discipline to the next and from one academic college

or school to the next, we were careful to only include UDL strategies that were not discipline-specific.

**Step 3 – final selection of the course elements.** At the conclusion of the Delphi rounds, a final focus group discussion was conducted with the Step 1 participants. The goal was to assess the results of the Delphi rounds, review any discrepancies between the expert panelists and the stakeholder units, and finalize the list of course elements that should be included in the online course development process.

## Data Collection Procedures



*Figure 4.* Procedures and proposed timeline for data collection.

**Step 1A – semi-structured interviews and document analysis.** Upon receiving permission from IRB to proceed with the study, I reached out by phone to my first three

potential participants: IDs from the DE Office and the ID Team, respectively, and an assistant program manager with the DE Office. I worked with each of these individuals on past projects, so there was no need for introductions. I explained the purpose of my call and the reasons for conducting the study. The ID from the ID Team and the assistant program manager from the DE Office immediately agreed to participate in the study. The third apologetically declined because they would be out of the office for the next couple of months. I immediately followed-up with the first two participants via email with a copy of the informed consent form and a request for potential interview dates. Once the consent form was provided, several emails were exchanged to determine an agreed upon date.

The DE Office provided access to the DE Course Portfolio Reviews from Fall 2014 and Spring 2015, as well as the most recent OLC Scorecard review that the DE Office had submitted. Upon receipt, I proceeded to review the documents for accessibility-related findings with the goal of using the findings to inform the development of the initial interview protocol. I exchanged several emails with the assistant program manager for the DE Office to confirm the accessibility-related information that I had identified to ensure accuracy.

I conducted the two interviews within 4 days of one another. Both lasted approximately 60 minutes. After completing the initial interview, I outsourced the transcription to a web-based transcription company, which completed the transcripts within 72 hours. I repeated this procedure for the 2<sup>nd</sup> interview. Upon receipt of the two transcripts, I made a few brief formatting edits, summarized the responses by question

type (explained further below) and followed up via phone and/or email with participants to ensure that I had captured what they conveyed. Maxwell (2013) referred to this as *respondent validation*, or the systematic solicitation of feedback about your data and conclusions from the people that you are studying.

At the conclusion of each interview, I asked each participant to suggest another individual or set of individuals that could offer a well-rounded overview of the online course development process from the perspective of the IDs. Vogt (1999) describes this as snowball sampling and it involves each research participant providing the name(s) of subsequent research participants. This continues until an adequate sample size is identified. In this study, the process was repeated until 4 additional participants had been identified. Data analysis (see below) was conducted after transcripts from interviews 3 and 4 were created and, again, after interviews 5 and 6. Feedback from each “round” of interviews was re-integrated into the interview protocols as needed.

**Step 1B – creating the initial questionnaire.** I reached out to the DE Director and the ID Team Manager to discuss the study and anticipated time commitments. After each provided a verbal commitment to support the study, I contacted 1-2 staff members from each respective office, as well as other colleagues at the university who are involved in the online course development process. The DE Office’s part-time ID, two senior IDs from the ID Team, an ID in the College of Health and Human Services, and a DE faculty coordinator in the College of Humanities and Social Sciences all agreed to participate in the focus group. A calendar invite was sent through Microsoft Exchange (Outlook) to schedule a time for the focus group meetings. The calendar invite included the

recruitment letter and informed consent information (See Appendices G and H, respectively). When individuals attended the first focus group meeting, they were asked to bring their signed informed consent agreement. Those that misplaced it were provided with one to sign at the meeting.

One focus group meeting, lasting approximately 90 minutes, was conducted on February 1<sup>st</sup>, 2016. From that meeting, a working draft of the initial questionnaire was started. Over the course of the next 3 weeks, this draft was finalized via email and phone communication with the focus group members and converted to the first online questionnaire for the start of the Delphi Rounds.

**Step 2A – selecting experts.** A recruitment email (See Appendix I) was sent to over 60 faculty members teaching fully online courses in the College of Education and Human Development, the College of Science, and the School of Engineering. The email was also sent to graduate students enrolled in 26 fully online graduate certificate and/or degree programs in those same colleges and schools. These individuals were identified with support from the DE Office, the Assistive Technology Initiative, and the ID Team. The email discussed the purpose of the study, anticipated time commitments, and the informed consent information. To maximize the number of participants, the recruitment email was sent out twice between March 7<sup>th</sup> and March 17<sup>th</sup>.

After two rounds of recruitment emails, 16 faculty/staff members and 3 students agreed to participate in the Delphi Rounds. Each panelist received a follow-up email thanking them for agreeing to participate, providing information on anticipated timeframes for the receipt of the questionnaires and summary feedback throughout the

course of the study, and a personal ID code. This is how the panelists responses were recorded and panelists were instructed to enter this ID code each time they submitted responses to a questionnaire (See Appendices M – P).

**Step 2B – Delphi rounds.** There were 4 total rounds conducted, lasting approximately 45 days. Each round lasted approximately 1-1/2 to 2 weeks between the beginning of each round (i.e., availability of the next questionnaire) and the conclusion of each round (i.e., all panelists completed the questionnaire). Three to four reminders were sent during that time to ensure participants were aware of when each round would conclude.

The questionnaires were sent to panelists via SurveyMonkey.com. The questionnaires were sent on March 17<sup>th</sup>, April 1<sup>st</sup>, 11<sup>th</sup>, and 24<sup>th</sup>, respectively (See Appendices M – P). The first page of each questionnaire provided panelists with general instructions on how the Delphi Rounds would operate, how to complete the questionnaire, the anticipated time commitment for the questionnaire, and a field to enter their personal ID code. Completion of the questionnaire was taken as the panelist's consent to continue participating in the study.

On the initial questionnaire (See Appendix M), panelists were asked to rate the extent to which each instructional strategy listed on the questionnaire should be included in the development of an online course. Panelists were encouraged to consider their own beliefs about what is essential in the development of an online course, not what is required by their respective institution/college/dept./unit/etc. Modeling the Kizawa et al. (2012) study, responses were measured using a four-point Likert-type scale: 0

(*Unnecessary*), 1 (*Not so important*), 2 (*Desirable*), and 3 (*Essential*). The questionnaire also incorporated open-ended questions to elicit feedback and explanation on course elements that were rated 0 or 1 (i.e., *Unnecessary* and *Not so important*, respectively). At the conclusion of the first round, central tendencies (i.e., mean, median), dispersion (i.e., SD, IQR), frequencies, and level of agreement (i.e., LOA) were calculated for each course element. In addition to the quantitative data that was collected, qualitative data from the open-ended questions was synthesized and summarized for themes and categories.

In Round Two (See Appendix N), panelists reviewed the Round One ratings and comments, if any, from the course elements that did not meet the threshold for consensus. Panelists were asked to review the feedback from the initial round and reconsider their initial responses to these elements. Again, they were asked to rate each item on a 4pt. Likert Scale ranging from 0 (*Unnecessary*) to 3 (*Essential*). For any 0 (*Unnecessary*) or 1 (*Not so important*) ratings, panelists are asked to submit comments explaining their reasoning.

In Round Three (See Appendix O), all of the checklist items from the first two rounds that received a rating of 2 (*Desirable*) or 3 (*Essential*) by 75% or more of the panelists were separated into 3 categories: (1) Items to include in the syllabus of an online course, (2) Items that make up the presentation and navigation of an online course, and (3) Factors to consider in designing the instructional materials for an online course. Each panelist was asked to select the **10 most important course elements** in each respective category. Panelists were also encouraged to challenge the category

classifications if they felt that certain items needed to be reclassified. Each category was then followed up by an open-ended response question asking panelists to briefly explain the reasoning behind their selections. Consensus in this round was determined by the selection of items that more than 50% of the panelists agreed were most important in the development of an online course. At the conclusion of the final round, level of agreement (i.e., LOA) was calculated for each course element. In addition to that, qualitative data from the open-ended questions was synthesized and summarized for themes and categories.

In the final round (See Appendix P), panelists reviewed the ratings and comments, if any, from the previous round. Using the Round Three ratings and qualitative feedback, the panelists were asked to re-evaluate their initial responses. At the conclusion of the final round, level of agreement (i.e., LOA) was calculated for each course element. In addition to that, qualitative data from the open-ended questions was synthesized and summarized for themes and categories.

**Step 3 – final selection of course elements.** After completion of the Delphi rounds, a final meeting was held with Step 1 – Part B participants to review the findings from the Delphi rounds. Since the DE Office and ID Team would oversee the potential integration of this instrument in the overall online course development process, they were afforded the opportunity to review any course elements that were omitted during the consensus-building process (i.e., Delphi Rounds) and readmit those items to the final selection of course elements. At the completion of the review, I worked with an independent researcher/UDL professional from CAST to model Rao and Tanners' (2011)

process for mapping online course elements to UDL principles (See Figure 5 and Appendices Q & R). This process involved independently identifying the UDL-specific course elements from the final list (See Appendix J), categorizing them under the appropriate UDL principle (i.e., PI – *Representation*, PII – *Action and Expression*, and/or PIII – *Engagement*), and then working out any disagreements until consensus was reached.

Table 2

*Mapping Course Elements to UID and UDL Principles*

		A: Welcoming Classrooms	B: Essential Course Components	C: Clear Expectations	D: Timely, Constructive Feedback	E: Diverse Teaching Methods	F: Natural Supports	G: Demonstrate Knowledge	H: Interaction - Students / Faculty	I: Representation	II: Action and Expression	III: Engagement
	Course Elements	UID								UDL		
Course Materials	Syllabus: <ul style="list-style-type: none"> <li>Included disability statement</li> <li>Included rubrics for all assignments</li> <li>Included an overview of the weekly schedule for the whole semester</li> </ul>	•	•	•						•		
	Textbook: <ul style="list-style-type: none"> <li>Gave students the option of purchasing a text or electronic version</li> </ul>					•				•		
	Additional Readings: <ul style="list-style-type: none"> <li>Provided audio versions (MP3s) of articles for students</li> </ul>					•	•			•		•
	Web-based instructional modules: <ul style="list-style-type: none"> <li>Videos and audio on this website were closed captioned</li> </ul>					•	•			•		•

*Figure 5.* Sample of Rao and Tanner's (2011) table for Mapping Course Elements to UID and UDL Principles. Adapted from "Curb cuts in cyberspace: Universal instructional design for online courses," by K. Rao & A. Tanners, 2011, *Journal of Postsecondary Education and Disability*, pp. 215-216. Copyright 2011 by the Association of Higher Education & Disability (AHEAD).

## **Data Analysis**

**Step 1 – qualitative analysis.** The first phase of this study involved an analysis of Fall 2014 and Spring 2015 DE Course Portfolio Review findings, as well as the information provided regarding accessibility on the DE Office's OLC Scorecard feedback.

To evaluate the findings from the semi-structured interviews, a combination of constant comparative analysis (CCA) and summative content analysis was used. In CCA, data collection and data analysis go hand-in-hand. As soon as the data collection process starts, the data analysis starts as well. This is done because the analysis "is used to direct the next interview and observations" (Corbin & Strauss, 1990). No predetermined codes were used. CCA was an integral part of analyzing the transcripts and refining the interview protocol as I advanced through each set of interviews. To make sense of the overall findings, however, I employed a technique called summative content analysis (Hsieh & Shannon, 2005). This technique starts with the quantification of certain words or content with the purpose of understanding the contextual use of the words or content (Hsieh & Shannon, 2005). I added a slight modification to this technique by counting the open codes and grouping them into subcategories. My goal in adding this technique was

to focus more on identifying the predominant categories and themes for the purpose of reporting the results (See Chapter Four).

One thing not covered in the literature was the difficulty with following “the letter of the law” as it relates to CCA. I called this phenomenon, *proposed* CCA vs. *actual* CCA. In other words, there was virtually no time to schedule an interview, conduct the interview (avg. length ~60 min), transcribe the interview (interviews were outsourced to TranscriptionPuppy.com to save time), code the transcript, and adapt the next interview protocol, before the next interview was scheduled. To address this issue, interviews were conducted in two-person blocks. For example, data from the first two interviews was transcribed and coded together before proceeding to the next set of interviews. This was done again after the 3<sup>rd</sup> and 4<sup>th</sup> interviews. This adjustment to the methodology was very useful as it made each subsequent block of interviews more fruitful and targeted. By the end of the 3<sup>rd</sup> and 4<sup>th</sup> interviews, the emergence of certain themes facilitated not only follow-up questions for the 1<sup>st</sup> and 2<sup>nd</sup> interviewees, but also the direction and flow of the last two interviews.

All notes, interview transcripts, audio/video recordings, document reviews, and memos were hosted on my Dropbox account. To start, all interview transcripts and memos were converted to Microsoft Word documents, reformatted to 12-point Times New Roman font, lines were double-spaced, and line numbers were added to the entire transcript. Starting with the first interview transcript, I went through and separated responses based upon the questions asked in the semi-structured interviews. For example, for six questions, there would be 6 grouped responses. Next, I open coded each of those

responses, literally taking parts of the interviewee's direct quotes to create codes. I repeated this step with the other five interview transcripts. Next, I then merged all of the question #1 open codes into a separate Word document. I repeated this step for all of the remaining grouped open codes (i.e., question #2, #3, etc.). In open coding, events/actions/interactions are compared with others for similarities and differences (Corbin & Strauss, 1990). By pooling the codes from each interview question, I was able to directly compare the feedback from each interview and advance the data analysis process to the next phase. In this axial coding phase, categories and sub-categories were identified. Codes were moved outside of the boundaries of the initial question categorization as needed.

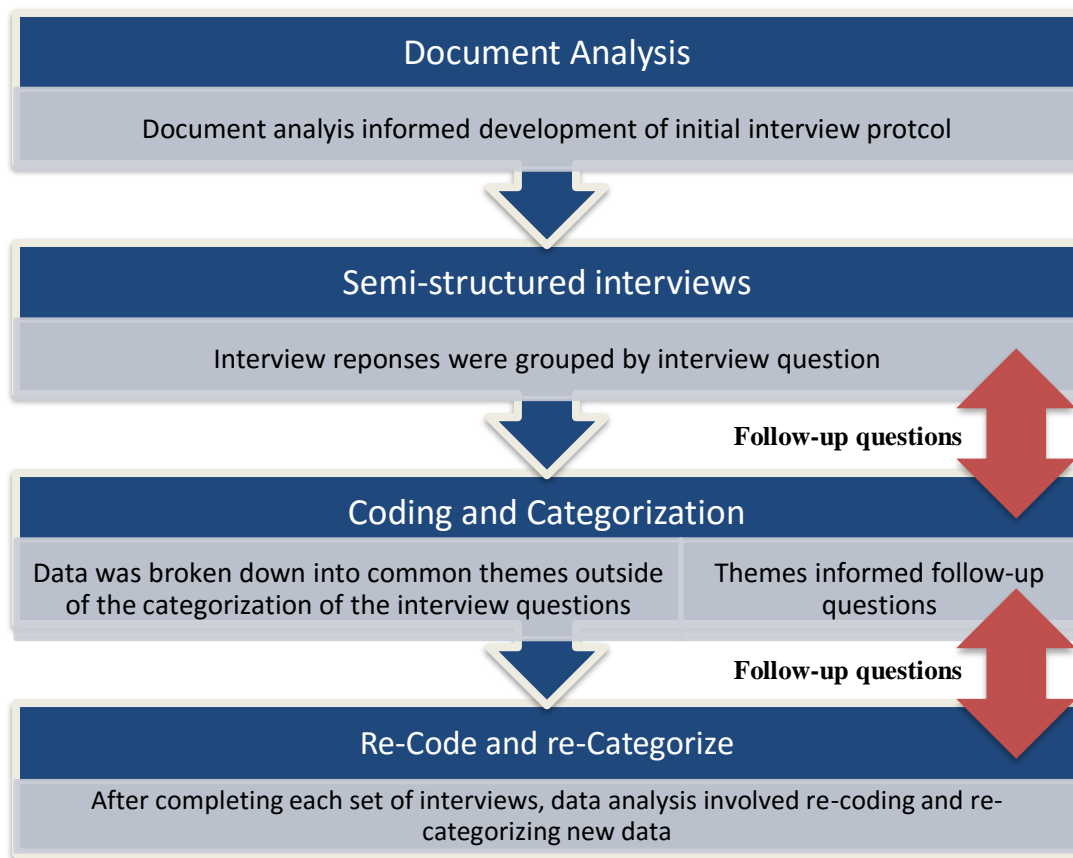


Figure 6. Overall process for developing and analyzing interview transcripts.

**Step 2 – Delphi rounds (questionnaires).** Modeling Kizawa et al.’s (2012) study, questionnaire responses from Rounds One and Two were measured using a four-point Likert-type scale: 0 (*Unnecessary*), 1 (*Not so important*), 2 (*Desirable*), and 3 (*Essential*). The questionnaire also incorporated open-ended questions to elicit feedback and explanation on course elements that were rated 0 or 1 (i.e., *Unnecessary* and *Not so important*, respectively). At the conclusion of each round, central tendencies (i.e., mean, median), dispersion (i.e., SD, IQR), frequencies, and level of agreement (i.e., LOA) were calculated for each course element. Consensus for Rounds One and Two was defined as

agreement by 75% or more of the panelists rating the course element as either *Essential/Desirable* or *Not so important/Unnecessary* and an interquartile range (IQR) of 1 or less. IQR is a measure of the dispersion from the median generated by taking the difference between the 75<sup>th</sup> and 25<sup>th</sup> percentiles (Thangaratinam et al., 2012). Gracht (2012) found that an IQR of 1 or less was a suitable indicator of consensus for 4- or 5-unit scales. In other words, the closer the IQR is to 0, the less disperse the panelists' responses are about a given course element, indicating consensus or agreement. The higher the IQR, the greater the variation in responses from the panelists, thus indicating disagreement. Items rated by more than 75% of panelists as *Not so important/Unnecessary* were automatically excluded from the Round Two questionnaire. Items from Round One that did not meet the 75% LOA and/or the IQR of 1 or less threshold, were advanced to Round Two so that they could be re-evaluated by the panel.

In Rounds Three and Four, all of the course elements from the first two rounds that met the consensus threshold were separated into 3 categories: (1) Items to include in the syllabus of an online course, (2) Items that make up the presentation and navigation of an online course, and (3) Factors to consider in designing the instructional materials for an online course. Each panelist was asked to select the 10 most important course elements in each respective category. Panelists were also encouraged to challenge the category classifications if they felt that certain items needed to be reclassified or if an entirely different category was required. Each category was then followed up by an open-ended response question asking panelists to briefly explain the reasoning behind their selections.

Consensus in these rounds was determined by the selection of items that more than 50% of the panelists agreed were most important in the development of an online course. Given that each category consisted of at least 18 different course elements and panelists were only allowed to choose 10 of those elements, LOA seemed the most appropriate choice to determine consensus. At the conclusion of Round Four, the average LOA for each course element was calculated from the LOA sum totals from the final two rounds. This average LOA measure was the indicator for overall consensus from Rounds Three and Four.

Throughout each of the Delphi Rounds, qualitative data was collected using open-ended questions. This information was used primarily to inform panelists about one another's reasoning for certain questionnaire responses.

**Step 3 – focus group/interview.** CCA was used to re-evaluate any additional qualitative data derived from the final focus group discussion/interviews.

### **Validity**

I employed three key strategies to ensure the worthiness of the data from this study: *member checking*, *triangulation*, and *interrater reliability*. *Member checking* reassures the accuracy of our participant's constructions and guards against researcher bias (Cho & Trent, 2006; Maxwell, 2013). First, I conducted a series of semi-structured interviews, using CCA to analyze and code the transcripts. I followed up with participants after receiving the transcripts from each round of interviews to ensure that what was written was in-line with what they expressed during the interviews. Maxwell (2013) also referred to this as *respondent validation*, or the systematic solicitation of

feedback about your data and conclusions from the people that you are studying. This method informed the refinement of our next interview protocol and the study's research questions, enabling us to focus more intently on themes identified from previous interviews.

*Triangulation* was also used in this study. Cho and Trent (2006) stated that *triangulation* verifies and checks specific facts collected across data sources. The semi-structured interviews supported findings from the document analysis (i.e., DE Course Portfolio ratings, OLC Scorecard data) in that accessible design practices are not consistently integrated into the online course development process at the university. This provides the baseline context for the need for this study. In addition to that, these findings are further corroborated by responses from the Delphi rounds (See Chapter Four).

The process whereby data is independently coded by multiple researchers and then compared for agreement is called *inter-rater reliability* (Armstrong, Gosling, Weinman, & Marteau, 1997). This was one of the other strategies employed to demonstrate the rigor of these findings. Armstrong argued that experienced researchers would be more likely to show agreement, while those with limited experience would magnify any differences amongst them. Given the experience of both this researcher and the independent researcher/UDL professional from CAST as it relates to the application of UDL in education, one could argue this is true. After the initial review, agreement was reached on 32 of the 38 (84%) UDL-specific course elements identified in the finalized course list (See Appendices Q & R). After discussion on the areas of disagreement, some

course elements were moved to achieve agreement on all of the UDL-specific course elements.

In addressing issues with the reliability of the study’s findings, I must also my own bias as a researcher. Maxwell (2013) defined *researcher bias* as “the selection of data that fit researcher’s existing theory, goals, or preconceptions, and the selection of data that ‘stand out’ to the researcher.” In Step 1, I attempted to address this issue by sharing the interview transcripts and subsequent themes/categories with the interviewees. In Step 2 (Delphi rounds), the expert panelists received a copy of their quantitative and qualitative responses, as well as those from each of the other expert panelists (minus any information that could reveal a participant’s identity). At no point was my own input interjected into the findings from these rounds. In my opinion, these were the most effective strategies for minimizing the influence of my own preconceived notions.

### Summary Matrix

Table 3

*Summary Matrix for Measures, Data Sources, and Proposed Data Analysis*

Research Question	Participants	Measures/ Instruments	Data	Data Analysis
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RQ1 & RQ2	Step 1 – Part A (ID/DE Interviews):  6 participants	Interview Protocol (See Appendix F), Online Course Portfolio Reviews, OLC Scorecard Materials	<i>Qualitative:</i> Interview transcripts, DE Office’s Course Portfolio Ratings scoring data, OLC Scorecard feedback	<i>Qualitative:</i> Constant Comparative Analysis/Summative Content Analysis
RQ1 & RQ2	Step 1 – Part B (Draft Panel):  5 participants	Focus Group (Focus Group Discussion)	<i>Qualitative:</i> Focus Group transcripts, DE Office’s Course Portfolio Ratings scoring data, OLC Scorecard feedback	<i>Qualitative:</i> Constant Comparative Analysis
RQ3	Step 2 (Consensus):  18 participants	Questionnaires  Delphi Round Questionnaires	<i>Qualitative:</i> Data from open-ended questions  <i>Quantitative:</i> 0-3 Likert scoring	<i>Qualitative:</i> Constant Comparative analysis  <i>Quantitative:</i> Central tendencies (i.e., mean, median), dispersion (i.e., SD, IQR), frequencies, and level of agreement (i.e., LOA)
	Step 3 (Finalization):  5 participants  (Step 1 participants)	Focus Group Protocol (Focus Group)	<i>Qualitative:</i> Focus Group transcripts	<i>Qualitative:</i> Constant Comparative analysis

*Note:* See Data Sources, Procedures, and Analysis for additional details.



## Chapter Four: Results

This chapter presents the results of the Delphi study on integrating UDL strategies into the online course development process at the university. Data were collected in three “steps” or phases; Step 1A involved semi-structured interviews and document analysis to aid in establishing the need for the integration of UDL strategies into the online course development process; Step 1B convened a focus group to develop the initial Delphi questionnaire; Step 2 consisted of a panel of 18 experts (i.e., students, staff, and faculty) participating in four Delphi Rounds to determine the course elements that are most critical in the development of an online course; and Step 3 reconvened the Step 1B focus group to review the findings from the Delphi Rounds and finalize the list of course elements that were selected. The findings are reported below by “step”.

### Step 1

**Semi-structured interviews.** Six semi-structured interviews yielded a wealth of information on the perspectives of instructional designers and online faculty/staff regarding the integration of UDL strategies into the online course development process. To that end, I used a technique called summative content analysis (Hsieh & Shannon, 2005) to assist in making sense of the findings. This technique starts with the quantification of certain words or content with the purpose of understanding the contextual use of the words or content (Hsieh & Shannon, 2005). I have added a slight modification to this technique by counting the open codes that fit under the subcategories

listed below. The goal in using this technique was to focus more on identifying the predominant categories and themes for the purpose of reporting the results.

Table 4

*Emerging Themes from Six Semi-Structured Interviews*

Categories	Subcategories (# of codes in subcategory)	Sample Quotes	Total # of Codes
ID/Faculty Partnerships	<i>IDs and Faculty have limited time, resources, and knowledge to properly address accessibility (13)</i>	ID1 – “Faculty are very, very busy, over extended and pulled in multiple directions. To ask them to build effective online courses requires a transformation of their teaching practice and it seems to ask them to also understand and implement UDL is just a bridge too far for most.”	39
		ID4 – “...I don't think that the expectation is that every course that comes out is fully accessible or fully compliant because we just don't have the manpower to do that or the resources in place.”	
	<i>There are inconsistencies in the way that each IDs approaches the integration of accessible course design practices with their faculty (11)</i>	ID2 – “Since I have beta-tested processes and everything, I know what accessibility means and exactly what is needed	

and why it is needed.  
Other IDs don't have that  
experience and therefore  
find it difficult to  
understand why you ask  
for certain things."

ID6 – "...because I've  
been having that, that  
resistance from the  
faculty I haven't been  
pushing things like make  
sure you use the header  
functions in [MS] Word.  
I can't even get faculty to  
use capitalization in  
[MS] Word. Headers?  
Forget about it."

*IDs fear overwhelming faculty  
who are new to online teaching  
(8)*

ID4 – "So we have these  
faculty members that are  
already coming in and  
trying to learn this whole  
new world of teaching  
and learning in  
vernacular in concepts  
and technologies and  
then when you  
compound that with legal  
concerns as far as  
copyright goes,  
accessibility concerns  
which also do have some  
[inaudible] occasions,  
departmental concerns,  
accreditation concerns,  
all of those types of  
things which really  
becomes very  
overwhelming."

	<p><i>IDs oftentimes use different types of communication (i.e., couch their language, present empirical data, appeal to their morality) to get faculty members to buy-in on including accessibility in their course design (7)</i></p>	<p>ID6 – “...couching it [UDL and accessibility] in student success terms. Like the reason you want to not have a two-hour long thing is because people don’t have the same attention span sitting in front of the computer, and they will actually listen to you more carefully if you can condense your material...”</p>	
Barriers to Adoption	<p><i>Factors impacting faculty adoption of accessible course design practices</i></p> <ul style="list-style-type: none"> <li>• <i>Low pay (1)</i></li> <li>• <i>Legal issues (2)</i></li> <li>• <i>Promotion and tenure (7)</i></li> <li>• <i>Ease (1)</i></li> </ul> <p><i>Lack of any academic or department mandates (17)</i></p>	<p>ID2 – “...[accessibility] is a paradigm shift for many people, but this is the new reality. Everybody is going online and this is where the laws are going, so you really don’t have a choice anymore.”</p> <p>ID3 – “In my opinion in some aspects it has to do with the promotion and tenure process. Faculty don't have to be so attentive to teaching per se, because when they are getting tenure, they're getting tenure based on their research and their grant. And teaching is like is part of the process, but it's not the most important part.”</p>	34
	<ul style="list-style-type: none"> <li>• <i>Lack of administrative enforcement when it</i></li> </ul>	<p>ID4 – “Faculty tend to follow the views of the</p>	

	<i>comes to accessibility requirements (6)</i>	administration or department.”	
		ID6 – “Most departments will follow the lead of the accrediting agencies as to what they have to include [in an online course].	
Accommodation vs. Accessibility	<i>Faculty exercise traditional approach to supporting students with disabilities -i.e., Medical Model (15)</i>	ID5 – “Many faculty members initially think, “well, I don’t have any students who need accommodations/students with disabilities in my course...why do I need to do anything?”	29
	<i>Faculty members are resistant to accessibility (6)</i>	ID4 – “I don't want to just oversimplify but the problem that we've had in fact is when we do teach about accessibility, it scares many of them away...we don’t want to make anyone feel like ‘Oh, this student has special needs. I don’t want them in the class.’”	
		ID5 – “Many faculty members just shut down when accessibility or UD-language is used.”	
	<i>Many faculty members have never been asked to address accessibility (5)</i>	ID3 – “Many faculty members have never had to consider accessibility before. They are very open to it, but it is tough for some of them. Think	

about it... When you learned how to use Microsoft Word, PowerPoint, or any of these other applications, which are now second nature to most people, they didn't have to really consider making their work accessible. But now they really have to think about it because they have to provide instruction that is accessible to all of the students.”

*IDs perspectives on accommodation vs. accessibility (3)*

ID1 – “It would be cheaper and better for all involved to only change course when a need for accessibility is registered. Easier for one or two faculty to retrofit for accommodations, vs. making the hundreds of online courses accessible each semester. Online courses change more than you think.”

Other issues impacting development of online courses

*Many faculty members and academic units are resistant to the online course development process (8)*

ID5 – “Faculty members feel like they should not have to focus on developing a course, more so on the content that is used in the course.”

12

ID6 – “There’s a shortage of qualified faculty to teach in some disciplines.”

*Many faculty members are new to online teaching and don't understand what is involved in the process (4)*

ID3 – “New online teaching faculty, ID Team staff, and DE Office staff coming to the university has resulted in greater buy-in.”

ID6 – “A lot of faculty do not start using technology or do not make the decision to start using technology until a couple of weeks before the start of class.

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Four major categories/themes emerged from the findings. This researcher will discuss each briefly.

**ID/Faculty partnerships.** The importance of the ID/Faculty relationship was very clearly defined throughout the interview process. Faculty members teaching online courses, in particular those coming to the ID Team or the DE Office for support, rely heavily on IDs to provide guidance in the way of, for example, transitioning their face-to-face courses to online courses, assistance in choosing the correct educational technology to implement in their courses, and, in the context of these interviews, identifying ways to ensure that their course content is accessible to all students. Although some institutions have their IDs fully build-out the courses and the faculty members simply add content, that is not the case at this institution. Consequently, faculty members and IDs must work together to ensure the successful development of an online course.

During the interviews, it was evident that many of the IDs are very protective of this partnership. By that, I mean it was clear that inconsistencies exist amongst all of the participants when it comes to encouraging faculty members to integrate UDL strategies into their online courses. ID1 stated that members of the ID team have “varying levels of commitment to accessible design practices.” Collectively, the IDs were concerned with overwhelming faculty members that are new to the online teaching experience. As ID1 added later, they have to “weigh their promotion against faculty situations where they barely have time to take on the basics of good online course design.”. As another ID put it, “most faculty teaching online are novices” and are oftentimes unaware of the time commitment involved with preparing to teach online. As such, the IDs themselves struggle with getting faculty members to adhere to their own set of milestones, so some consider accessibility after the fact.

ID2 also added that many faculty members “don’t know how to teach with technology.” This, unfortunately, raises the bar for the successful integration of accessible course design practices because it would suggest that faculty members would require a certain level of technical skill before they could or would take any initiative to ensure that their courses incorporate UDL or accessibility. ID6 summed it up best, signaling that due to resistance from the faculty, she: “hasn’t been pushing things like make sure you use the header functions in [MS] Word. I can't even get faculty to use capitalization in [MS] Word. Headers? Forget about it.”

**Barriers to adoption.** The barriers impacting the adoption of UDL strategies were numerous. Most of the comments centered around the external demands on faculty

(i.e., other teaching and learning responsibilities), the lack of a top-down mandate to include UDL strategies, and faculty incentives (i.e., promotion and tenure).

For example, many of the IDs mentioned that a good number of the faculty members teaching online courses are adjunct faculty. In many instances, these individuals may work other full-time jobs and do not receive the compensation (as compared to full-time instructors or teaching faculty), course-building time, and/or ID support required to successfully develop and integrate UDL or accessibility into their online courses.

Another factor mentioned was accreditation. Interestingly, this topic elicited discussion about enforcement and who could essentially “require” faculty to integrate accessible design practices in their online courses. ID4 commented that the DE Office and the ID Team have essentially no ability to enforce these practices. It was suggested that this responsibility falls to the faculty member’s department or possibly upper administration (e.g., Provost’s Office). ID6 supported this assertion, stating that “most departments will follow the lead of the accrediting agencies as to what they have to include [in an online course].”

The promotion and tenure process is an additional factor that is not often considered. ID3 remarked that “faculty don't have to be so attentive to teaching per se, because they are getting tenure based on their research and their grant. And teaching is part of the process, but it's not the most important part.” Other IDs also suggested that the promotion and tenure process does not place a great deal of emphasis on teaching. For that reason, faculty members, specifically full-time research faculty who also have

teaching responsibilities, may wonder why they should expend a great deal of resources in an area that they are not likely to be evaluated on.

**Accommodation vs. accessibility.** This theme addresses the perceptions ID's have about how faculty respond to what is traditionally done to support students with disabilities in higher education (accommodation) versus proactively developing instructional content that is accessible to most students, regardless of disability (accessibility). ID5 stated that many faculty members initially think, "Well, I don't have a student with a disability in my course...why do I need to do anything?" Likewise, ID6 commented that "faculty members will only do anything if the request comes from the top-down or from the Disability Services Office." Collectively, many of the IDs agreed that faculty are generally receptive to supporting a student with a disability if a direct request is made.

As it relates to integrating UDL or accessibility in an online course, the IDs appear to have differing opinions. One ID commented that:

It would be cheaper and better for all involved to only change a course when a need for accessibility is registered. It is easier for one or two faculty members to retrofit for accommodations, versus making the hundreds of online courses accessible each semester. Online courses change more than you think.

On the other hand, some IDs stated that faculty members are actually quite open to considering UDL or accessibility; there is, however, some reluctance because they have "never been asked to do those kinds of things." ID4 affirmed this, commenting that accessibility "scares many of them away." Additional responses suggest that some of the

reluctance may be more technical than personal. For example, a few of the IDs mentioned that some faculty members are limited when it comes to their understanding how to make MS Word or PPT documents accessible. Therefore, the idea of having to learn these techniques while dealing with the other responsibilities of online course development may be a bit overwhelming.

**Other issues impacting online course development.** Some of the issues impacting the integration of accessible design practices in online courses have more to do with a general resistance to the adoption of online learning than anything else. A few of the IDs suggested that many faculty members lean toward how they learned best. ID4 stated it best:

There's an educational disposition to teach how we were taught. We were taught face-to-face, we were taught via lecture, they sat in a chair and [expletive] they listened to that guy preach for three hours a day. So, you kids are going to sit down and you're going to listen to me, because that's how I learned and that's the way it works

An additional concern by faculty appears to be the online delivery model for course content. Several IDs mentioned that faculty members feel they “should be discipline-focused” as opposed to concerning themselves with how a course is developed. In other words, the work of creating an online course shell and/or making instructional resources accessible should not be the responsibility of the faculty member. At some institutions, this work falls to the instructional designer, instructional technologist, or, in the case of integrating accessible design practices, an accessibility professional. As that is not the

case at this university, it could be that faculty members and their respective academic departments are having to shift how they approach the learning process and how they integrate technology as well. As ID6 stated, “There’s a shortage of qualified faculty to teach [online] in some disciplines. We have people who have just been hired in August to teach a new online course and they’ve never taught online before.” Compound that with the fact that “some faculty do not start using technology or do not make the decision to start using technology until a couple of weeks before the start of class.” Given the preparation involved in developing an online course (Herman, 2013), and the fact that many faculty may not be comfortable teaching with technology (Ye, 2014), this paradigm shift in the learning process could be somewhat of a shock.

There are signs, however, that attitudes about teaching online are softening at the university. ID3 noted that faculty/staff turnover in the academic departments, the DE Office, and the ID Team has started to result in greater buy-in. In addition to that, as more academic units explore opportunities to transition some of their offerings online, there has been an increased emphasis on hiring faculty/instructors that are comfortable teaching online and teaching with technology.

***Summary – step 1A.*** Despite the challenges identified in the interviews, IDs were able to highlight strategies that may aid in improving faculty buy-in and integrating UDL strategies into the online courses at the university. These techniques have been successful in “disarming” the resistance that many faculty members have toward the inclusion of UDL strategies. They are as follows:

1. Provide a consistent approach toward the integration of UDL strategies in online courses;
2. UDL strategies employed in online courses should be more prescriptive; and,
3. Focus should be on inclusive design practices, not adding accessibility.

As described previously, the ID/Faculty partnership is a critical part of a successful online course at the university. As it relates to the integration of UDL strategies, it is imperative that all of the IDs have the same approach toward this aspect of the online course development process. Existing practices show clear differences in how IDs approach the integration of UDL strategies and, as such, this is evident not only in the reflections of those IDs being interviewed, but also in the document review findings.

Another strategy employed by the IDs to promote the integration of UDL strategies by faculty members involves streamlining the number of things to be considered and embedding those techniques throughout the online course development process. ID2 described how this was handled in the past, where faculty members would be guided through the entire design and development process, and then the last thing that was covered was how to make the course content accessible. As ID2 put it, “[faculty members] were looking at me like, you've got to be kidding! This is too much! After all that I've done, I still have to do this?” ID4 echoed the new strategy best, stating that they “try very hard to boil it down to three, four, or five core things that faculty members can do, that are super easy, that can make their course accessible to probably 90-95% of the folks out there.” This sentiment was shared by other IDs commenting that faculty

members are willing to adopt such practices if they are easy to do and made aware of inclusive design techniques during the development process as opposed to at the end.

To encourage faculty to integrate UDL strategies in their online courses, some of the IDs cajole faculty by appealing to the trusting nature of the ID/Faculty partnership, the faculty member's sense of "doing the right thing", or actually presenting empirical data from the research. Others, however, back away from using UDL or accessibility language altogether. For example, "couching one's language" was frequently mentioned during the interviews. ID5 stated that they oftentimes "avoid using terms like *accessibility* or *UDL*" because those terms tend to be off-putting to faculty members. ID6 suggested it was best to "couch [UDL and accessibility] in student success terms."

Encouraging faculty members to think '*will this actually improve student learning*' or '*could this possibly impact my evaluations if I do this as a service to the students?*' For example, choosing to use a series of short, 15-minute video clips as opposed to an entire 2-hour video or adding knowledge checks throughout a lesson as opposed to none at all are, as perceived by the IDs, more positively perceived by students. This strategy of shifting the focus to inclusive design choices as opposed to choices around disability tended to, in their collective opinions, disarm faculty members, allowing for a more fruitful and collaborative partnership.

## **Step 2**

Step 2 consisted of a four-round modified decision-making Delphi study. These rounds were structured to align with the DE Office's practice of requiring faculty to have at least 60% of their online course complete by the 6-week Readiness Review and 100%

of the course complete by the start of the semester (D. Smucny, personal communication, September 25, 2015). In Rounds One and Two, expert panelists were asked to rate the extent to which each of the course elements listed in the initial questionnaire should be included in the development of an online course. The findings from these rounds are intended to simulate 100% of all the course elements that should be included in an online course by the start of the semester.

In Rounds Three and Four, the expert panelists were asked to reexamine the findings from the two initial rounds and identify the 10 most important course elements from each of the remaining categories (e.g., *Syllabus*). During the Step 1 focus group, it was mentioned while the DL established this arbitrary benchmark of 60% complete by the 6-week Readiness Review, there are no clear indicators for which course elements should be included in that 60% benchmark. The findings from these rounds were intended to simulate the bare minimum that should be included in an online course 6-weeks prior to the start of the semester.

This section focuses specifically on the course elements that did not achieve consensus during the Delphi rounds. A detailed summary and discussion of the more positively perceived course elements, as well as how the findings align with UDL, is in Chapter Five.

**Round one.** In Round One, panelists were asked to rate the extent to which each of the course elements listed on the questionnaire should be included in the development of an online course. Responses were measured using a four-point Likert scale: 0 (*Unnecessary*), 1 (*Not so important*), 2 (*Desirable*), and 3 (*Essential*). The questionnaire

also incorporated open-ended questions to elicit feedback and explanation on course elements that were rated 0 or 1 (i.e., *Unnecessary* and *Not so important*, respectively). Consensus was defined as 75% or more of the panelists rating the course element as either *Essential/Desirable* (i.e., 2 or above) or *Not so important/Unnecessary* (i.e., 1 or below) and an interquartile range, or IQR, of less than 1. IQR is a measure of dispersion for the median and consists of the middle 50% of all responses (Gracht, 2012). An IQR of 1 or less means that 50% of all responses fall within 1 point of the median (De Vet, 2004). Manikandan (2011) argued that it is best to use the median and IQR as opposed to the mean and SD when working with skewed (or non-normal) data. Furthermore, unlike the SD, IQR is not effected by extreme measures. Studies have shown that an IQR of 1 or less is an acceptable indicator of consensus for four- or five-point Likert scales (as cited in Gracht, 2012 and Giannarou and Zervas, 2014). If more than 75% of the panelists rated the course element as *Not so important* (1) or *Unnecessary* (0), then that item was excluded from the next round of questionnaires. The questionnaire for Round One is included in Appendix M.

***Quantitative data.*** Analysis of the Likert scale ratings were used to determine consensus among a panel of experts on the course elements that are essential to the development of an online course. Data from the completed questionnaires were analyzed using SPSS to calculate central tendencies (i.e., mean, median), dispersion (i.e., SD, IQR), frequencies, and level of agreement (i.e., LOA). The results are included in Tables 5 through 7.

Table 3

*Frequency Statistics from Round One (Syllabus)*

Item #	M	Med*	SD	IQR	Essen*	Desi*	NSI*	Unnec*	LOA
1	2.89	3.00	0.47	0.00	94%	0%	6%	0%	94%
2	2.72	3.00	0.58	0.25	78%	17%	6%	0%	94%
3	2.78	3.00	0.43	0.25	78%	22%	0%	0%	100%
4	2.78	3.00	0.55	0.00	83%	11%	6%	0%	94%
5	2.00	2.00	0.84	1.25	28%	50%	17%	6%	78%
6	2.33	2.50	0.84	1.00	50%	39%	6%	6%	89%
7	2.67	3.00	0.69	0.25	78%	11%	11%	0%	89%
8	2.89	3.00	0.47	0.00	94%	0%	6%	0%	94%
9	2.17	2.00	0.79	1.00	33%	56%	6%	6%	89%
10	2.83	3.00	0.38	0.00	83%	17%	0%	0%	100%
11	2.39	2.50	0.78	1.00	50%	44%	0%	6%	94%
12	2.94	3.00	0.24	0.00	94%	6%	0%	0%	100%
13	3.00	3.00	0.00	0.00	100%	0%	0%	0%	100%
14	2.56	3.00	0.62	1.00	61%	33%	6%	0%	94%
15	2.61	3.00	0.70	1.00	72%	17%	11%	0%	89%
16	2.11	2.00	0.58	0.25	22%	67%	11%	0%	89%
17	2.78	3.00	0.43	0.25	78%	22%	0%	0%	100%
18	2.94	3.00	0.24	0.00	94%	6%	0%	0%	100%
19	3.00	3.00	0.00	0.00	100%	0%	0%	0%	100%
20	1.67	2.00	0.91	1.00	17%	44%	28%	11%	61%

21	1.83	2.00	0.79	1.25	22%	39%	39%	0%	61%
22	1.72	2.00	0.67	1.00	11%	50%	39%	0%	61%
23	2.61	3.00	0.85	0.25	78%	11%	6%	6%	89%
24	2.61	3.00	0.85	0.25	78%	11%	6%	6%	89%
25	2.06	2.00	1.06	2.00	44%	28%	17%	11%	72%
26	2.28	3.00	0.90	2.00	56%	17%	28%	0%	72%
27	2.56	3.00	0.86	1.00	72%	17%	6%	6%	89%
28	2.22	3.00	1.06	1.25	56%	22%	11%	11%	78%

*Note:* Med = Median, Essen = Essential, Desi = Desirable, NSI = Not so important, Unnec = Unnecessary.

Table 4

*Frequency Statistics from Round One (Course Presentation and Navigation)*

Item #	M	Med*	SD	IQR	Essen*	Desi*	NSI*	Unnec*	LOA
29	2.50	3.00	0.79	1.00	67%	17%	17%	0%	83%
30	2.61	3.00	0.50	1.00	61%	39%	0%	0%	100%
31	2.22	2.00	0.81	1.00	39%	50%	6%	6%	89%
32	2.28	3.00	0.96	1.25	56%	22%	17%	6%	78%
33	2.17	2.00	0.71	1.00	28%	67%	0%	6%	94%
34	2.22	2.00	0.88	1.00	44%	39%	11%	6%	83%
35	2.39	3.00	0.92	1.00	61%	22%	11%	6%	83%
36	2.56	3.00	0.71	1.00	67%	22%	11%	0%	89%
37	2.50	3.00	0.86	1.00	67%	22%	6%	6%	89%
38	2.61	3.00	0.61	1.00	67%	28%	6%	0%	94%
39	2.67	3.00	0.77	0.00	83%	0%	17%	0%	83%
40	2.56	3.00	0.86	1.00	72%	17%	6%	6%	89%
41	2.39	3.00	0.85	1.00	56%	33%	6%	6%	89%
42	2.61	3.00	0.70	1.00	72%	17%	11%	0%	89%
43	1.89	2.00	0.83	1.25	22%	50%	22%	6%	72%
44	2.00	2.00	0.97	1.25	33%	44%	11%	11%	77%
45	1.94	2.00	0.87	2.00	28%	44%	22%	6%	72%
46	2.61	3.00	0.61	1.00	67%	28%	6%	0%	94%
47	2.56	3.00	0.51	1.00	56%	44%	0%	0%	100%
48	1.83	2.00	0.92	1.25	22%	50%	17%	11%	72%

49	2.39	3.00	0.85	1.00	56%	33%	6%	6%	89%
50	1.61	2.00	1.04	1.25	22%	33%	28%	17%	56%
51	2.06	2.00	0.94	1.00	33%	50%	6%	11%	83%

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*Note:* Med = Median, Essen = Essential, Desi = Desirable, NSI = Not so important, Unnec = Unnecessary.

Table 5

*Frequency Statistics from Round One (Design of Instructional Materials)*

Item #	M	Med*	SD	IQR	Essen*	Desi*	NSI*	Unnec*	LOA
52	2.61	3.00	0.50	1.00	61%	39%	0%	0%	100%
53	2.22	2.00	0.81	1.00	39%	50%	6%	6%	89%
54	2.61	3.00	0.61	1.00	67%	28%	6%	0%	94%
55	2.11	2.00	1.02	1.25	44%	33%	11%	11%	78%
56	2.28	2.00	0.83	1.00	44%	44%	6%	6%	89%
57	2.28	2.00	0.75	1.00	39%	56%	6%	0%	94%
58	1.72	2.00	0.83	1.00	11%	61%	17%	11%	72%
59	2.33	2.50	0.84	1.00	50%	33%	6%	11%	83%
60	2.22	2.50	1.00	1.00	50%	33%	6%	11%	83%
61	2.44	3.00	0.86	1.00	61%	28%	6%	11%	89%
62	2.33	2.00	0.69	1.00	44%	44%	11%	0%	89%
63	2.33	2.00	0.77	1.00	44%	50%	0%	6%	94%
64	2.39	2.50	0.78	1.00	50%	44%	6%	0%	94%
65	2.94	3.00	0.24	0.00	94%	6%	0%	0%	100%
66	2.50	3.00	0.71	1.00	61%	28%	11%	0%	89%
67	2.50	3.00	0.86	1.00	67%	22%	6%	6%	89%
68	2.39	3.00	0.85	1.00	56%	33%	6%	6%	89%
69	2.44	3.00	0.78	1.00	56%	39%	0%	6%	94%

*Note:* Med = Median, Essen = Essential, Desi = Desirable, NSI = Not so important, Unnec = Unnecessary.

***Summary – round one.*** There were 69 course elements included in the Round One questionnaire. Based upon feedback from Round One, the panelists found consensus

on 54 of the course elements. The remaining 15 elements were below the 75% LOA threshold and/or had an IQR  $> 1$ , warranting further consideration by the panelists. These course elements were used to develop the Round Two questionnaire. No items from Round One were rated low enough by the panel to be removed.

In the Syllabus section, consensus was not achieved on items 5, 20, 21, 22, 25, 26, and 28. Items 20 (*Allow flexibility in submitting assignments electronically*), 21 (*Provide information on recommended course resources*), and 22 (*Offer additional course readings, if applicable, in multiple formats*) had the lowest consensus measures (i.e., LOA = 61%) of any items in this section. Item 21 had an IQR of 1.25, while items 20 and 22 had an IQR equal to 1. Low IQR and mean values ( $M = 1.67$  and  $1.72$ , respectively), for these items suggests that panelists are somewhat split between rating these items *Not so important* or *Desirable*. Items 25 (*Provide information on diversity, religious holidays, etc.*) and 26 (*Provide information on student privacy*) had LOA numbers just under the 75% threshold (72%), but one of the largest dispersion rates (IQR = 2) of any item in any category rated in Round One. While panelists collectively rated these items as *Desirable* ( $M = 2.06$  and  $2.28$ , respectively), there was a fair amount of disagreement amongst the panelists with respect to whether or not this rating was appropriate. Finally, while more than 75% of panelists agreed that items 5 (*Provide Blackboard login instructions*) and 28 (*Provide information on student support services*) were *Desirable* ( $M = 2.00$  and  $2.22$ , respectively) to include in the development of the course syllabus, the dispersion rates were slightly above acceptable levels (IQR = 1.25).

In the Course Navigation and Presentation section, consensus was not achieved on items 32, 43, 44, 45, 48, and 50. Item 50 (*Tests/Quizzes are developed in Blackboard with assigned points*) had the lowest consensus measure (LOA = 58%, IQR = 1.25) of any item in the Round One questionnaire. Items 43 (*Course is 100% complete prior to the start of the semester*), 45 (*Instructor should model the first online discussions and have examples of exemplary posts for students*), and 48 (*Includes links to Student Responsibilities and Services modules pages*) had LOA numbers just under the 75% threshold (72%) and IQR values that were greater than or equal to 1.25. Finally, while more than 75% of panelists agreed that items 32 (*Welcome email sent at least once to each student prior to start of the course*) and 44 (*Discussion/Blog/Journal prompts and descriptions have been created in Blackboard*) were *Desirable* ( $M = 2.28$  and  $2.00$ , respectively) to include in the development of the course syllabus, the dispersion rates were slightly above acceptable levels (IQR = 1.25).

In the Design of Instructional Materials section, consensus was not achieved on items 55 and 58. Item 58 (*Instructor-produced tables created using the Insert Table function*) had an LOA below 75% (72%) and an IQR value of 1.25. Item 55 (*All slides contain unique slide titles*) achieved 78% LOA from the panelists, but the dispersion rate was slightly above acceptable levels (IQR = 1.25).

**Round two.** In Round Two, panelists were asked to review the Likert scale ratings and open-ended comments from Round One for the 15 course elements that did not meet the threshold for consensus. Again, they were asked to rate each item on a four-point Likert scale ranging from 0 (*Unnecessary*) to 3 (*Essential*). For any 0

(*Unnecessary*) or 1 (*Not so important*) ratings, panelists were asked to submit comments explaining their reasoning. As with Round One, consensus was defined as 75% or more of the panelists rating the course element as either *Essential/Desirable* (i.e., 2 or above) or *Not so important/Unnecessary* (i.e., 1 or below) and an  $IQR \leq 1$ . The questionnaire for Round Two is included in Appendix N.

***Quantitative data.*** Analysis of the Likert scale ratings were used to determine consensus among a panel of experts on the remaining 15 course elements. Data from the completed questionnaires were analyzed using SPSS to calculate central tendencies (i.e., mean, median), dispersion (i.e., SD, IQR), frequencies, and level of agreement (i.e., LOA). The results are included in Tables 8 through 10. Table 11 compares the IQR and LOA findings for the 15 items that were evaluated in the first two rounds.

Table 6

*Frequency Statistics from Round Two (Syllabus)*

Item #	M	Med*	SD	IQR	Essen*	Desi*	NSI*	Unnec*	LOA
5	2.11	2.00	0.83	2.00	39%	33%	28%	0%	72%
20	1.17	1.00	1.10	2.00	17%	17%	33%	33%	33%
21	1.56	2.00	0.62	1.00	0%	61%	33%	6%	61%
22	1.78	2.00	0.94	1.25	22%	44%	22%	11%	67%
25	1.56	2.00	1.20	3.00	28%	28%	17%	28%	56%
26	2.11	2.50	1.08	2.00	50%	22%	17%	11%	72%
28	2.11	2.00	0.96	2.00	44%	28%	22%	6%	72%

*Note:* Med = Median, Essen = Essential, Desi = Desirable, NSI = Not so important, Unnec = Unnecessary.

Table 7

*Frequency Statistics from Round Two (Course Presentation and Navigation)*

Item #	M	Med*	SD	IQR	Essen*	Desi*	NSI*	Unnec*	LOA
32	2.50	3.00	0.86	1.00	67%	22%	6%	6%	89%
43	1.94	2.00	0.73	1.25	22%	50%	28%	0%	72%
44	2.00	2.00	0.84	1.25	28%	50%	17%	6%	78%
45	1.94	2.00	0.87	2.00	28%	44%	22%	6%	72%
48	1.72	2.00	1.08	1.50	22%	50%	6%	22%	72%
50	1.61	2.00	0.98	1.00	17%	44%	22%	17%	61%

*Note:* Med = Median, Essen = Essential, Desi = Desirable, NSI = Not so important, Unnec = Unnecessary.

Table 8

*Frequency Statistics from Round Two (Design of Instructional Materials)*

Item #	M	Med*	SD	IQR	Essen*	Desi*	NSI*	Unnec*	LOA
55	2.22	2.50	1.00	1.00	50%	33%	6%	11%	83%
58	2.11	2.00	0.96	1.00	39%	44%	6%	11%	83%

*Note:* Med = Median, Essen = Essential, Desi = Desirable, NSI = Not so important, Unnec = Unnecessary.

Table 9

*Comparing IQR and LOA for Rounds One and Two*

Item #	IQR - Rd. 1	IQR - Rd. 2	LOA - Rd. 1	LOA - Rd. 2
5	1.25	2.00	78%	72%
20	1.00	2.00	61%	33%
21	1.25	1.00	61%	61%
22	1.00	1.25	61%	67%
25	2.00	3.00	72%	56%
26	2.00	2.00	72%	72%
28	1.25	2.00	78%	72%
32	1.25	1.00	78%	89%
43	1.25	1.25	72%	72%
44	1.25	1.25	77%	78%
45	2.00	2.00	72%	72%
48	1.25	1.50	72%	72%

50	1.25	1.00	56%	61%
55	1.25	1.00	78%	83%
58	1.00	1.00	72%	83%

*Note:* Med = Median, Essen = Essential, Desi = Desirable, NSI = Not so important, Unnec = Unnecessary.

**Summary – round two.** Based upon feedback from Round Two, the panelists found consensus on 3 of the 15 course elements included on the questionnaire (i.e., items 32, 55, and 58). The remaining 12 elements were below the 75% LOA threshold and/or had an IQR > 1.00. None of the items in the Syllabus section met the threshold for consensus. Item 20 was the only course element that registered any significant change from Round One to Round Two. In this instance, the LOA actually regressed from 61% to 33% and the IQR increased from 1.00 to 2.00. In the Course Navigation and Presentation section, consensus was achieved on item 32. The LOA increased from 78% to 89% and the IQR decreased from 1.25 to 1.00. In the Design of Instructional Materials section, consensus was achieved on both items (i.e., 55, 58). In both instances, the LOA increased from 72% to 83% and the IQR decreased from 1.25 to 1.00.

Given that responses remained stable and/or regressed (LOA and/or IQR) on the remaining 12 items from Round Two, I decided not to continue with the existing questionnaire. This was done to allow time for panelists to participate in additional rounds that would identify the course elements that should be completed by the DE Office's 6-week Readiness Assessment and to accommodate faculty members on the panel who were preparing to leave for the summer break soon.

**Rounds three and four.** In Rounds Three and Four, the expert panelists reviewed the 57 course elements that met the threshold for consensus in Rounds One and Two. While the expert panelists were encouraged to make changes to the initial groupings and/or suggest changes to these groupings, no changes and/or suggestions were made. Minor changes were, however, made to how some course elements were grouped in Round Three. Some elements were switched to other categories so as to eliminate redundancy (e.g., “all URLs link to correct web destinations” was listed in both the *Course Navigation and Presentation* and *Design of Instructional Materials* sections). Others were added in both the *Syllabus* section and the *Course Navigation and Presentation* section. The latter reflected feedback from multiple panelists who suggested a preference for placing, for example, information on student responsibilities in the learning management system (i.e., *Course Navigation and Presentation* section) as opposed to the course syllabus. The final categories remained as follows: (1) Items to include in the syllabus of an online course, (2) Items that make up the presentation and navigation of an online course, and (3) Factors to consider in designing the instructional materials for an online course.

In these rounds, the expert panelists were asked to select the 10 most important course elements in each respective category. Each category was then followed up by an open-ended response question asking panelists to briefly explain the reasoning behind their selections. Consensus was defined by the selection of course elements that more than 50% of the expert panelists agreed were essential in the development of an online

course (i.e.,  $LOA - AVG > 50\%$ ). The questionnaires for Rounds Three and Four are included in the Appendix (See Appendices P and Q, respectively).

***Quantitative data.*** Analysis of the Likert scale ratings were used to determine consensus among a panel of experts on the 10 most important course elements in each respective section. Data from the completed questionnaire were analyzed using SPSS to calculate frequencies and level of agreement (i.e., LOA) for each round. An average LOA was calculated based upon the responses from each round. This calculation was used to determine the top 10 course elements for each respective category. The results are included in Tables 12 through 14.

Table 10

*Frequency Statistics from Rounds Three and Four (Syllabus)*

Item #	LOA - Rd3	LOA - Rd4	LOA - AVG
1	88.9%	88.9%	88.9%
10	77.8%	83.3%	80.6%
17	77.8%	83.3%	80.6%
8	72.2%	77.8%	75.0%
15	72.2%	72.2%	72.2%
12	61.1%	77.8%	69.5%
14	77.8%	61.1%	69.5%
7	61.1%	55.6%	58.4%
3	66.7%	44.4%	55.6%
18	55.6%	50.0%	52.8%
4	55.6%	50.0%	52.8%
24	44.4%	44.4%	44.4%
13	44.4%	38.9%	41.7%
36	38.9%	44.4%	41.7%
23	27.8%	27.8%	27.8%
2	16.7%	27.8%	22.3%
27	22.2%	22.2%	22.2%
16	11.1%	27.8%	19.5%
9	11.1%	11.1%	11.1%
6	11.1%	5.6%	8.4%
11	5.6%	5.6%	5.6%

*Note:* Med = Median, Essen = Essential, Desi = Desirable, NSI = Not so important, Unnec = Unnecessary.

Table 11

*Frequency Statistics from Rounds Three and Four (Course Navigation and Presentation)*

Checklist items	LOA - Rd3	LOA - Rd4	LOA - AVG
38	100.0%	94.4%	97.2%
37	94.4%	88.9%	91.7%
30	94.4%	83.3%	88.9%
29	88.9%	83.3%	86.1%
39	72.2%	83.3%	77.8%
32	66.7%	66.7%	66.7%
34	61.1%	66.7%	63.9%
35	61.1%	61.1%	61.1%
47	61.1%	55.6%	58.4%
31	50.0%	61.1%	55.6%
46	50.0%	50.0%	50.0%
33	50.0%	38.9%	44.5%
51	38.9%	44.4%	41.7%
27	33.3%	27.8%	30.6%
44	22.2%	33.3%	27.8%
49	33.3%	16.7%	25.0%
24	16.7%	27.8%	22.3%
23	5.6%	16.7%	11.2%

*Note:* Med = Median, Essen = Essential, Desi = Desirable, NSI = Not so important, Unnec = Unnecessary.

Table 12

*Frequency Statistics from Rounds Three and Four (Design of Instructional Materials)*

Checklist items	LOA - Rd3	LOA - Rd4	LOA – AVG
65	83.3%	77.8%	80.6%
53	72.2%	77.8%	75.0%
52	72.2%	77.8%	75.0%
67	83.3%	66.7%	75.0%
61	72.2%	77.8%	75.0%
64	77.8%	66.7%	72.3%
69	72.2%	72.2%	72.2%
54	72.2%	72.2%	72.2%
63	66.7%	66.7%	66.7%
66	55.6%	66.7%	61.2%
60	61.1%	61.1%	61.1%
68	44.4%	44.4%	44.4%
59	38.9%	38.9%	38.9%
62	38.9%	33.3%	36.1%
55	27.8%	38.9%	33.4%
56	33.3%	33.3%	33.3%
58	27.8%	27.8%	27.8%

*Note:* Med = Median, Essen = Essential, Desi = Desirable, NSI = Not so important, Unnec = Unnecessary.

***Summary – rounds three and four.*** Based upon feedback from Rounds Three and Four, 32 course elements (11 from Syllabus, 10 from Course Presentation and Navigation, and 11 from Design of Instructional Materials) met the threshold for consensus. One item was rated at exactly 50%. No items achieved 100% LOA by the panelists; there were, however, fourteen items (i.e., items 1, 8, 10, 17, 29, 30, 37, 38, 39, 52, 53, 61, 65, and 67) that achieved at least a 75% LOA by the panelists. Most notable were items 37 (Separate units for each week, or a specified time period, with specific dates) and 38 (Units have consistent structure -- e.g., introduction to the topic, learning objectives, readings, mini-lectures, labs, assignments including how/where students will participate or submit, discussions, etc.), which each scored above 90% (91.7%, and 97.2%, respectively). This means at least 16 of the 18 panelists agreed.

Five items (i.e., 6, 9, 11, 16, and 23) achieved a LOA of less than 20% (i.e., 8.4%, 11.1%, 5.6%, 19.5%, and 11.2%, respectively). All except item 23 were from the Syllabus section. Although item 23 was listed in both the Syllabus and Course Navigation and Presentation sections for Rounds Three and Four, the above reported result is based on its inclusion in the Course Navigation and Presentation section. In the Syllabus section, item 23 achieved an LOA of 27.8%.

### **Step 3**

No changes were made to any of the findings from the Delphi rounds. Due to the timing of the meeting (i.e., end of spring semester, beginning of summer session), most

of the focus group members had little time to process the results. As a consequence, the group collectively elected to leave in place the results from the Delphi rounds.

In the next two subsections, I briefly summarize the findings from each of the Delphi rounds. Discussion and the implications of these findings will be addressed in greater detail in Chapter Five.

**Final summary from rounds one and two.** There were 69 course elements evaluated in Rounds One and Two. The panelists found consensus on 57 of these course elements (See Appendix Q). The remaining 12 elements were below the 75% LOA threshold and/or had an IQR > 1, warranting that they be removed from the finalized list. As it relates to UDL, 38 UDL strategies that were amended or added to the initial questionnaire. Consensus was achieved on 35 of these original 38 UDL strategies.

No changes were made or suggested to the initial course element groupings (i.e., *Syllabus*, *Course Navigation and Presentation*, *Design of Instructional Materials*). In the *Syllabus* section, the panel achieved consensus on 21 of the original 28 course elements. In the *Course Navigation and Presentation* section, the panel achieved consensus on 18 of the original 23 course elements. In the *Design of Instructional Materials* section, consensus was achieved on all 18 of the course elements included in the original questionnaire.

**Final summary from rounds three and four.** In Rounds Three and Four, the 57 course elements (including 35 UDL strategies) from the first two rounds were examined to determine the most important course elements to include when developing an online course. Panelists were asked to choose the 10 most important from each section. Again,

no changes were made to the initial course element groupings (i.e., *Syllabus*, *Course Navigation and Presentation*, *Design of Instructional Materials*) and consensus was defined as having a more than 50% Average LOA on any course element.

Overall, the panel achieved consensus on 32 of the 57 course elements from Rounds Three and Four. Of these, 20 were UDL strategies. In the *Syllabus* section, the panel achieved consensus on 11 of the 21 course elements. In the *Course Navigation and Presentation* section, the panel achieved consensus on 10 of the 18 course elements. In the *Design of Instructional Materials* section, consensus was achieved on 11 of the 18 course elements.

## **Chapter Five: Discussion**

This chapter presents a brief overview of the study's purpose, research questions, and methodology. This will be followed by a discussion of the findings and conclusions for each research question, how these findings align with the integration of UDL strategies into the online course development process, the study's limitations, and implications for future study.

### **Overview**

The purpose of this study was to develop and refine an online course evaluation tool that (a) integrates the principles of UDL and (b) improves faculty awareness of UDL strategies. The literature demonstrates that both faculty and students hold favorable opinions about the implementation of UDL strategies in the classroom (Catalano, 2014; Rao & Tanners, 2011; Ye, 2014; Zhong, 2012) and that students' outcomes (i.e., grades) improve when implemented in the higher education classroom (Wilson et al., 2011). The study was guided by the following research questions:

1. What perceptions do online course developers (i.e., DE Office, ID Team, IDs and instructional faculty within colleges and schools) at the university have about incorporating UDL strategies into the online course development process?
2. What factors impact the adoption/rejection of UDL strategies by instructional faculty teaching online courses at the university?

3. Which course elements do online course developers and students at the university perceive as most beneficial to the online teaching and learning process and how do they align with UDL principles and practices?

## **Methodology**

In terms of structure, a three-step method was adopted, similar to Kizawa et al. (2012), to develop the initial questionnaire. Step 1 was broken into two parts:

- (A) Six, semi-structured interviews with instructional designers and DE staff regarding their perspectives on the integration of UDL strategies into the online course development process.
- (B) Creation of the initial questionnaire by a group of the various stakeholders involved in the online course development process.

Step 2 involved a four-round modified decision-making Delphi method to achieve consensus from a panel of online learning experts across the university on the course elements that should be integrated into the online course development process; and Step 3 reconvened the Step 1 – Part B panel to finalize the results (Figure 2).

## **Discussion of Findings in Relationship to Research Question 1**

RQ1: What perceptions do online course developers (i.e., DE Office, ID Team, IDs and instructional faculty within colleges and schools) at the university have about incorporating UDL strategies into the online course development process?

**Summary and discussion.** Findings from the Fall 2014 and Spring 2015 DE Course Portfolio Rating Sheets revealed that the integration of accessible design practices (item #12) received the lowest average score (i.e., 3.48 and 3.24, respectively) across all

of the courses for the 30 items measured on this instrument. Compare this score to item #3 (i.e., Syllabus and course schedule are thorough -- including major components such as outcomes, assignments, readings, grading policy, due dates, etc.), which scored roughly a point higher (4.42 and 4.26, respectively) and focuses on areas commonly addressed by faculty members when working with an instructional designer. Feedback from the semi-structured interviews revealed a number of factors contributing to these low scores.

*Providing accommodations versus integrating accessibility* was one of the major themes to come out of the semi-structured interviews. Responses suggest that faculty members are overwhelmingly supportive of providing a student with a disability an accommodation in their courses. This is also supported in the literature where faculty members, regardless of their knowledge of both the disability laws and/or their academic responsibilities, are willing to provide accommodations to students with disabilities who are enrolled in their courses (Bourke, Strehorn, & Silver, 2000; Dy, 2005). On the other hand, when it comes to integrating accessible design practices when there is no perceived need, faculty members are resistant. Collectively, the IDs mentioned that this attitude is more common than not. What the interviews uncovered, however, is that this attitude was evident not just in how IDs perceived faculty members, but also with some of the IDs themselves.

The ID-Faculty Partnership was another important theme discovered in this study. One of the most notable issues that this study uncovered was the inconsistency that exists with respect to how IDs approach and prepare faculty members to integrate UDL

strategies into their online courses. Some of the IDs are ambivalent about broaching the topic of integrating UDL strategies because some faculty members tend to just “shut down when they hear UDL”, as one ID stated. A number of studies have detailed how time-consuming it can be to integrate UDL strategies (Kumar, 2010; Kumar & Wideman, 2014; Rao & Tanners, 2011), which was highlighted at length in Chapter 4. As such, this compounds the ambivalence that many IDs feel when they are asking faculty members to contribute more hours to the course development process than they are used to.

IDs themselves are also part of the resistance. Some expressed concern about not being able to address all of the things that they need to cover in the online course development process with faculty members. As one ID commented, “online courses change more than you think”. Suggesting that it was not a good use of time to put a lot of time and resources into making course content accessible if there was no immediate need (i.e., accommodation request). This attitude and approach perfectly highlights one of the major barriers that impacts faculty buy-in. Furthermore, it emphasizes how important the ID/Faculty partnership is to the integration of UDL strategies at this university. If either party is resistant to adopting these strategies, then UDL strategies are less likely to be considered when a course is being developed.

### **Discussion of Findings in Relationship to Research Question 2**

RQ2: What factors, as perceived by the instructional designers, impact the adoption/rejection of UDL strategies by instructional faculty teaching online courses at the university?

**Summary and discussion.** The barriers to adoption comprise a number of factors that are often not contemplated when considering why a faculty member does not include UDL strategies in their online courses. On top of learning how to integrate UDL strategies, develop course content, and/or transition a face-to-face course to an online course, faculty members must also balance high teaching loads, conducting research, meeting/working with students, accreditation requirements, and concerns over promotion and tenure. Many of the IDs stated that faculty concerns regarding the integration of UDL strategies have more to do with factors like limited time, resources, and/or knowledge of how to teach online than anything else. Moriarty (2007) found the “lack of an inclusive mindset, lack of knowledge about pedagogy, high teaching loads, and a lack of time for instructional development” to be the most significant barriers to the adoption of inclusive pedagogies. Similarly, other researchers also cited a lack of time and a lack of knowledge about pedagogy as factors impacting the integrating of inclusive teaching practices (Bongey et al., 2010; Dallas et al., 2014; Nielsen, 2013; Schelly et al., 2011).

In addition to time constraints and knowledge limitations, academic factors (e.g., accreditation) and faculty incentives (i.e., promotion & tenure) were also mentioned by many of the IDs. IDs suggested that, as it relates to the integration of UDL strategies, faculty members would follow the lead of their academic department or chair over any others. Given that many of the IDs perceived top-down enforcement as lacking in this area, it is likely many academic departments are not requiring faculty members to integrate such practices in their online courses. While it may be easy to dismiss this as the “higher-ups” not caring about inclusive pedagogies, the literature suggests that the faculty

members themselves are partly to blame. Allen and Seaman (2013) reported that less than a third of chief academic officers in higher education believe that their faculty accept the value and legitimacy of online instruction. In addition to that, Seaman (2009) suggested that faculty members are oftentimes frustrated by the lack of incentives provided for online instruction. While these two findings may be true, I believe the issue has more to do with how the promotion and tenure process is structured at this university as opposed as opposed to a lack of belief in online education or frustration simply related to incentives. As stated earlier, instruction has a limited role in the promotion and tenure process at the university. As such, this would play a key role in limiting adoption of such practices by faculty developing and teaching online courses. If greater emphasis is placed on, for example, research or guiding graduate students, then faculty interested in promotion and tenure are more likely to focus heavily on those goals. Overall, this suggests that there must be a more coordinated effort between DL, the academic departments, and upper administration (e.g., Office of the Provost) to ensure that these practices are successfully integrated into the online course development process. Even if that means instruction playing a more significant role than it currently does in the promotion and tenure process.

Additional issues centered on barriers to the online learning process as a whole. To name a few, some academic departments are resistant to adding courses that are taught online to their existing programming, a number of faculty members are ill-prepared to teach online (i.e., teach with technology), and there is a shortage of qualified instructors to teach in online programs. While not specifically focused on the integration

of accessible design practices, each of these factors can play a significant role in why these strategies are not adopted by some faculty members and/or academic departments.

### **Discussion of Findings in Relationship to Research Question 3**

RQ3: Which course elements do online course developers and students at the university perceive as most beneficial to the online teaching and learning process and how do they align with UDL principles and practices?

**Summary and discussion.** In this section, we will discuss the Step 2 results in the context of how the Delphi Rounds were structured and how those findings align with UDL. The Delphi Rounds started with 69 course elements separated into three distinct categories: Items to include in the syllabus of an online course, Items that make up the presentation and navigation of an online course, and Factors to consider in designing the instructional materials for an online course. In all four Delphi Rounds, there was only one suggestion to amend the categories (See below). That suggestion was not made until Round Four. As such, the three original categories remained unchanged throughout the course of the Delphi Rounds.

As mentioned previously, the rounds were structured to align with the DL's practice of requiring faculty to have at least 60% of their online course complete by the 6-week Readiness Review (i.e., Rounds Three and Four) and 100% of the course complete by the start of the semester (i.e., Rounds One and Two). In Rounds One and Two, the panelists were asked to rate the extent to which each of the course elements listed in the initial questionnaire should be included in the development of an online course.

Consensus was achieved on 57 of the original 69 course elements included in the initial questionnaire (See Tables 5 through 11).

***Rounds one and two.*** Seven of 28 course elements in the Syllabus section (Items 3, 12, 13, 17, 18, 19) were rated by all of the panelists (100%) as Desirable or Essential (See Table 14). Evaluating this section broadly, sixteen of the 28 course elements (57%) were rated as Desirable or Essential by at least 16 out of 18 of the panelists (89%). Considering the heterogeneity of the disciplines taught by the faculty members (e.g., special education, instructional technology, applied information technology, math, etc.), these findings establish a collective set of course elements to be included in the syllabus for all online courses.

Table 13

*Items rated as either Desirable or Essential by all panelists (Syllabus)*

Item #	Course Element
3	Basic Course Information
12	Technology Requirements for Course
13	Identify course activities that go beyond standard online course participation
17	Grading scale
18	Attendance and Participation Requirements (if applicable)
19	Course Policies

*Note:* Items 1, 2, 4, 8, 11, 14 were nearly unanimous (94%) with only one panelist dissenting.

Seven items did not meet consensus (Items 5, 20, 21, 22, 25, 26, and 28) in the Syllabus section. Items 20 (*Allow flexibility in submitting assignments electronically*) and 22 (*Additional course readings, if applicable, offered in multiple formats*) will be discussed in detail in the next section (Aligning Course Elements with UDL). These items were part of the group of UDL strategies that were integrated during the development of the initial questionnaire. Items 21, 25, 26, and 28 were notable in that many panelists felt it was not necessary to include these items in the syllabus. As one panelist stated, “these are not specific to a course so they need not be included in a specific course syllabus.” This was common amongst several of the panelists who offered responses. Collectively, it was argued that this information should be posted within the course shell or hosted on a separate website that faculty members can reference for students. Responses to item 5 (*Blackboard login Instructions*) indicated that panelists were not so much disagreeing that this information should be provided, but rather when that information is made available to students. Most comments suggested that it is essential to send out this information to students (via email) prior to the start of the course. This would ensure that students were able to access the course site when it became available.

Only two of the 23 course elements in the Course Presentation and Navigation section (Items 30 and 47) were rated by all of the panelists (100%) as *Desirable* or *Essential* (See Table 15). Evaluating this section broadly, 13 of the 23 course elements (57%) were rated at *Desirable* or *Essential* by at least 16 out of 18 of the panelists. Many of the course elements in this section start to intrude on how a faculty member might

teach a course. For that reason, there were more dissenting opinions in this section than the previous. For example, item 50 calls for all tests and quizzes to be designed within Blackboard course shell. This question, unfortunately, implies that all online courses use tests and quizzes as a form of assessment. Some panelists responded that these types of assessment could be delivered using another platform, while others echoed my previous comments suggesting that the type of assessment used in the course depends on the course content.

Table 14

*Items rated as either Desirable or Essential by all panelists (Course Presentation and Navigation)*

Item #	Course Element
30	Course has a well-designed landing page
47	All unused course tools are hidden

*Note:* Items 33, 38, and 46 were nearly unanimous (94%) with only one panelist dissenting.

In the Design of Instructional Materials section, only two of the 18 course elements (Items 52 and 65) were rated by all of the panelists (100%) as *Desirable* or *Essential* (See Table 16). Surprisingly, however, 14 of the 18 course elements (78%) were rated as *Desirable* or *Essential* by at least 16 out of 18 of the panelists. In my opinion, some of the responses in this section may be evidence of participant bias. In my role addressing technology accessibility at this university, some of the panelists appear to

have given politically correct responses as opposed to their honest opinions. For example, one panelist, in response to making Word documents accessible, commented that “these are obviously important for accessibility, so I'm going to say Essential on all of them even though I didn't know some of these things before.” Another panelist, in their comments about making PPT documents accessible, stated that “my desirable vs. essential distinctions here are almost arbitrary because I don't know the value of some of these features.”

Another way to examine this data, however, is that while some panelists may not honestly know how to make things accessible, they recognize the benefits of integrating these UDL strategies into their online courses. One panelist, in referencing PPT documents, stated that “[adding alt text to images] is important, but I do not know if all faculty know how to do this.” Others suggested that faculty members would require a great deal of training to accomplish some of these tasks. Comments like these suggest that the hard part of getting faculty to buy-in is accomplished. The next steps would be to ensure that faculty have clear guidance on what is required and how to get adequate support to ensure they can successfully implement these types of strategies.

Table 15

*Items rated as either Desirable or Essential by all panelists (Design of Instructional Materials)*

Item #	Course Element
52	All videos contain synchronized and accurate captions

*Note:* Items 54, 57, 63, 64, and 69 were nearly unanimous (94%) with only one panelist dissenting.

***Rounds three and four.*** In Rounds Three and Four, the expert panelists were asked to reexamine the findings from the two initial rounds and identify the 10 most important course elements from each of the remaining categories (e.g., Syllabus). During the Step 1 focus group, it was mentioned that while the DL established this arbitrary benchmark of 60% complete by the 6-week Readiness Review, there are no clear indicators for which course elements should be included in that 60% benchmark. The findings from these last two rounds were intended to simulate the bare minimum that should be included in an online course 6-weeks prior to the start of the semester. Consensus (> 50% LOA) was achieved on 32 of the 57 course elements (56.1%) from Rounds One and Two. This amounts to roughly 60% and could be used as a way to define those course elements that should be included by the 6-week readiness review.

In the Syllabus section, consensus was achieved on items 1, 3, 4, 7, 8, 10, 12, 14, 15, 17, and 18 (See Table 17). Items 1, 8, 10, and 17 were identified by at least 75% of the panelists (approx. 13 out of 18) as most important to include in the course syllabus. These findings corroborate those presented in Rounds One and Two (see Table 4), indicating clear agreement between the majority of the panelists on the most important items to include in the course syllabus.

Table 16

*Items achieving more than 50% Avg. LOA by panelists (Syllabus)*

Item #	Course Element
1	Instructor information
3	Basic course information
4	Nature of course delivery
7	Course description
8	Required textbooks
10	Course learning objectives/outcomes
12	Technology requirements for the course
14	Weekly course schedule presented in a tabular format
15	Assignment description
17	Grading scale
18	Attendance and participation requirements

In the Course Presentation and Navigation section, consensus was achieved on items 29, 30, 31, 32, 34, 35, 37, 38, 39, and 47 (See Table 18). Items 29, 30, 37, 38, and 39 were identified by at least 75% of the panelists as most important to include in the course syllabus. These findings corroborate those presented in Rounds One and Two (see Table 5), indicating clear agreement between the majority of the panelists on the most important items to include in the course presentation and navigation.

Table 17

*Items achieving more than 50% Avg. LOA by panelists (Course Presentation and Navigation)*

Item #	Course Element
29	Instructor uses Blackboard, Blackboard Collaborate, or a comparable accessible learning management system to facilitate delivery of the course
30	Course has a well-designed landing page
31	Weekly Announcement has been set up, either on the Home Page or a separate page
32	Welcome email sent at least once to each student prior to start of course
34	Course includes link “Begin Here” or “Start Here”, which Includes clear instructions for getting started
35	Syllabus made available in alternative formats
37	Separate units for each week (or a specified time period) with specific dates
38	Units have consistent structure
39	Links to recorded lectures/presentations are provided and working
47	All unused course tools are hidden

In the Design of Instructional Materials section, consensus was achieved on items 52, 53, 54, 60, 61, 63, 64, 65, 66, 67, 69 (See Table 19). Items 52, 53, 61, 65, and 67 were identified by at least 75% of the panelists as most important to include in the course syllabus. These findings corroborate those presented in Rounds One and Two (see Table

6), indicating clear agreement between the majority of the panelists on the most important items to include consider in the design and selection of the instructional materials.

Table 18

*Items achieving more than 50% Avg. LOA by panelists (Design of Instructional Materials)*

Item #	Course Element
52	All videos contain synchronized and accurate closed captions
53	Text transcripts are available for each audio or video file
54	All video player controls are keyboard accessible
60	All headings have been formatted using <i>Style</i> elements (e.g., Heading 1, Heading 2, etc.)? (WORD)
61	All images, grouped images, complex images (i.e., charts and graphs), tables, SmartArt graphics, and non-text elements that convey information have meaningful alternative-text descriptions? (WORD)
63	Avoid use of color only to convey meaning
64	All PDF documents are text-based and free of handwritten notes, underlines, comments, edits, etc.
65	All URLs (including email addresses) link to correct web destinations
66	All links have descriptive text, as opposed to just URL
67	All URLs (including email addresses) are keyboard accessible
69	Equivalent alternative provided for all inaccessible web-based supplemental resources used in the course

## **Aligning the findings with UDL**

**UDL principle I – providing multiple means of representation.** Items 9, 22, 35, 41, 52, 53, 56, 57, 58, 59, 60, 62, 63, 64, 65, 66, and 69 were identified as aligning with UDL Principle I, Providing Multiple Means of Representation. In Rounds One and Two, consensus was achieved on all, but item 22 (Offer additional course readings, if applicable, in multiple formats). The two highest rated UDL strategies falling under this principle were items 52 (i.e.,  $M = 2.61$ ,  $LOA = 100\%$ ), all videos contain synchronized and accurate closed captions, with responses dispersed evenly between *Desirable* and *Essential*, and 65 (i.e.,  $M = 2.94$ ,  $LOA = 100\%$ ), all URLs (including email addresses) link to their correct web destinations. All, but one panelist, rated this course element as *Essential*. Item 52 was most notable in that comments were from the student panelists. S1 stated a preference for having the text transcript because “reading it is more comprehensible for me than hearing at times”. S2 noted they use the captions when “there is a speaker that is hard to understand or has a heavy accent.” These comments echo findings from the literature which show that students without disabilities benefit just as much from closed captions and transcripts as those with disabilities (Başaran & Köse, 2013; Montero Perez, Van Den Noortgate, & Desmet, 2013; Rao & Tanners, 2011).

Item 22 had some of the lowest measures (i.e.,  $M = 1.72$ ,  $LOA = 61\%$ ) of any course element in the Syllabus section. Interestingly, item 22 had an IQR equal to 1, with responses dispersed fairly evenly between *Not so important* and *Desirable*. This was supported by the open-ended responses as panelists varied between agreement that multiple formats would be “beneficial” or “nice to have” and having concerns or

confusion about this type of instructional strategy. P1 agreed that “multiple formats would be nice to have,” but also felt “this would create a significant workload for faculty.” These comments mirror feedback from the semi-structured interviews (Step 1A), demonstrating that faculty members are resistant to the inclusion of UDL and accessibility when it results in increased workloads. Comments from other panelists indicated that they were unsure about what formats should be offered. Moriarty (2007) demonstrated that time constraints and technological competency can greatly impact faculty adoption of inclusive teaching practices. As it relates to faculty adoption of UDL strategies, I would add that confusion and a lack of clarity with respect to what is expected or required can be equally as impactful. For example, P2 stated that instructors should be able to “recommend/require different materials in different media, but should not have to convert a single piece of content to multiple formats.” Similarly, P3 commented that “a standard, accessible format should be used rather than trying to coordinate consistency in the content between the formats.” Another panelist inquired about the most appropriate formats for students with sensory impairments (i.e., blind, low vision, deaf, and hard of hearing), stating that they received limited guidance on expectations for integrating UDL strategies when the course development process was started. These comments hint at the myriad of challenges related to improving faculty adoption of these strategies.

**UDL principle II – providing multiple means of action and expression.** Items 20, 29, 30, 31, 34, 36, 37, 38, 51, 54, 55, 67, and 68 were identified as aligning with UDL Principle II, Providing Multiple Means of Action and Expression. In Rounds One and

Two, consensus was achieved on all, but item 20 (Allow flexibility in submitting assignments electronically). Items 55 (All slides contain unique slide titles) did not achieve consensus until Round Two. The highest rated UDL strategy falling under this principle was item 30 (i.e.,  $M = 2.61$ , LOA = 100%), course has a well-designed landing page. Panelists' responses were almost evenly dispersed between Desirable and Essential.

During Rounds One and Two, the LOA for item 20 actually decreased from 61% to 33%. The IQR increased from 1.00 to 2.00. These numbers indicated a significant level of disagreement amongst the panelists. Two consistent themes emerged from the responses to this UDL strategy: (1) several panelists agree that flexible assignment submissions should only be offered on a case-by-case basis (e.g., disability accommodation) and (2) faculty members rely heavily on the LMS to organize communications and track assignment submissions. A number of panelists commented that flexible assignment submission is desirable on a case-by-case basis, but in effect places more of a burden on the faculty member when it comes to tracking where assignments have been submitted. Furthermore, this can add extra steps in terms of managing communications or integrating grades into the LMS. P4 stated that "it is unreasonable to expect professors to organize assignments [submitted] in different places and in different formats". While this panelist also expressed a willingness to be flexible on a case-by case basis, they were clear with their students that this was more the exception and not the rule. P5 suggested that only "a single method of submission should be allowed". Similarly, other panelists stated that unless there is an "accessibility issue" or the adjustment is being made as "an accommodation for a student with a disability", all

assignments should be submitted the same way. These comments are consistent with previous research on faculty perspectives regarding the provision of disability-related accommodations in higher education (Baker et al., 2012; Burgstahler, 2012; Dy, 2005; Lombardi & Murray, 2011).

Surprisingly, many panelists eluded to the ability of the LMS to support faculty members with more easily tracking assignments, providing assignment rubrics, and managing course grades. P6 suggested that using the LMS aids with “avoiding potential confusion, duplication, and lost assignments”. These types of comments contradict findings from the semi-structured interviews, which suggested that many faculty members don’t know how to teach with technology and, therefore, may be resistant to the integration of UDL strategies in online courses as a result. On the contrary, the responses suggest that these particular panelists are able to make nuanced decisions about why they are more agreeable to certain types of UDL strategies than others. This is supported by the fact that panelists were agreeable on the majority of UDL strategies included in the initial questionnaire.

**UDL principle III – providing multiple means of engagement.** Items 13, 14, 15, 16, 32, 45, 46 and 47 were identified as aligning with UDL Principle III, Providing Multiple Means of Engagement. In Rounds One and Two, consensus was achieved on all, but item 45 (Instructor should model the first online discussions and have examples of exemplary posts for students). Item 32 (Welcome email sent at least once to each student prior to start of the course) did not achieve consensus until Round Two. The highest rated UDL strategies falling under this principle were items 13 (i.e.,  $M = 3.00$ ,  $LOA = 100\%$ ),

Identify course activities that go beyond standard online course participation, and 47 (i.e.,  $M = 2.56$ ,  $LOA = 100\%$ ), All unused course tools are hidden. Item 13 was rated as Essential by all of the panelists, while item 47 saw panelists evenly split between Desirable and Essential.

In Rounds One and Two, item 45 maintained an  $IQR = 2.00$  and a  $LOA = 72\%$ . Panelists could not find agreement on the appropriate use of discussions in an online course. Much of this could possibly be attributed to the heterogeneous nature of the disciplines taught by the panelists (e.g., Calculus, Special Education, etc.). For example, one panelist commented that “discussions are not necessary for every class”, suggesting later that demographics and the purpose of the discussions play a key role as to whether or not they should be used in a particular course. Other panelists echoed this need for flexibility, arguing that the “progression of the course” should dictate whether or not detailed guidelines and expectations are necessary. Contrary to this, however, one panelist remarked that “students are not as savvy as one would expect of graduate students”. For that reason, they suggested that detailed explanations and expectations should be required for all communications within the LMS. On a similar note, another panelist described how it is “better to provide [the students] strategies for writing discussions in chunks over time”. This divergence of opinions explains why the  $IQR$  stayed so high from one round to the next. It also demonstrates how this particular UDL strategy could encroach on the instructional preferences of the faculty member, eliciting pushback.

## **Practical Implications**

Appendices Q and R comprise the finalized results of this Delphi study. Appendix Q, which has 57 course elements, represents all of the course elements that should be included in the online course when it is launched. Appendix R, with 32 course elements, offers the DE Office and ID Team a baseline for what faculty members should have accomplished approximately 6-weeks from course launch. This is a critical component in evaluating faculty progress as it relates to the development to their online course. It also affords these units the ability to establish benchmarks that could be used in self-paced online course development training modules. The DE Office and ID Teams only address approximately one-third of the university's online course offerings; self-paced modules may allow them to reach instructional faculty teaching online without the support of these offices. In addition to that, these modules could potentially mirror the guided assistance that is currently offered (i.e., 4P Process, OCDI). These kinds of strategies would improve the standardization of what is included in all online courses at the university. In addition to that, this improves the adoption of UDL strategies in the online course development process in a manner that is less threatening to instructional faculty that have limited experience with UDL and accessibility. Long term, this also raises faculty awareness of UDL strategies.

Another practical benefit is how closely these findings align with the original 6-week Readiness Checklist (Appendix B) that the DE Office and ID Team currently uses. This, along with the heterogeneity of the disciplines covered by the instructional faculty

participating in this study, suggests that it could be easily adopted and broadly implemented by faculty teaching online courses at this university.

### **Future Implications**

This study advances the discussion on the perspectives of those faculty/staff involved in the online course development process regarding the implementation of UDL strategies into the online classroom. The findings could act as the foundation for future studies in understanding the diffusion of inclusive pedagogies in a higher education setting.

Future studies should compare/contrast faculty attitudes regarding the implementation of UDL strategies with the benefits that students derive from these strategies. Rao and Tanner (2011) conducted a case study on the design and development of a course that integrating UDL strategies. The study not only tracked what course elements were implemented into the case study, but also student perceptions regarding the benefits of those course elements. Similarly, other studies have evaluated student perceptions related to such practices (Schelly et al., 2011). What is missing in the literature, however, is research on the impact that these strategies have on student outcomes (i.e., grades). This researcher was only able to identify a few studies measuring the impact of UDL strategies on student outcomes in higher education (Davies et al., 2013; Wilson et al., 2011). Of these, only one actually considered grade data (Wilson et al., 2011). Future research must take in account the impact of these strategies on grades as a means for improving buy-in by academic departments in higher education.

This study revealed a great deal about the role of the *ID/Faculty partnership* in improving the adoption of UDL strategies in the online course development process. The lack of an enforcing mechanism (i.e., Provost's Office, Academic Units) to push the implementation of UDL strategies has also greatly impacted its adoption at this institution. While the grassroots efforts highlighted by support offices like distance education, instructional design, and the disability support offices, more effective outreach needs to occur in the academic units in order for true adoption of UDL strategies to occur. Rogers (1983) discussed the role of *change agents* and *opinion leaders* in the diffusion process, and how they are determined by the social system itself. In order to understand the most effective way to implement these practices, future studies need to look at the role that department chairs, senior faculty, assistant deans, deans, and other individuals in these upper-level positions play in ensuring that these practices are adopted.

Finally, while the online questionnaires were effective in coming to a decision regarding the panelists' self-reported perceptions as it relates to the integration of UDL strategies into the online course development process, it is the opinion of this researcher that more qualitative research is required in this area. The semi-structured interviews, focus group feedback, and open-ended response data were particularly valuable as it offered insight into not only the collective group's opinion, but also enabled panelists to understand what their fellow panelists were thinking. These findings provided a deeper understanding of the issues impacting the adoption of these strategies. For that reason, it

is imperative that future studies incorporate qualitative feedback like interviews, focus group discussions, document analysis, etc.

### **Limitations of this Study**

This study highlights the findings of a four-round modified decision-making Delphi study involving online course developers ( $n = 15$ ) and graduate students ( $n = 3$ ) at a 4-year research university in the Commonwealth of Virginia; the purpose was to integrate UDL strategies into the online course development process and raise faculty awareness about UDL at this university. Although eighteen participants are an acceptable number for a Delphi study, caution should be exercised in generalizing these results to the larger population. I would have liked to see more student participants as this would have allowed for comparison of the perspectives of faculty/staff participants versus those of students. Nonetheless, the findings relative to faculty perceptions regarding the integration of UDL strategies into classroom instruction and the opportunities/barriers that exist to improve faculty buy-in do align with the existing literature on this topic.

The instruments (i.e., online questionnaires) used in this study rely on self-report data, introducing participant bias. Although none of the participants were aware of who the other participants were, all were known to this researcher. I have worked for over 8 years as a technology accessibility manager at this university. In addition to that, I have had the pleasure of providing support services to some of the individuals that participated in this study. Given my role at this university and the sensitive nature of this topic, it is possible that participants offered politically correct responses as opposed to their honest feelings on these issues. Maxwell (2013) described this phenomenon as “reactivity”.

However, the author argues that while it is important to guard against reactivity in quantitative studies, it is more effective to understand its influence in qualitative studies. In the context of this study, this could provide some explanation for how well-received the UDL strategies in the *Design of Instructional Materials* section were received. As it relates to the qualitative data collected during the interviews, however, the participants appeared to be very comfortable detailing ID and faculty perceptions about the integration of UDL strategies in the online course development process. I did not get the impression that individuals were holding back or couching their language.

Adding to participant bias was the fact that participation in this study was voluntary. The purpose of the study was made known to all potential participants and, as such, it is likely that the participants had an interest in this topic area. This is evident in that some of the participants have experience applying UDL strategies and/or with supporting individuals with disabilities in the higher education classroom. This could potentially skew overall results to show more favorable perceptions towards UDL strategies than would be evidenced in a study that includes a larger sample size. Given that, however, the actual UDL strategies were embedded in the online questionnaire amongst a number of other course elements. The strategies identified as UDL-specific vs. non-UDL were not made known to the panelists.

The timing of this study was another limitation. The first questionnaire was not sent until the end of March, which only left about 6 weeks until the end of the semester and the beginning of the summer. I was cognizant of this timeline and had to strictly adhere to the schedule between rounds to ensure we did not lose participants in later

rounds. This may have limited some of the participants' ability to review and process responses from other panelists between rounds Two-Three and Three-Four.

## **Conclusion**

This Delphi study sought to integrate UDL strategies into the online course development process at this university and raise faculty awareness of these strategies in doing so. I believe this was accomplished, as consensus was achieved on almost all (35 out of 38) of the UDL strategies integrated into the initial questionnaire.

The semi-structured interviews revealed some techniques that have been successful in improving faculty buy-in (i.e., provide a consistent approach toward the integration of UDL strategies in online courses; UDL strategies should be more prescriptive; and, focus should be on inclusive design practices). These findings laid the groundwork for the development of the initial questionnaire and the integration of the UDL strategies. We also learned that UDL strategies are generally positively perceived by faculty, unless they encroach on one's instructional flexibility. Some disciplines require rigid guidelines (e.g., nursing) or do not use particular formats (i.e., PPT) and, thus, do not feel the need for certain types of UDL strategies.

One significant outcome derived from this study was that the DL has already started adjusting how online courses are evaluated for UDL and accessibility at this university. In addition to that, training on UDL and accessibility are now a core part of the online course development process at the university. Although the DL only oversees 30-40% of all of the online courses developed at the university, some academic units (not

covered by DL, but also offering online programming) have started to reach out directly for training and support on integrating UDL strategies as well.

Going forward, efforts are being made to standardize training resources around UDL and accessibility so that online course developers are always presented with clear, consistent information. Consistent messaging was one of the major issues mentioned when we discussed barriers earlier.

## Appendix A

### IRB Approval Letter



#### Office of Research Integrity and Assurance

Research Hall, 4400 University Drive, MS 8D5, Fairfax, Virginia 22030  
Phone: 703-993-5445; Fax: 703-993-8590

DATE: October 27, 2015

TO: Kevin Clark, PhD  
FROM: George Mason University IRB

Project Title: [813300-1] Integrating UDL Principles and Practices in the Course Development Process: A Delphi Study

SUBMISSION TYPE: New Project

ACTION: APPROVED

APPROVAL DATE: October 27, 2015

EXPIRATION DATE: October 26, 2016

REVIEW TYPE: Expedited Review

REVIEW TYPE: Expedited review category #7

Thank you for your submission of New Project materials for this project. The George Mason University IRB has APPROVED your submission. This submission has received Expedited Review based on applicable federal regulations.

Please remember that all research must be conducted as described in the submitted materials.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require that each participant receives a copy of the consent document.

Please note that any revision to previously approved materials must be approved by the IRB prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to the Office of Research Integrity & Assurance (ORIA). Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed (if applicable).

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to the ORIA.

The anniversary date of this study is October 26, 2016. This project requires continuing review by this committee on an annual basis. You may not collect data beyond this date without prior IRB approval. A continuing review form must be completed and submitted to the ORIA at least 30 days prior to the

anniversary date or upon completion of this project. Prior to the anniversary date, the ORIA will send you a reminder regarding continuing review procedures.

Please note that all research records must be retained for a minimum of five years, or as described in your submission, after the completion of the project.

If you have any questions, please contact Bess Dieffenbach at 703-993-5593 or [edieffen@gmu.edu](mailto:edieffen@gmu.edu). Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within George Mason University IRB's records.



## Office of Research Integrity and Assurance

Research Hall, 4400 University Drive, MS 6D5, Fairfax, Virginia 22030  
Phone: 703-993-5445; Fax: 703-993-9590

DATE: September 21, 2016

TO: Kevin Clark, PhD  
FROM: George Mason University IRB

Project Title: [813300-3] Integrating UDL Principles and Practices in the Course Development Process: A Delphi Study

SUBMISSION TYPE: Continuing Review/Progress Report

ACTION: APPROVED

APPROVAL DATE: September 21, 2016

EXPIRATION DATE: September 20, 2017

REVIEW TYPE: Expedited Review

REVIEW TYPE: Expedited review category #7

Thank you for your submission of Continuing Review/Progress Report materials for this project. The George Mason University IRB has APPROVED your submission. This submission has received Expedited Review based on applicable federal regulations.

Please remember that all research must be conducted as described in the submitted materials.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require that each participant receives a copy of the consent document.

Please note that any revision to previously approved materials must be approved by the IRB prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to the Office of Research Integrity & Assurance (ORIA). Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed (if applicable).

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to the ORIA.

The anniversary date of this study is September 20, 2017. This project requires continuing review by this committee on an annual basis. You may not collect data beyond this date without prior IRB approval. A continuing review form must be completed and submitted to the ORIA at least 30 days prior to the

anniversary date or upon completion of this project. Prior to the anniversary date, the ORIA will send you a reminder regarding continuing review procedures.

Please note that all research records must be retained for a minimum of five years, or as described in your submission, after the completion of the project.

If you have any questions, please contact Bess Dieffenbach at 703-993-5593 or [edieffen@gmu.edu](mailto:edieffen@gmu.edu). Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within George Mason University IRB's records.

## **Appendix B**

### **Original 6-Week Readiness Review Checklist**

<b>Main Section</b>	<b>Sub-Section</b>	<b>Original Checklist Items</b>
<i>Syllabus</i>	Basic Information	Instructor Information (name, contact information -- preferred and alternate)
		Office Hours (online and/or in person office hours)
		Basic Course Information (course number/section, title, credit hours)
		Nature of Course Delivery (asynchronous, synchronous, required face-to-face meetings/exams)
		Blackboard Login Instructions
		E-reserve Instructions, if applicable
	About the Course	Course Description (About the course/subject, prerequisites, etc.)
		Required Textbooks
		Course Learning Objectives/Outcomes
		Gen Ed Learning Outcomes or Program Learning Outcomes, if applicable
	Course Schedule	Technology Requirements
		Weekly Course Schedule presented in a tabular format (includes units/modules with start-and-end dates, delivery mode if in hybrid course, readings, assignments, due dates, point values)
	Assignments and Grading	Assignment Description (Due dates, requirements/expectations, criteria for grading/rubrics, points and/or percentages)
		Grading Scale
		Attendance and Participation Requirements (if applicable)
		Course Policies (late work, make-up exams, extra credit, incompletes, etc.)

Additional Course Resources	Recommended Course Resources (readings, tutorials, external websites, exhibitions, field trips, multimedia resources, etc.), if applicable
University Requirements	Academic integrity
	Disability Accommodations
	Diversity, Religious Holidays, etc.
	Student Privacy
	Student Responsibilities
	Student Services (Library, Writing Center, Counseling, etc.)
Homepage	Course has a well-designed landing page (may include course visuals, announcements, to-do list or what's due)
Announcements	Weekly Announcement has been set up, either on the Home Page or a separate page.
	Instructor bio, picture, and contact info are present
	Includes a warm welcome message to students (audio, video, and/or text-based)
	Course includes link "Begin Here" or "Start Here", which Includes clear instructions for getting started
Syllabus	Syllabus can be navigated easily (e.g., consistent use of headers or styles in WORD document, PDF file with bookmarks, etc.)
	Print version of syllabus available
Weekly Units	Separate units for each week (or a specified time period) with specific dates

<i>Accessibility</i>		Units having consistent structure (e.g., introduction to the topic, learning objectives, readings, mini-lectures, labs, assignments including how/where students will participate or submit, discussions, etc.).
		Links to recorded lectures/presentations are provided and working
		Link to external websites, e-book, YouTube, etc. are working
		Includes all graded and non-graded assignments for the week. Graded assignments should include associated grading criteria/rubrics
		60% of the course content is completed (100% of course to be completed one week before the semester starts)
	Online Discussions	Discussion/Blog/Journal prompts and descriptions have been created in Blackboard
	Course Tools	Available to students as applicable for the course (e.g., MyGrades, Email, Collaborate, Blog, SafeAssign, etc.)
	Student Resources	Includes links to Student Responsibilities and Services modules pages Includes access to Blackboard Help/FAQs
	Tests/Quizzes (if applicable)	Tests/Quizzes are developed in Blackboard with assigned points
	Audio and Video	All videos are captioned or have transcripts
	PowerPoint	Accessible PowerPoint slides are available for each lecture/presentation with the videos
	Word	All Word documents are accessible
	PDF	All PDF documents are text-based and fully accessible

Links to External  
Resources

All publisher-provided resources are  
accessible, or alternative equivalent  
resources or strategies are provided

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*Note.* DE Office's 6-week Readiness Checklist. Copyright 2015 by George Mason University. Reprinted with permission.

## Appendix C

### Distance Education Course Portfolio Rating Sheet (Fall 2015)

Course portfolio review focuses on the effectiveness and, when applicable, the comparability of a DE course to its face-to-face equivalent as demonstrated from the resources presented in a portfolio. These are the criteria and questions used by reviewers for the portfolio/course reviews.

To what extent does the course portfolio demonstrate the following?	5 Strongly agree	4	3	2	1 Strongly disagree	Not applicable	Not able to judge
<b>Learning Outcomes</b>							
1. Learning outcomes are clear (provide explicit expectations for student learning).							
2. Course learning outcomes are communicated to students through syllabus.							
3. Syllabus and course schedule are thorough (including major components such as outcomes, assignments, readings, grading policy, due dates, etc.).							
4. Course assignments and learning activities are well-designed.							
5. Course assignments allow students to demonstrate intended course outcomes.							
6. Grading criteria for assignments are explained and/or rubrics are provided.							
7. <i>If applicable</i> , learning outcomes are in alignment with the general education outcomes for the relevant category.							
<b>Course Presentation</b>							
8. The course includes a clear instruction on how to get started and where to find various course components.							

To what extent does the course portfolio demonstrate the following?	5 Strongly agree	4	3	2	1 Strongly disagree	Not applicable	Not able to judge
9. Content is made available or “chunked” in manageable segments to enhance student learning.							
10. Navigation throughout the online components of the course is logical, consistent, and efficient.							
11. The course includes high quality multimedia learning resources.							
12. The course employs accessible technologies or strategies (e.g., alt text, transcripts, close captioning, etc.)							
13. The course provides on how to obtain accommodation guidance to students with special needs.							
<b>Participation and Interaction</b>							
14. Participation (in-class discussion, group conferences, blogs, wiki, etc.) expectations are communicated to students.							
15. Interaction among students is evident.							
16. Timely feedback is provided to students regarding their work.							
17. Samples of discussion board/wiki/blog demonstrate students’ critical thinking.							
<b>Learning Support</b>							
18. The selection and use of technologies are appropriate for delivering the course content.							
19. The selection and use of technologies are appropriate for achieving course learning outcomes.							
20. Course specific technology requirements are communicated to students.							
21. Ample resources (tutorials, models, examples, etc.) are available to students.							
<b>Faculty Reflection</b>							
22. Clear reflection on how well the course achieved the intended outcomes							
23. Uses assessment results to improve student achievement							

To what extent does the course portfolio demonstrate the following?	5 Strongly agree	4	3	2	1 Strongly disagree	Not applicable	Not able to judge
24. Clear reflection on the experience of using selected technologies for achieving course outcomes							
25. Clear reflection on the future direction of the course (i.e., plans for continuous improvement)							
<b>Course Comparability</b> (when an equivalent face-to-face course is available)							
26. Comparable course learning outcomes							
27. Comparable quantity of course content							
28. Comparable quantity of course assignments							
29. Comparable rigor of course assignments							
30. Comparable outcomes demonstrated by students (i.e., assignment grades, quality of discussions or group work)							

### ***COMMENTS***

31. What elements/features from the course would you recommend to other faculty members who teach distance education courses?
32. In terms of addressing the course learning outcomes, what suggestions would you give to the faculty member?
33. What other comments would you like to make about the course?

*Note.* DE Office's Course Portfolio Rating Sheet. Copyright 2015 by George Mason University. Reprinted with permission.



## Appendix D

### Quality Scorecard for the Administration of Online Programs (OLC) [Sample]

# Quality Scorecard

## for the Administration of Online Programs

**0 = Deficient    1 = Developing    2 = Accomplished    3 = Exemplary**

### INSTITUTIONAL SUPPORT (27 POINTS)

SCORE


<b>1</b>	The institution has a governance structure to enable clear, effective, and comprehensive decision making related to online education.	
<b>2</b>	The institution has policy and guidelines that confirm a student who registers in an online course or program is the same student who participates in and completes the course or program and receives academic credit. This is done by verifying the identity of a student by using methods such as (a) a secure login and passcode, (b) proctored examinations, or (c) other technologies and practices that are effective in verifying student identity.	
<b>3</b>	The institution has a policy for intellectual property of course materials; it specifically addresses online course materials and is publicly visible online.	
<b>4</b>	The institution has defined the strategic value of online learning to its enterprise and stakeholders.	
<b>5</b>	The organizational structure of the online program supports the institution's mission, values, and strategic plan.	
<b>6</b>	The online program's strategic plan is reviewed for its continuing relevance, and periodically improved and updated.	
<b>7</b>	The institution has a process for planning and allocating resources for the online program, including financial resources, in accordance with strategic planning.	
<b>8</b>	The institution demonstrates sufficient resource allocation, including financial resources, in order to effectively support the mission of online education.	
<b>9</b>	The institution has a governance structure to enable systematic and continuous improvement related to the administration of online education.	

### TECHNOLOGY SUPPORT (21 POINTS)

SCORE

<b>1</b>	A documented technology plan that includes electronic security measures (e.g., password protection, encryption, secure online or proctored exams, etc.) is in place and operational to ensure quality, in accordance with established standards and regulatory requirements.*	
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Note: The order of quality indicators within each category does not signify rank of importance. They are provided in random order.



**ONLINE LEARNING  
CONSORTIUM**  
IMPROVING THE QUALITY OF ONLINE EDUCATION

© 2014 Online Learning Consortium    **1**

## Appendix E

### Inclusive Teaching Strategies Inventory (ITSI): Subscales, Items, and Response Stems

Response Stem	Attitudes: <i>I believe it's important to...</i> Actions: <i>I do...</i>
Subscale	Item
Accommodations	<p>allow students with documented disabilities to use technology (e.g. laptop, calculator, spell checker) to complete tests even when such technologies are not permitted for use by students without disabilities</p> <p>provide copies of my lecture notes or outlines to students with documented disabilities</p> <p>provide copies of my overhead and/or PowerPoint presentations to students with documented disabilities</p> <p>allow flexible response options on exams (e.g. change from written to oral) for students with documented disabilities</p> <p>allow students with documented disabilities to digitally record (audio or visual) class sessions</p> <p>make individual accommodations for students who have disclosed their disability to me</p> <p>arrange extended time on exams for students who have documented disabilities</p> <p>extend the due dates of assignments to accommodate the needs of students with documented disabilities</p>
Accessible Course Materials	<p>use a course website (e.g. Blackboard or faculty web page)</p> <p>put my lecture notes online for ALL students (on Blackboard or another website)</p> <p>post electronic versions of course handouts</p> <p>allow students flexibility in submitting assignments electronically (e.g. mail attachment, digital drop box)</p>
Course Modifications	<p>allow a student with a documented disability to complete extra credit assignments</p> <p>reduce the overall course reading load for a student with a documented disability even when I would not allow a reduced reading load for another student</p>

	<hr/> reduce the course reading load for ANY student who expresses a need <hr/> allow ANY student to complete extra credit assignments in my course(s) <hr/>
Inclusive Lecture Strategies	<hr/> repeat the question back to the class before answering when a question is asked during a class session <hr/> begin each class session with an outline/agenda of the topics that will be covered <hr/> summarize key points throughout each class session <hr/> connect key points with larger course objectives during class sessions <hr/>
Inclusive Classroom	<hr/> use technology so that my course material can be available in a variety of formats (e.g. podcast of lecture available for download, course readings available as mp3 files) <hr/> use interactive technology to facilitate class communication and participation (e.g. Discussion Board) <hr/> present course information in multiple formats (e.g. lecture, text, graphics, audio, video, hands-on exercises) <hr/> create multiple opportunities for engagement <hr/> survey my classroom in advance to anticipate any physical barriers <hr/> include a statement in my syllabus inviting students with disabilities to discuss their needs with me <hr/> make a verbal statement in class inviting students with disabilities to discuss their needs with me <hr/> use a variety of instructional formats in addition to lecture, such as small groups, peer assisted learning, and hands on activities <hr/> supplement class sessions and reading assignments with visual aids (e.g. photographs, videos, diagrams, interactive simulations) <hr/>
Inclusive Assessment	<hr/> allow students to demonstrate the knowledge and skills in ways other than traditional tests and exams (e.g. written essays, portfolios, journals) <hr/> allow students to express comprehension in multiple ways <hr/> be flexible with assignment deadlines in my course(s) for ANY student who expresses a need <hr/> allow flexible response options on exams (e.g., change from written to oral) for ANY student who expresses a need <hr/>

Response stem	<i>I am confident in...</i>
Disability Law & Concepts	my understanding of the Americans with Disabilities Act (1990)
	my responsibilities as an instructor to provide or facilitate disability related accommodations
	my knowledge to make adequate accommodations for students with disabilities in my course(s)
	my understanding of section 504 of the Rehabilitation Act of 1973
	my understanding of Universal Design
	my understanding of the legal definition of disability
Response stem	<i>I know...</i>
Campus Resources	I know a Disability Services office exists on this campus
	I know what type of services are provided by the Disability Services office on this campus
	I know students with documented disabilities on this campus receive adequate services from the Disability Services Office
	I know where I can find additional support at this university when students with disabilities are having difficulties in my course

*Note.* Inclusive Teaching Strategies Inventory: Subscales, items, and response stems. Retrieved from [http://mujoresearch.org/filedepot\\_download/13/10](http://mujoresearch.org/filedepot_download/13/10), 2012. Copyright 2012 by the University of Connecticut.

## **Appendix F**

### **Step 1A – Final Interview Protocol**

#### ***Online Course Development Process at Mason (Background)***

- Tell me a little about yourself....
  - How long have you worked at the university? Office you work in? How long have you been in that office?
  - What is your unit's role in the online course development process at your college/school? At the university, as a whole?
- My understanding of the overall online course development process at the university is that there is a bit of a 3-headed monster: The DE Office uses the 4P process (or some variation of it); LSS/ID Team uses the OCDI; and several units within the colleges and schools may use their own process. Is my understanding accurate? If not, could you clarify?
  - Could you discuss the process that your college/school/department follows?
  - What are the pros and cons of these existing processes? 4P? OCDI? Your unit's process?

#### ***Integrating Accessibility into the Online Course Development Process***

- What is your perspective on how online instructional faculty members respond to supporting a student with a disability in an online course?
  - Accommodation request? Building accessibility upfront?
  - How do faculty members respond when that request is made by you?
- Okay, you are an instructional designer and I ask you to integrate accessibility into the online course development process, how do you receive that request?
  - How do you and your colleagues define accessibility and is it consistent from one person to the next?
  - Does it matter if you say UDL (Universal Design for Learning) or accessibility?
  - Do you discuss the law at all? How do you try to promote adoption?
  - In your opinion, is education a large part of the problem? Inclusion in the promotion & tenure process?
- “*Accessible course design practices (i.e., captions, alt text, etc.) ...*” was the lowest rated item on the DE Office's Course Portfolio ratings reviews (Fall 2014, Spring 2015).

- What, in your opinion, causes online course developers (i.e., DE Office staff, ID Team staff, online instructional faculty) at the university to implement/not implement these practices?
- In your opinion, what incentives would get instructional faculty to integrate UDL principles and practices into the online course development process at the university?

## **Appendix G**

### **Step 1B – Recruitment Email**

Dear Sir or Madam,

Dr. Kevin Clark, PhD, and Korey Singleton, MEd, of the George Mason University's College of Education and Human Development, Division of Learning Technologies, are investigating the development of a course evaluation tool that incorporates universal design for learning principles and practices into the online course development process. The purpose of this research study is two-fold: (1) to develop a course observation tool that supports the principles of Universal Design for Learning (UDL) and (2) improves faculty awareness of UDL strategies.

If you agree to participate in this study, you will be asked to participate in 2-3 focus groups regarding your perceptions about the course elements most important to the online teaching and learning process. These groups will meet during the Fall 2015 semester. We estimate that each focus group will take approximately 60-90 minutes of your time.

Research records will be kept confidential, consistent with federal and state regulations. Only the investigators will have access to the data, which will be kept on a

password-protected computer. To protect your privacy, personal, identifiable information will not be collected. George Mason University's Office of Research Integrity & Assurance has reviewed this study.

If you have any questions or concerns about the survey, you may contact Korey Singleton at [ksinglet@gmu.edu](mailto:ksinglet@gmu.edu) or Dr. Clark at [kclark6@gmu.edu](mailto:kclark6@gmu.edu).

If you are interested in participating in this study, please follow this link, (To Be Developed).

Thank you for your time and consideration with this matter.

Regards,

## **Appendix H**

### **Step 1B – Informed Consent**

#### **RESEARCH PROCEDURES**

The purpose of this research study is two-fold: (1) to develop and refine a course observation tool that supports the principles of Universal Design for Learning (UDL) and (2) improves faculty awareness of UDL strategies.

If you agree to participate in this study, you will be asked to participate in 2-3 focus groups regarding your perceptions about the course elements most important to the online teaching and learning process. These groups will meet during the Fall 2015 semester. We estimate that each focus group will take approximately 60-90 minutes of your time.

#### **RISKS**

There are no foreseeable risks for participating in this research.

#### **BENEFITS**

You will further research in accessible course design.

#### **CONFIDENTIALITY**

The data in this study will be confidential. Your name, academic unit, and/or employer will be provided a pseudonym during transcription and on any written documentation or presentation to maintain your anonymity. Only the researchers will have access to your identity. Data collected (e.g. audio and/or video recordings) will be stored on password-protected computers. Once stored data are no longer needed for this study, they will be destroyed.

#### **PARTICIPATION**

Your participation is voluntary, and you may withdraw from the study at any time and for any reason. If you decide not to participate or if you withdraw from the study, there is no penalty or loss of benefits to which you are otherwise entitled. There are no costs to you or any other party.

#### **CONTACT**

Korey Singleton and Dr. Kevin Clark at the College of Education and Human Development at George Mason University are conducting this research. Dr. Clark may be reached at 703-993-3669 for questions or to report a research-related problem. You may contact the George Mason University Office of Research Integrity & Assurance at 703-993-4121 if you have questions or comments regarding your rights as a participant in the

research.

This research has been reviewed according to George Mason University procedures governing your participation in this research.

**CONSENT**

I have read this form and agree to participate in the following activities related to the study:

- ☐ I agree to participate in the focus groups.
- ☐ I do not agree to participate in the focus groups.

---

Signature

Date of Signature

---

## Appendix I

### Step 2 – Delphi Rounds Recruitment Email

Hello,

You have been invited to participate in a study evaluating the development of an online course observation tool, which integrates Universal Design for Learning (UDL) strategies and improves faculty awareness and adoption of UDL strategies. The study is being conducted by Korey Singleton, a PhD candidate from the College of Education and Human Development - Division of Learning Technologies, in cooperation with Dr. Kevin Clark and in fulfillment of the requirements for the doctoral degree. George Mason University's Office of Research Integrity & Assurance has approved this study.

If you agree to participate, you will be asked to complete a series of questionnaires (approximately 3-5 rounds, 1 questionnaire per round every 1-1/2 to 2 weeks) assessing your perspective about the course elements (i.e., course materials, instructional strategies, asynchronous technologies, and synchronous technologies) essential to the development of an online course. We would like to use your first-hand knowledge about online course development, as well as any anecdotal knowledge you may have from your experiences and conversations with others involved in the development of online courses at this university.

Your input will be compiled and analyzed along with that from 20-30 other participants in each round. The results of the analysis from each round will be used as the basis for the development of the questionnaire in each subsequent round. The goal is to achieve consensus among the experts participating in this study as to the essential elements of an online course.

We anticipate no more than 3-5 rounds. We estimate that each questionnaire will take you approximately 15-20 minutes to complete.

Participants who complete a questionnaire in **ALL** of the consensus-building rounds will be entered into a drawing for a brand new *16GB iPad Mini* (1st prize) and a brand new *Livescribe 3 Smart Pen* (2nd prize). ***PLEASE NOTE: There will only be one winner per prize. The winner of the 1st prize is ineligible for the 2nd prize drawing.*** Your participation and the information collected from this questionnaire will be confidential. Research records will be kept confidential, consistent with federal and state regulations. Only the investigators will have access to the data, which will be kept on a password-protected computer.

If you have any questions or concerns about this research study, please contact Korey Singleton, [ksinglet@gmu.edu](mailto:ksinglet@gmu.edu), or Dr. Kevin Clark, [kclark6@gmu.edu](mailto:kclark6@gmu.edu). You may also contact the George Mason University Office of Research Integrity & Assurance at 703-993-4121 if you have questions or comments regarding your rights as a participant in the research.

Thank you for your time and consideration with this matter.

Regards,

Korey Singleton, M.Ed.

Doctoral Candidate, Learning Technologies Design Research  
College of Education and Human Development  
George Mason University

## **Appendix J**

### 6-Week Readiness Checklist Before and After UDL Adaptations

<b>Main Section</b>	<b>Sub-Section</b>	<b>Original Checklist Items</b>	<b>Added/Adapted Checklist Items</b>
<i>Syllabus</i>	Basic Information	Instructor Information (name, contact information -- preferred and alternate)	
		Office Hours (online and/or in person office hours)	
		Basic Course Information (course number/section, title, credit hours)	
		Nature of Course Delivery (asynchronous, synchronous, required face-to-face meetings/exams)	
		Blackboard Login Instructions	
		E-reserve Instructions, if applicable	
	About the Course	Course Description (About the course/subject, prerequisites, etc.)	
		Required Textbooks	
			Information on electronic equivalents is provided for all required textbooks, if available
		Course Learning Objectives/Outcomes	

	Gen Ed Learning Outcomes or Program Learning Outcomes, if applicable
	Technology Requirements
	Identify course activities that go beyond standard online course participation (e.g., field trips, clinical, etc.), if applicable
Course Schedule	Weekly Course Schedule presented in a tabular format (includes units/modules with start-and-end dates, delivery mode if in hybrid course, readings, assignments, due dates, point values)
Assignments and Grading	Assignment Description (Due dates, requirements/expectations, criteria for grading/rubrics, points and/or percentages)
	Identify how assignments connect to course learning objectives
	Grading Scale
	Attendance and Participation Requirements (if applicable)
	Course Policies (late work, make-up exams, extra credit, incompletes, etc.)

		Allow flexibility in submitting assignments electronically (i.e., Bb, e-mail attachment, Dropbox, CD, etc.)
Additional Course Resources	Recommended Course Resources (readings, tutorials, external websites, exhibitions, field trips, multimedia resources, etc.), if applicable	
		Additional course readings, if applicable, offered in multiple formats (e.g., Word, PDF, MP3/audio, etc.)
University Requirements	Academic integrity	
	Disability Accommodations	
	Diversity, Religious Holidays, etc.	
	Student Privacy	
	Student Responsibilities	
	Student Services (Library, Writing Center, Counseling, etc.)	
<i>Course Navigation and Presentation</i>	Learning Management System	Instructor uses Bb, Bb Collaborate, or a similar accessible learning management system to facilitate the course

Homepage	Course has a well-designed landing page (may include course visuals, announcements, to-do list or what's due)	
Announcements	Weekly Announcement has been set up, either on the Home Page or a separate page.	
Course Welcome		Welcome email sent at least once to each student prior to start of course
	Instructor bio, picture, and contact info are present	<del>Instructor bio, picture, and contact info are present</del>
	Includes a warm welcome message to students (audio, video, and/or text-based)	
	Course includes link "Begin Here" or "Start Here", which Includes clear instructions for getting started	
Syllabus	Syllabus can be navigated easily (e.g., consistent use of headers or styles in WORD document, PDF file with bookmarks, etc.)	
	Print version of syllabus available	Syllabus made available in alternative formats (e.g., Word, PDF, posted directly within Bb, etc.)

Weekly Units	Separate units for each week (or a specified time period) with specific dates	
	Units having consistent structure (e.g., introduction to the topic, learning objectives, readings, mini-lectures, labs, assignments including how/where students will participate or submit, discussions, etc.).	
	Links to recorded lectures/presentations are provided and working	
	Link to external websites, e-book, YouTube, etc. are working	
	All links have descriptive text, as opposed to just URL (e.g., link text "Google Search", not <a href="http://www.google.com">http://www.google.com</a> )	
	Includes all graded and non-graded assignments for the week. Graded assignments should include associated grading criteria/rubrics	
	60% of the course content is completed (100% of course to be completed one week before the semester starts)	100% of course to be completed one week before the semester starts

Online Discussions	Discussion/Blog/Journal prompts and descriptions have been created in Blackboard	
		Instructor should model the first online discussions and have examples of exemplary posts for students. Online discussions should also have detailed guidelines and expectations.
		Instructor provided timely individual feedback to all participants, if applicable
Course Tools	Available to students as applicable for the course (e.g., MyGrades, Email, Collaborate, Blog, SafeAssign, etc.)	All unused course tools are hidden (i.e., Only those applicable for the course - e.g., MyGrades, Email, Collaborate, Blog, SafeAssign, etc. – are made available to students)
Student Resources	Includes links to Student Responsibilities and Services modules pages	
	Includes access to Blackboard Help/FAQs	
Tests/Quizzes (if applicable)	Tests/Quizzes are developed in Blackboard with assigned points	

Additional Course Assessments		Offer multiple options for demonstrating knowledge (e.g., submitting multimedia project as opposed to final paper, etc.)	
Accessibility	Audio and Video	All videos are captioned or have transcripts	All videos contain synchronized and accurate closed captions
			Text transcripts are available for each audio or video file
			All media controls keyboard accessible (i.e., can be accessed using the tab key on the keyboard)
	PowerPoint	Accessible PowerPoint slides are available for each lecture/presentation with the videos	All slides contain unique slide titles
			All slide text can be viewed in Outline View
			All images, grouped images, complex images (i.e., charts and graphs), tables, SmartArt graphics, and non-text elements that convey information have meaningful alternative-text descriptions (e.g., immediately after the image, via captions, notes section, etc.)

Word		Instructor-produced tables created using the <b>Insert Table</b> function.
		Slides with audio include text transcript of audio in Notes section
	All Word documents are accessible	All headings have been formatted using Style elements (Heading 1, Heading 2)
		All images, grouped images, complex images (i.e., charts and graphs), tables, SmartArt graphics, and non-text elements that convey information have meaningful alternative-text descriptions (e.g., immediately after the image, via captions, notes section, etc.)
		Simple tables used when appropriate (i.e., one row for column headers and one column for row headers, no merged cells)
		Avoid use of color only to convey meaning (e.g., changing the text color to red to indicate required information. Instructor should write ' <i>required</i> ', use an asterisk, or something similar).

PDF	All PDF documents are text-based and fully accessible	All PDF documents are text-based (i.e., text can be highlighted using a standard mouse cursor), not images. They are also free of handwritten notes, underlines, comments, edits, etc.
Links to External Resources	All publisher-provided resources are accessible, or alternative equivalent resources or strategies are provided	All URLs (including email addresses) link to correct web destinations
		All links have descriptive text, as opposed to just URL (e.g., link text “Google Search”, not <a href="http://www.google.com">http://www.google.com</a> )
		All URLs (including email addresses) are keyboard accessible (i.e., can be accessed by pressing Tab key on keyboard)
Supplemental Applications (Web)		All application (e.g., Skype) controls are keyboard accessible (i.e., can be accessed using the <i>Tab</i> key on the keyboard)?
		Equivalent alternative provided for all web-based supplemental resources used in the course (e.g., MindTap, Pearson MyLabs, McGraw Hill Connect, Prezi, etc.), if applicable

## Appendix K

### DE Course Accessibility Checklist

*Updated Spring 2015*

The following checklist verifies that the instructional documents, audio, and video content used in Mason's distance education courses are in accordance with Section 508 and WCAG 2.0 Level AA accessibility guidelines. While not a comprehensive review of all the areas covered by these guidelines, this checklist does examine areas that would have the most significant impact on the ability of assistive technology users to independently access their instructional materials (e.g., alt text, keyboard navigation, captions, transcripts, etc.).

**PLEASE NOTE:** This is NOT a comprehensive review of the accessibility of the faculty member's course. The reviewers will examine snapshots (i.e., Course readings, LMS layout/structure, 2-3 documents of each type – i.e., Word/PDF/PPT, 2-3 videos, and supplemental applications) of the elements highlighted in the table below and provide feedback/guidance to the instructor on how to correct any accessibility issues that are identified.

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#### Understanding the Review Process

Reviewers examined selected examples of the elements highlighted in the attached checklist (i.e., course readings, LMS layout/structure, 2-3 documents of each type – i.e., Word/PDF/PPT, 2-3 videos, and supplemental applications) and provided feedback and resources for the instructor on how best to remediate any accessibility issues that were identified.

Tools used for testing accessibility:

- Website Accessibility Reviews – [WAVE Toolbar](#)
- MS Office Accessibility Reviews – [Built-in MS Office Accessibility Checker](#)

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**Term:**  
**Professor:**

**Course Evaluated:**  
**Reviewer:**

0.0 – Syllabus and Textbooks/Course Readings (Required and Supplemental)				
ID	Textbooks/Course Readings	Yes	No	N/A
0.1	Is an electronic equivalent provided for all print reading materials?			
0.2	Do all web articles/readings have a PDF/Word version available?			
	Syllabus	Yes	No	N/A
0.3	Course syllabus includes disability statement?			
0.4	Instructor offers multiple formats/options for accessing syllabus?			
Add. Info.	Course Schedule (highlights);			
1.0 – Blackboard Learn Accessibility Checklist				
ID	Course Site Links	Yes	No	N/A
1.1	Do all URLs contain descriptive hyperlinks (i.e., avoid generic phrases like “Click here” and, instead, use phrases that let users know about the content of the linked page prior to selecting it, like ‘ <u>ATI website</u> ’)			
1.2	Are all URLs (including email addresses) keyboard accessible and linked to correct Web destinations?			
1.3	Are all unused buttons and/or tools hidden or removed?			
	Course Site Color	Yes	No	N/A
1.4	Is all of the text easy to read in comparison to the background of the course site (i.e., has a color-contrast ratio of 4.5:1)?			
	Course Site Layout and Formatting	Yes	No	N/A
1.5	Course site uses consistent navigation, tab order, and appropriate language level?			
1.6	Are course elements and controls keyboard accessible?			
1.7	Course site uses header tags to promote easier navigation (e.g., Heading 1, Heading 2)?			

1.8	Quizzes, surveys, tests are designed using Bb’s built-in features?			
1.9	Quizzes, surveys, tests —question types (e.g., multiple choice, short answer, fill-in the blank) are consistent and in proper tab order?			
	<b>Course Tools</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
1.10	Grade Center columns use consistent, coherent reading order?			
1.11*	Instructor uses Bb Collaborate for instruction?			
1.12*	Instructor uses Bb Collaborate for remote office hours?			
1.13*	Instructor uses Virtual Chat for remote office hours?			
Add. Info.	Course Schedule (highlights); Remote Office Hours offered via Skype/email, Multiple strategies for accessing syllabus offered – including condensed version of syllabus (excellent)			
<b>2.0 – Word Accessibility Checklist</b>				
<b>ID</b>	<b>Links</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
2.1	Do all URLs contain descriptive hyperlinks (i.e., avoid generic phrases like “Click here” and, instead, use phrases that let users know about the content of the linked page prior to selecting it, like ‘ <u><b>ATI website</b></u> ’)			
2.2	Are all URLs (including email addresses) keyboard accessible and linked to correct Web destinations?			
	<b>Color</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
2.3	Is all of the text easy to read in comparison to the background of the document (i.e., has a color-contrast ratio of 4.5:1)?			
	<b>Document Layout and Formatting</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
2.4	Has the document been formatted using Style elements (Heading 1, Heading 2)			
	<b>Document Images</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
2.5	Is the document free of background images or watermarks?			
2.6	Do all images, grouped images, complex images (i.e., charts and graphs), tables, and non-text elements that convey information have meaningful			

	alternative-text descriptions (e.g., immediately after the image, via captions, appendix, etc.?)			
	<b>Document Tables</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
2.7	Do the headers consist of only one row?			
2.8	Is the table free of merged cells?			
2.9	If the table spans more than one page, has the header been identified by checking the checkbox (Header row) found in the table properties dialog box.			
2.10	Does the table have a caption to tell the user what information is contained in the table?			
Add. Info.	Captions provided at the beginning of each table. This is fine;			
<b>3.0 – PPT Accessibility Checklist</b>				
<b>ID</b>	<b>Links</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
3.1	Do all URLs contain descriptive hyperlinks (i.e., avoid generic phrases like “Click here” and, instead, use phrases that let users know about the content of the linked page prior to selecting it, like ‘ <u>ATI website</u> ’)			
3.2	Are all URLs (including email addresses) keyboard accessible and linked to correct Web destinations?			
	<b>Color</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
3.3	Is all of the text easy to read in comparison to the background of the document (i.e., has a color-contrast ratio of 4.5:1)?			
	<b>Document Layout and Formatting</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
3.4	Can all slide text be viewed in the Outline View?			
3.5	Is there a unique title for each slide?			
3.6	Do all of the slides avoid using text boxes or graphics with text within them?			
3.7	Is the list style being used as opposed to manually typed characters (e.g. Hyphens, numbers, or graphics)?			
3.8	Is the presentation free of SmartArt?			
	<b>Document Images</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
3.9	Is the document free of background images or watermarks?			

3.10	Are multiple associated images on the same page (e.g., boxes in an organizational chart) grouped as one object?			
3.11	Do all images, grouped images, complex images (i.e., charts and graphs), tables, SmartArt graphics, and non-text elements that convey information have meaningful alternative-text descriptions (e.g., immediately after the image, via captions, appendix, etc.?)			
	<b>Document Tables</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
3.12	Were all tables created using the table option within PPT (as opposed to manual tabs and/or spaces)?			
3.13	Do all tables have a logical reading order from left to right, top to bottom?			
3.14	Do data tables have the entire first row designated as a 'Header Row' in table properties?			
3.15	Are all tables described and labeled (where appropriate)? Note: In some cases, naming/numbering of tables may not be appropriate. For example, a small data table in a presentation may not need a reference.			
3.16	In table properties, is "Allow row to break across pages" unchecked?			
Add. Info.				
<b>4.0 – PDF Accessibility Checklist</b>				
<b>ID</b>	<b>General Layout and Formatting</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
4.1	Can the document text be highlighted using a standard mouse cursor?			
4.2	Is the document free of handwritten notes, underlines, comments, edits, etc.?			
	<b>Form Fields</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
4.3	Have the document properties for Title, Author, Subject (aka Description), Keywords, and Language been filled out?			
4.4	Do all form fields have correct labels and markups: 1. Form fields must have a visual text label next to the form tag and there must be a tool tip. 2. Is the value attribute used on buttons?			

4.5	Are form fields keyboard accessible?			
4.6	Are form fields in correct tab order?			
4.7	Are all multiple-choice answers keyboard accessible and grouped together? 1. The value attribute needs to match the text next to the answer. Make sure the name attribute is the same.			
Add. Info.	Although accessible as is, I would suggest copying (wherever possible) each of the articles into the course. This would eliminate repetitive tasks for downloading and reduce the number of open pages, link clicks, downloads, etc.;			
5.0 – Multimedia File (i.e., audio/video) Accessibility Checklist				
ID	Links	Yes	No	N/A
5.1	Do all URLs contain descriptive hyperlinks (i.e., avoid generic phrases like “Click here” and, instead, use phrases that let users know about the content of the linked page prior to selecting it, like ‘ <u>ATI website</u> ’)			
5.2	Are all URLs (including email addresses) keyboard accessible and linked to correct Web destinations?			
	Captions and Transcripts	Yes	No	N/A
5.3	If a video—Does the video or animation contain synchronized captioning?			
5.3.1	If captioned, are the captions accurate?			
5.4	If an animation—Does the animation have a text equivalent?			
5.5	If a sound file—Does the sound file have a matching transcript file?			
	Functional Controls	Yes	No	N/A
5.6	Does the file have the minimum required media controls of video resizing, volume control, play/stop buttons, and the ability to turn captions on and off?			
5.7	Are all media controls keyboard accessible?			
5.8	Is the media embedded in a way that allows the user to use keyboard controls to move in and out of the video in relation to surrounding content?			

Add. Info.	Some of the videos contained automatic captions and some contained no captions at all; Also, some videos were streamed through YouTube, RealPlayer, etc. Not all players were keyboard accessible and/or contained the all of the relevant controls.			
6.0 – Supplemental Applications (e.g., Pearson, McGraw-Hill, Skype) Accessibility Checklist				
6.1*	Does the course utilize 3 <sup>rd</sup> -party applications like Pearson MyLabs, McGraw-Hill Connect, etc.?			
6.2*	Does the course utilize 3 <sup>rd</sup> -party websites?			
Add. Info.	Skype is used for remote chat; several 3 <sup>rd</sup> -party websites used for assignment rubrics and in several modules			

## **Appendix L**

### **Step 2 – Course Elements by Item #**

<b>Item No.</b>	<b>Course Element</b>
1	Instructor information
2	Office hours
3	Basic Course Information
4	Nature of Course Delivery
5	Blackboard Login Instructions
6	E-reserve Instructions, if applicable
7	Course Description
8	Required Textbooks
9	Information on electronic equivalents is provided for all required textbooks, if available
10	Course Learning Objectives/Outcomes
11	General Education Learning Outcomes OR Program Learning Outcomes, if applicable
12	Technology Requirements for the course
13	Identify course activities that go beyond standard online course participation
14	Weekly Course Schedule presented in a tabular format
15	Assignment Description
16	Identify how assignments connect to course learning objectives
17	Grading scale
18	Attendance and Participation Requirements (if applicable)
19	Course Policies
20	Allow flexibility in submitting assignments electronically
21	Recommended Course Resources

22	Additional course readings, if applicable, offered in multiple formats
23	Academic integrity
24	Disability Accommodations
25	Diversity, Religious Holidays, etc.
26	Student Privacy
27	Student Responsibilities
28	Student Services
29	Instructor uses Blackboard, Blackboard Collaborate, or a comparable accessible learning management system to facilitate delivery of the course
30	Course has a well-designed landing page
31	Weekly Announcement has been set up, either on the Home Page or a separate page
32	Welcome email sent at least once to each student prior to start of course
33	Includes a warm welcome message to students (audio, video, and/or text-based)
34	Course includes link “Begin Here” or “Start Here”, which Includes clear instructions for getting started
35	Syllabus made available in alternative formats
36	Syllabus can be navigated easily (e.g., consistent use of headers or styles in WORD document, PDF file with bookmarks, etc.)
37	Separate units for each week (or a specified time period) with specific dates
38	Units have consistent structure
39	Links to recorded lectures/presentations are provided and working

40	Link to external websites, e-book, YouTube, etc. are provided and working
41	All links have descriptive text as opposed to just URL
42	Includes all graded and non-graded assignments for the week. Graded assignments include associated grading criteria/rubrics
43	Course is 100% complete prior to the start of the semester
44	Discussion/Blog/Journal prompts and descriptions have been created in Blackboard
45	Instructor should model the first online discussions and have examples of exemplary posts for students.
46	Instructor provided timely individual feedback to all participants
47	All unused course tools are hidden
48	Includes links to Student Responsibilities and Services modules pages
49	Includes access to Blackboard Help/FAQs
50	Tests/Quizzes are developed in Blackboard with assigned points
51	Students offered multiple options for demonstrating knowledge
52	All videos contain synchronized and accurate closed captions
53	Text transcripts are available for each audio or video file
54	All video player controls are keyboard accessible
55	All slides contain unique slide titles
56	All slide text can be viewed in <i>Outline View</i>
57	All images, grouped images, complex images (i.e., charts and graphs), tables, SmartArt graphics, and non-text elements that convey information have meaningful alternative-text descriptions (PPT)
58	Instructor-produced tables created using the Insert Table function

59	Slides with audio include text transcript of audio in Notes section
60	All headings have been formatted using <i>Style</i> elements (e.g., Heading 1, Heading 2, etc.)? (WORD)
61	All images, grouped images, complex images (i.e., charts and graphs), tables, SmartArt graphics, and non-text elements that convey information have meaningful alternative-text descriptions? (WORD)
62	Simple tables used when appropriate
63	Avoid use of color only to convey meaning
64	All PDF documents are text-based and free of handwritten notes, underlines, comments, edits, etc.
65	All URLs (including email addresses) link to correct web destinations
66	All links have descriptive text, as opposed to just URL
67	All URLs (including email addresses) are keyboard accessible
68	All application (e.g., Skype) controls are keyboard accessible
69	Equivalent alternative provided for all inaccessible web-based supplemental resources used in the course

## **Appendix M**

### **Step 2 – Delphi Round #1 Questionnaire**

#### ***Instructions for Completing the Questionnaire (Round One)***

You are being asked to complete a series of questionnaires assessing your perspective about the course elements (i.e., course materials, instructional strategies, asynchronous technologies, and synchronous technologies) that are essential to the development of an online course.

Your participation and the information collected from this questionnaire will be anonymous. Your input will be compiled and analyzed along with that from 20-30 other expert panelists in each round (1 questionnaire per round). The results of the analysis from each round will be used as the basis for the development of the questionnaire in each subsequent round (See *Understanding the Delphi Rounds* below). The goal is to achieve consensus among the experts participating in this study as to the essential elements of an online course.

To aid you in completing this questionnaire, focus less on the requirements of your specific online program and more on the course elements that you feel constitute an exemplary online course. More specifically, consider the instructional strategies (e.g., reaching out to each student prior to the start of the course) that have been positively accepted in your online courses and how they could be considered for all online courses.

Please keep in mind that this initial questionnaire is a draft. You are encouraged to comment on the structure of the draft, the checklist items, the sections, etc. If you wish for additional strategies (or changes to existing items) to be considered in the next round's questionnaire, simply list it in the comments section and it will be presented to the group in the next round.

#### ***Response Stem***

Each question will have the following response options: *Unnecessary, Not so important, Desirable, Essential*

Each section will also include an open-ended question to elicit feedback and explanation on anything that you may feel is missing or may need to be edited.

#### ***Understanding the Delphi rounds***

At the conclusion of the first round, descriptive statistics (i.e., mean, standard deviation, and level of agreement) will be calculated for each course element. Consensus will be defined as 75% or more of the panelists rating the course element as either *Desirable/Essential* or *Unnecessary/Not so important*. If more than 75% of panelists rate the course element as *Unnecessary* or *Not so important*, it will be excluded from the next round of questionnaires. Additionally, qualitative data from the open-ended questions will be synthesized and summarized for review by the panelists.

In round 2, panelists will receive the updated questionnaire with the level of agreement (LOA) listed next to each remaining item. They will also receive a feedback report summarizing the quantitative and qualitative findings from the first-round questionnaire. Using the feedback report, the panelists will re-evaluate their initial responses based upon the updated information. After completion of the updated questionnaire, again, descriptive statistics and analysis are repeated to create a second feedback report and 3rd questionnaire. These rounds will repeat until responses from all panelists stabilize. In other words, there are no longer any changes in and/or at least 75% agreement is reached on all items.

### ***Anticipated Time Commitment***

We estimate that each questionnaire will take you approximately 15-20 minutes to complete (1 questionnaire per round every 1-1/2 to 2 weeks, approximately 3-5 rounds total). It is likely, however, that as consensus is reached on certain items, less time would be needed to complete subsequent questionnaires.

### **1. Please enter your participant code:**

## **Syllabus**

**In the following sections, please indicate the degree to which you feel the following course elements are essential when designing the course syllabus:**

### **2. Basic Course Information** – To what extent should the following be included in the course syllabus? Rate each item as *Essential*, *Desirable*, *Not so important*, or *Unnecessary*.

- Instructor information (name, contact information – preferred and alternate)?
- Office hours (online and/or in person office hours)?
- Basic course information (course number/section, title, credit hours)?
- Nature of course delivery (asynchronous, synchronous, required face-to-face meetings/exams)
- Blackboard login instructions

- E-reserve instructions, if applicable
  - Any additional comments about *Basic Course Information*?
3. **About this Course** – To what extent should the following be included in the course syllabus? Rate each item as *Essential*, *Desirable*, *Not so important*, or *Unnecessary*.
- Course description (About the course/subject, prerequisites, etc.)
  - Required textbooks
  - Information on electronic equivalents is provided for all required textbooks, if available
  - Course learning objectives/outcomes
  - General education learning outcomes OR Program learning outcomes, if applicable
  - Technology requirements for the course
  - Identify course activities that go beyond standard online course participation (e.g., field trips, clinical, surveys, etc.), if applicable
  - Any additional comments about *About this Course*?
4. **Course Schedule** – To what extent should the following be included in the course syllabus? Rate each item as *Essential*, *Desirable*, *Not so important*, or *Unnecessary*.
- Weekly Course Schedule presented in a tabular format (includes units/modules with start and end dates, delivery mode if in hybrid course, readings, assignments, due dates, point value)?
  - Any additional comments about *Course Schedule*?
5. **Assignments and Grading** – To what extent should the following be included in the course syllabus? Rate each item as *Essential*, *Desirable*, *Not so important*, or *Unnecessary*.
- Assignment description (Due dates, requirements/expectations, criteria for grading/rubrics, points and/or percentages)
  - Identify how assignments connect to course learning objectives
  - Grading scale
  - Attendance and participation requirements, if applicable
  - Course policies (late work, make-up exams, extra credit, incompletes, etc.)
  - Allow flexibility in submitting assignments electronically (i.e., Bb, email attachment, Dropbox, CD, etc.)
  - Any additional comments about *Assignments and Grading*?
  -
6. **Additional Course Resources** – To what extent should the following be included in the course syllabus? Rate each item as *Essential*, *Desirable*, *Not so important*, or

*Unnecessary.*

- Recommended course resources (readings, tutorials, external websites, exhibitions, field trips, multimedia resources, etc.), if applicable
  - Additional course readings, if applicable, offered in multiple formats (e.g., Word, PDF, MP3/audio, etc.)
  - Any additional comments about *Additional Course Resources*?
7. **University Requirements** – To what extent should the following be included in the course syllabus? Rate each item as *Essential*, *Desirable*, *Not so important*, or *Unnecessary*.
- Academic integrity
  - Disability accommodations
  - Diversity, religious holidays, etc.
  - Student Privacy
  - Student responsibilities
  - Student services (Library, Writing Center, Counseling, etc.)?
  - Any additional comments about *University Requirements*?

### **Course Presentation and Navigation**

**In the following sections, please indicate the degree to which the following course elements are essential in the presentation and navigation of an online course:**

8. **LMS, Course Welcome, and Syllabus** – To what extent should the following be included in the presentation and navigation of the course? Rate each item as *Essential*, *Desirable*, *Not so important*, or *Unnecessary*.
- Instructor uses Blackboard, Blackboard Collaborate, or a comparable accessible learning management system (e.g., Canvas) to facilitate delivery of the course
  - Course has a well-designed landing page (may include course visuals, announcements, to-do list or what's due)
  - Weekly Announcement has been set up, either on the Home Page or a separate page
  - Welcome email sent at least once to each student prior to start of course
  - Includes a warm welcome message to students (audio, video, and/or text-based)
  - Course includes link "Begin Here" or "Start Here", which Includes clear instructions for getting started
  - Syllabus made available in alternative formats (e.g., Word, PDF, posted directly within Bb, etc.)
  - Syllabus can be navigated easily (e.g., consistent use of headers or styles in WORD document, PDF file with bookmarks, etc.)

- Any additional comments about *LMS, Course Welcome, and Syllabus*?
9. **Weekly Modules** – To what extent should the following be included in the presentation and navigation of the course? Rate each item as *Essential, Desirable, Not so important, or Unnecessary*.
- Separate units for each week (or a specified time period) with specific dates
  - Units have consistent structure (e.g., introduction to the topic, learning objectives, readings, mini-lectures, labs, and assignments)
  - Links to recorded lectures/presentations are provided and working (if applicable)
  - Link to external websites, e-book, YouTube, etc. are provided and working (if applicable)
  - All links have descriptive text, as opposed to just URL (e.g., link text “Google Search”, not <http://www.google.com>)
  - Includes all graded and non-graded assignments for the week. Graded assignments include associated grading criteria/rubrics
  - Course is 100% complete prior to the start of the semester (i.e., all modules, assessments, assignments, etc. are complete and potentially available to students on 1st day of class)
  - Any additional comments about *Weekly Modules*?
10. **Discussions, Course Tools, and Student Resources** – To what extent should the following be included in the presentation and navigation of the course? Rate each item as *Essential, Desirable, Not so important, or Unnecessary*.
- Discussion/Blog/Journal prompts and descriptions have been created in Blackboard
  - Instructor should model the first online discussions and have examples of exemplary posts for students
  - Online discussions should also have detailed guidelines and expectations
  - Instructor provided timely individual feedback to all participants, if applicable
  - All unused course tools are hidden (i.e., Only those applicable for the course - e.g., MyGrades, Email, Collaborate, Blog, SafeAssign, etc. – are made available to students)
  - Includes links to Student Responsibilities and Services modules pages
  - Includes access to Blackboard Help/FAQs
  - Any additional comments about *Discussions, Course Tools, and Student Resources*?
  -
11. **Assessments** – To what extent should the following be included in the presentation and navigation of the course? Rate each item as *Essential, Desirable, Not so important, or Unnecessary*.

- Tests/Quizzes are developed in Blackboard with assigned points
- Students offered multiple options for demonstrating knowledge (e.g., submitting multimedia project as opposed to final paper, etc.)
- Any additional comments about *Assessments*?

### **Design of Instructional Materials**

**In the following sections, please indicate the degree to which you feel the following course elements are essential when designing the instructional materials that will be used in the course:**

**12. Audio and Video** – To what extent should the following be included in the design of the instructional materials? Rate each item as *Essential*, *Desirable*, *Not so important*, or *Unnecessary*.

- All videos contain synchronized and accurate closed captions
- Text transcripts are available for each audio or video file
- All video player (e.g., YouTube, Kaltura) controls are keyboard accessible (i.e., can be accessed using the Tab key on the keyboard)
- Any additional comments about *Audio and Video*?

**13. PowerPoint files** – To what extent should the following be included in the design of the instructional materials? Rate each item as *Essential*, *Desirable*, *Not so important*, or *Unnecessary*.

- All slides contain unique slide titles
- All slide text can be viewed in Outline View
- All images, grouped images, complex images (i.e., charts and graphs), tables, SmartArt graphics, and non-text elements that convey information have meaningful alternative text descriptions
- Instructor-produced tables created using the Insert Table function
- Slides with audio include text transcript of audio in Notes section
- Any additional comments about *PowerPoint files*?

**14. Word docs** – To what extent should the following be included in the design of the instructional materials? Rate each item as *Essential*, *Desirable*, *Not so important*, or *Unnecessary*.

- All headings have been formatted using Style elements (e.g., Heading 1, Heading 2, etc.)
- All images, grouped images, complex images (i.e., charts and graphs), tables, SmartArt graphics, and non-text elements that convey information have meaningful alternative text descriptions

- Simple tables used when appropriate (i.e., one row for column headers and one column for row headers, no merged cells)
- Avoid use of color only to convey meaning (e.g., changing the text color to red to indicate required information).
- Instructor writes ‘required’, uses an asterisk, or something similar
- Any additional comments about *Word docs*?

15. **PDF docs** – To what extent should the following be included in the design of the instructional materials? Rate each item as *Essential*, *Desirable*, *Not so important*, or *Unnecessary*.

- All PDF documents are text-based (i.e., can be highlighted using a standard mouse cursor) and free of handwritten notes, underlines, comments, edits, etc.
- Any additional comments about *PDF docs*?

16. **External Resources (3<sup>rd</sup>-party links and applications)** – To what extent should the following be included in the design of the instructional materials? Rate each item as *Essential*, *Desirable*, *Not so important*, or *Unnecessary*.

- All URLs (including email addresses) link to correct web destinations
- All links have descriptive text as opposed to just URL (e.g., link text “Google Search”, not <http://www.google.com>)
- All URLs (including email addresses) are keyboard accessible (i.e., can be accessed by pressing Tab key on keyboard)
- All application (e.g., Skype) controls are keyboard accessible (i.e., can be accessed using the Tab key on the keyboard)
- Equivalent alternative provided for all inaccessible web-based supplemental resources used in the course (e.g., MindTap, Pearson MyLabs, McGraw Hill Connect, Prezi, etc.), if applicable
- Any additional comments about *External Resources*?

## Appendix N

### Step 2 – Delphi Round #2 Questionnaire

#### Getting Started with *Round Two*

In this round, panelists will review the ratings and comments, if any, from the 15 checklist items that **DID NOT** meet the threshold for consensus and/or contained a large enough dispersion in responses that they warrant further review. Panelists are asked to review the feedback from the initial round and reconsider their initial responses to these items. Again, rate each item on a 4pt. Likert Scale ranging from 0 (*Unnecessary*) to 3 (*Essential*). For any 0 (*Unnecessary*) or 1 (*Not so important*) ratings, panelists are asked to submit comments explaining their reasoning.

#### *Anticipated Time Commitment*

We estimate that this questionnaire will take you approximately 10 minutes to complete.

#### 1. Please enter your participant code:

#### Syllabus

There are 7 questions to review in this section (#2 - #8). Please review the ratings and comments from *Round 1* (listed below each question) and re-rate the degree to which you feel the course elements listed below are essential when designing the course syllabus. Rate each item as *Essential*, *Desirable*, *Not so important*, or *Unnecessary*. Please provide a brief explanation in the *Additional Comments* section for any items that you rate *Unnecessary* or *Not so important*. The questions are as follows:

#### 2. Blackboard login instructions (LOA = 77.8%)

Any additional comments about *Bb Login Instructions*?

Checklist Item	Essential	Desirable	Not so important	Unnecessary	Level of Agreement
Blackboard Login Instructions	27.80%	50.00%	16.70%	5.60%	77.80%
<b>Comments:</b> <ul style="list-style-type: none"> <li>• My answer to the question on Bb login reflects the irony that you need to know how to use Bb to get into and use it. How do online students do that without any prior knowledge?</li> <li>• If this were likely a first time course for online students or a basic 100 level course then my desirable would change to essential. Otherwise, links to student support with this information would suffice, which is in the standard Mason requirements.</li> <li>• Blackboard login is essential if using Blackboard, but could make it broader to encompass online courses using other platforms.</li> <li>• Information marked as 'Not so important' is not deemed unimportant, rather this information may be available in other places (such as course schedule, university catalog, information technology services) and duplication of information may result in a mismatch. Linking to the source rather than duplication in a syllabus may help avoid any mismatch. Also, some of these answers depend on whether the syllabus is designed to serve all sections of a course, and it is unclear from this survey. My view comes from one master syllabus serving all sections with supplemental material specific for each section (schedule, instructor info, etc.).</li> </ul>					

**3. Allow flexibility in submitting assignments electronically (i.e., Bb, e-mail attachment, Dropbox, CD, etc.) (LOA = 61.1%)**

Any additional comments about *Flexible Assignment Submission*?

Checklist Item	Essential	Desirable	Not so important	Unnecessary	Level of Agreement
Allow flexibility in submitting assignments electronically (i.e., Bb, e-mail attachment, Dropbox, CD, etc.)?	16.70%	44.40%	27.80%	11.10%	61.10%
<b>Comments:</b> <ul style="list-style-type: none"> <li>I don't personally think that flexibility in submitting assignments is a desirable thing. I'm a fan of consistency in class routines and when students have the option of submitting in multiple ways, it becomes difficult to keep track of where assignments are. Additionally, I prefer to do all of my grading in Bb with rubrics and having students submit outside of Bb makes this more difficult.</li> <li>There are times that mistakes can be made when submitting assignments and once they are submitted there is no way to correct the issue. For example, uploading an assignment to a blog within Bb when it should have been in the discussion board. If the instructor has not enabled the option for the learner to delete their own posts, they are unable to correct the mistake if the instructor will not accept an assignment via other means. Additionally, I have had issues with large files taking a long time to upload or the site being unavailable due to volume (during finals exams).</li> <li>I couldn't tell what "allow flexibility in submitting assignments electronically" meant. Did it mean that professors should be flexible or that they should describe submission requirements? So, my response here is based on a not full understanding of that question.</li> <li>Flexibility in assignments may be on a case-by-case so by having this in the syllabus up front could cause for more work or concern. However, a standard needs to be given so everyone knows what expectations there are.</li> <li>I don't recommend flexibility in submitting course assignments unless there is a technology failure in Blackboard. Students can submit via email or <u>Dropbox</u> at that point, but I don't think that flexibility should be available throughout the course.</li> <li>Flexibility in submitting assignments is desirable, but depends on instructor comfort level. Would also require clear communication path for student to inform instructor that assignment is submitted in alternate way (e.g., posting on Blackboard a link and message that it has been submitted if Blackboard is the central platform for the course).</li> <li>Submission via the LMS is essential for tracking purposes.</li> </ul>					

**4. Recommended Course Resources (readings, tutorials, external websites, exhibitions, field trips, multimedia resources, etc.), if applicable? (LOA = 61.1%)**

Any additional comments about *Recommended Course Resources*?

**5. Additional course readings, if applicable, offered in multiple formats (e.g., Word, PDF, mp3/audio, etc.) (LOA = 61.1%)**

Any additional comments about *Course Readings in Multiple Formats*?

Checklist Item	Essential	Desirable	Not so important	Unnecessary	Level of Agreement
Additional course readings, if applicable, offered in multiple formats (e.g., Word, PDF, MP3/audio, etc.)?	11.10%	50.00%	38.90%	0.00%	61.10%
<b>Comments:</b> <ul style="list-style-type: none"> <li>Additional course readings should be accessible--it would be nice to have them in multiple formats but not essential.</li> <li>Is the course reading question asking: a) if we should specify in the syllabus how the additional course readings are offered? Or b) just that the course readings should be specified in the syllabus? (And the question seems to be assuming that we are offering the course readings in multiple formats?)</li> <li>I often add additional course readings as the course proceeds, which is adaptive to the particular progression of learning in a specific class. Putting it in the syllabus doesn't allow this flexibility with supplemental materials. Putting readings in depends on whether the syllabus is designed to serve all sections of a course, and it is unclear from this survey. My view comes from one master syllabus serving all sections with supplemental material specific for each section (schedule, instructor info, etc.).</li> <li>If resources are going to be used, they should be available in multiple formats.</li> </ul>					

## 6. Resources on diversity and religious holidays (LOA = 72.2%)

Any additional comments about Diversity and Religious Holidays?

Checklist Item	Essential	Desirable	Not so important	Unnecessary	Level of Agreement
Diversity, Religious Holidays, etc.?	44.40%	27.80%	16.70%	11.10%	72.20%
<b>Comments:</b> <ul style="list-style-type: none"> <li>These should not vary from course to course and are university policies so while I often include <u>them</u>, I only see them as important if they vary from the university policy (which they normally shouldn't).</li> <li>I might need more detail on diversity/religious holidays to see if I thought that needed to be included.</li> <li>I know most students don't consult the syllabus for some of these items, but when they need them, the syllabus is the first place they look.</li> <li>These are general university policies for all courses.</li> <li>This info can go on the course site.</li> </ul>					

## 7. Information regarding student privacy (LOA = 72.3%)

Any additional comments about *Student Privacy*?

Checklist Item	Essential	Desirable	Not so important	Unnecessary	Level of Agreement
Student Privacy?	55.60%	16.70%	27.80%	0.00%	72.30%
<b>Comments:</b> <ul style="list-style-type: none"> <li>• I assume Student privacy is a reference to FERPA. I don't think that's necessary.</li> <li>• These should not vary from course to course and are university policies so while I often include them; I only see them as important if they vary from the university policy (which they normally shouldn't).</li> <li>• I know most students don't consult the syllabus for some of these items, but when they need them, the syllabus is the first place they look.</li> <li>• These are general university policies for all courses.</li> <li>• This info can go on the course site.</li> </ul>					

**8. Information on student services (e.g., Library, Writing Center, Counseling Services, etc.) (LOA = 77.8%)**

Any additional comments about *Student Services*?

Checklist Item	Essential	Desirable	Not so important	Unnecessary	Level of Agreement
Student Services (Library, Writing Center, Counseling, etc.)?	55.60%	22.20%	11.10%	11.10%	77.80%
<b>Comments:</b> <ul style="list-style-type: none"> <li>• These should not vary from course to course and are university policies so while I often include them; I only see them as important if they vary from the university policy (which they normally shouldn't).</li> <li>• I know most students don't consult the syllabus for some of these items, but when they need them, the syllabus is the first place they look.</li> <li>• These are general university policies for all courses.</li> <li>• This info can go on the course site.</li> </ul>					

**Course Presentation and Navigation**

There are 6 questions to review in this section (#9 - #14). Please review the ratings and comments from *Round 1* (listed below each question) and re-rate the degree to which you feel the course elements listed below are essential when designing the course syllabus. Rate each item as *Essential*, *Desirable*, *Not so important*, or *Unnecessary*. Please provide

a brief explanation in the *Additional Comments* section for any items that you rate *Unnecessary* or *Not so important*. The questions are as follows:

9. **Welcome email sent at least once to each student prior to the start of the course (LOA = 77.8%)**

Any additional comments about *Welcome Emails*?

Checklist Item	Essential	Desirable	Not so important	Unnecessary	Level of Agreement
Welcome email sent at least once to each student prior to start of course?	55.60%	22.20%	16.70%	5.60%	77.80%
<b>Comments:</b> <ul style="list-style-type: none"> <li>No comments provided</li> </ul>					

10. **Course is 100% complete prior to the start of the semester (i.e., all modules, assessments, assignments, etc., are complete and potentially available to students on 1<sup>st</sup> day of class (LOA = 72.2%))**

Any additional comments about 100% complete course prior to course launch?

Checklist Item	Essential	Desirable	Not so important	Unnecessary	Level of Agreement
Course is 100% complete prior to the start of the semester (i.e., all modules, assessments, assignments, etc. are complete and potentially available to students on 1st day of class)?	22.20%	50.00%	22.20%	5.60%	72.20%
<b>Comments:</b> <ul style="list-style-type: none"> <li>• My response to the completion question is just reality :) Yes all course road maps should be complete prior to day 1. And all supplemental areas of the course should be complete (course resources, assignments, rubrics, assessments links, etc.). And for one's own sanity, the modules should be completed through the end of the semester. BUT in reality things don't always work like that. In face-to-face courses, we are still adjusting our plans right up until the day of a class (depending on new ideas and class discussions, etc.) and I'm not sure it's fair to hold online courses to a different standard. That said, modules should always be ready and open on the timeline you've established and shared with the class (Monday of that week, two weeks before, etc.).</li> <li>• Some of these marked as 'Desirable' or 'Not so important' are marked that way to allow necessary flexibility within the progression of a course.</li> <li>• Courses do not need to be complete unless the future assignments will impact or scaffold.</li> <li>• The 100% ready is problematic if you are teaching for the first time. You can design an entire course, and then start and realize you have to change a lot. Identifying up front what you feel sure about, preparing those items, and then trying out some things the first few weeks, I think can be a better way to go about teaching a course online for the first time. You need to plan for all this time, and time to run the course, but having everything 100% ready is not realistic or even wise.</li> <li>• If a course isn't complete before the semester starts, how can the students get the full support and attention they deserve while the professor is still designing the course?</li> <li>• The goal is to have the course 100% complete, but this is often unrealistic, especially for faculty hired to teach online at the last minute.</li> <li>• You need not have the links to the second half of the course available; to avoid overwhelming students, but the course structure should be set and align with what's in the syllabus.</li> </ul>					

# 11. Discussion/Blog/Journal prompts and descriptions have been created in Blackboard (LOA = 77.3%)

Any additional comments about *Discussions/Blogs/Journals*?

Checklist Item	Essential	Desirable	Not so important	Unnecessary	Level of Agreement
Discussion/Blog/Journal prompts and descriptions have been created in Blackboard?	33.30%	44.00%	11.10%	11.10%	77.30%
<b>Comments:</b> <ul style="list-style-type: none"> <li>Many <u>faculty</u> are moving their discussions to Slack or Piazza rather than Bb. Students often scan material that has too much text, so it's better to provide strategies for writing successful discussions in chunks over time.</li> <li>I am unclear of when it is suggested that 'Discussion/Blog/Journal prompts and descriptions have been created in Blackboard?' is to be created. Some of these marked as 'Desirable' or 'Not so important' are marked that way to allow necessary flexibility within the progression of a course.</li> <li>Or similar platform if not Blackboard.</li> </ul>					

•

**12. Instructor should model the first online discussions and have examples of exemplary posts for students. Online discussions should also have detailed guidelines and expectations (LOA = 72.2%)**

Any additional comments about Instructor Models for Online Discussions?

Checklist Item	Essential	Desirable	Not so important	Unnecessary	Level of Agreement
Instructor should model the first online discussions and have examples of exemplary posts for students. Online discussions should also have detailed guidelines and expectations?	27.80%	44.40%	22.20%	5.60%	72.20%
<b>Comments:</b> <ul style="list-style-type: none"> <li>Online discussions should have detailed guidelines and expectations- ESSENTIAL. The first part about modeling and providing exemplars I think is DESIRABLE. If there is a rubric and the instructor uses the first week to provide feedback to individuals regarding the quality of their posts to improve them as necessary, then I don't think modeling or exemplars are necessary. Now that said, models are sometimes useful, like if creating a Kaltura video as a post or if the directions are different than the norm for a post on a given week.</li> <li>I don't think discussions are necessary for every class. I'm also not convinced that discussions need detailed guidelines and expectations. I think that's a separate issue from modeling. This must be dependent on the demographic of the course, and also the purpose of the discussions.</li> <li>Students often scan material that has too much text, so it's better to provide strategies for writing successful discussions in chunks over time.</li> <li>I am unclear of when it is suggested that 'Discussion/Blog/Journal prompts and descriptions have been created in Blackboard?' is to be created. Some of these marked as 'Desirable' or 'Not so important' are marked that way to allow necessary flexibility within the progression of a course.</li> <li>All LMS communication and collaboration tools need to be explained and support learning objectives. Students are not as savvy as one would expect of grad students.</li> </ul>					

**13. Includes links to Student Responsibilities and Services module pages (LOA = 72.2%)**

Any additional comments about Links to Student Responsibilities and Service modules?

Checklist Item	Essential	Desirable	Not so important	Unnecessary	Level of Agreement
Includes links to Student Responsibilities and Services modules pages?	22.20%	50.00%	16.70%	11.10%	72.20%
<b>Comments:</b> <ul style="list-style-type: none"><li>• The unnecessary information can be searched on Mason's website or Google. It is not essential to provide external or additional links not associated with the actual class.</li><li>• If student responsibilities and expectations are included in the syllabus then linking to these resources is optional.</li></ul>					

**14. Tests/Quizzes are developed in Blackboard with assigned points (LOA = 55.5%)**

Any additional comments about *Assessments*?

Checklist Item	Essential	Desirable	Not so important	Unnecessary	Level of Agreement
Tests/Quizzes are developed in Blackboard with assigned points?	22.20%	33.30%	27.80%	16.70%	55.50%
<b>Comments:</b> <ul style="list-style-type: none"> <li>The question is a little unclear. The can also be developed in Respondus and imported to Blackboard. Yes--they should be assigned points and ultimately placed in Blackboard after they are developed.</li> <li>The tests/quizzes question depends on a course's content. If the content lends itself to recall (the level, I'd say, of most quizzes) then I would find them essential. Otherwise they might be desirable- but depends on the instructor's purpose. Again this is a question bigger than just presentation and navigation of an online course. What are the objectives of a course, of an assignment? Can they be achieved in a variety of ways? So while differentiation within a course is essential, differentiating an actual product might be more desirable than essential. It goes back to the objectives and the purposes of the course AND the needs of the students. And this goes for face-to-face as well as online courses.</li> <li>I don't think it's necessary to give tests and quizzes in BB. They could be delivered through another platform, especially in this age of publisher provided technology. Also, what if the course requires proctored or written exams?</li> <li>"Tests/Quizzes are developed in Blackboard with assigned points" should only be included if this is the best assessment strategy otherwise they should (if used) be administer using the best approach assessing student learning.</li> <li>The test/quiz question begs a bigger question concerning ALL forms of assessment.</li> <li>If tests and quizzes lend themselves to the Blackboard format, then it makes sense as does including assigned points. I would be reticent to require that, though.</li> </ul>					

## Design of Instructional Materials

There are 2 questions to review in this section (#15 - #16). Please review the ratings and comments from *Round 1* (listed below each question) and re-rate the degree to which you feel the course elements listed below are essential when designing the course syllabus. Rate each item as *Essential*, *Desirable*, *Not so important*, or *Unnecessary*. Please provide a brief explanation in the *Additional Comments* section for any items that you rate *Unnecessary* or *Not so important*. The questions are as follows:

### 15. All slides contain unique slide titles (LOA = 77.7%)

Any additional comments about *Unique Titles in PPT*?

Checklist Item	Essential	Desirable	Not so important	Unnecessary	Level of Agreement
All slides contain unique slide titles?	44.40%	33.30%	11.10%	11.10%	77.70%
<b>Comments:</b> <ul style="list-style-type: none"> <li>This section was little tricky for me because I don't use much PowerPoint in my courses and didn't even know it could do some of these things (alt text for example) or that they would be valuable (using insert table function). So my desirable vs. essential distinctions here are almost arbitrary because I don't know the value of some of these features.</li> <li>So, I'm a little lost on this page. I think what I would say is "If PowerPoint slides are provided, they should be accessible" but I don't think it's necessary to provide them if you are using some other form of delivery for content.</li> <li>These features are actually essential to meet the accessibility requirements, but I know faculty will struggle to meet these benchmarks.</li> <li>Note all questions [in this section] desirable because it depends on how these features are handled otherwise. For example, if an accessible outline is already provided for a presentation, there would not necessarily be an essential need for there to be an all-inclusive Outline View or Slide audio included as text in Notes section.</li> </ul>					

# 16. Instructor-produced tables created using the Insert Table function in Word and PPT (LOA = 72.2%)

Any additional comments about *Insert Table in Word and PPT*?

Checklist Item	Essential	Desirable	Not so important	Unnecessary	Level of Agreement
Instructor-produced tables created using the Insert Table function?	11.10%	61.10%	16.70%	11.10%	72.20%
<b>Comments:</b> <ul style="list-style-type: none"> <li>The question about instructor produced tables created using the "insert table" function? I don't know the answer - seems like a trick question.</li> <li>This section was little tricky for me because I don't use much PowerPoint in my courses and didn't even know it could do some of these things (alt text for example) or that they would be valuable (using insert table function). So my desirable vs. essential distinctions here are almost arbitrary because I don't know the value of some of these features.</li> <li>I do not know about the Insert Table function (I believe that may be specific to PowerPoint) rather than slides in general.</li> <li>These features are actually essential to meet the accessibility requirements, but I know faculty will struggle to meet these benchmarks.</li> </ul>					

## Appendix O

### Step 2 – Delphi Round #3 Questionnaire

#### Getting Started with Round Three

The 58 items from the initial 2 rounds fall into 3 separate categories: (1) Items to include in the syllabus of an online course, (2) Items that make up the presentation and navigation of an online course, and (3) Factors to consider in designing the instructional materials for an online course.

In this round, panelists will continue paring down the list by selecting the **10 most important course elements** in each respective category. Each category is then followed up by an open-ended response question asking panelists to briefly explain the reasoning behind their selections. Similar to the instructions provided in the opening round, panelists are encouraged to consider their own beliefs about what is **essential** in the development of an online course, not what is required by their respective institution/college/dept./unit/etc.

***Please Note:** Minor changes were made to language in some of the checklist items. Additionally, some items were switched to other categories so as to eliminate redundancy (e.g., all URLs link to correct web destinations). This was done based upon feedback from multiple panelists and to more broadly reflect the variation in how one develops an online course (see attached **Course Element Classifications - Post Rd 1 & 2 Analysis** doc from your email).*

#### **Anticipated Time Commitment**

We estimate that this questionnaire will take you approximately 15-20 minutes to complete.

#### **1. Please enter your participant code:**

#### **Syllabus**

#### **2. From the list provided below, select the 10 most important items to include in the syllabus for an online course:**

**PLEASE NOTE: Based upon feedback from multiple panelists in Rounds 1 & 2, items marked with an asterisk (\*) were duplicated from the previous section as it was suggested that they may be more appropriately located in the course shell as opposed to the syllabus.**

- Instructor information (name, contact information – preferred and alternate)?
- Office hours (online and/or in person office hours)?
- Basic course information (course number/section, title, credit hours)?
- Nature of course delivery (asynchronous, synchronous, required face-to-face meetings/exams)
- Blackboard login instructions
- E-reserve instructions, if applicable
- Course description (About the course/subject, prerequisites, etc.)
- Required textbooks
- Information on electronic equivalents is provided for all required textbooks, if available
- Course learning objectives/outcomes
- General education learning outcomes OR Program learning outcomes, if applicable
- Technology requirements for the course
- Identify course activities that go beyond standard online course participation (e.g., field trips, clinical, surveys, etc.), if applicable
- Weekly Course Schedule presented in a tabular format (includes units/modules with start and end dates, delivery mode if in hybrid course, readings, assignments, due dates, point value)?
- Assignment description (Due dates, requirements/expectations, criteria for grading/rubrics, points and/or percentages)
- Identify how assignments connect to course learning objectives
- Grading scale
- Attendance and participation requirements, if applicable
- Course policies (late work, make-up exams, extra credit, incompletes, etc.)
- Allow flexibility in submitting assignments electronically (i.e., Bb, email attachment, Dropbox, CD, etc.)
- Assignment description (Due dates, requirements/expectations, criteria for grading/rubrics, points and/or percentages)
- Identify how assignments connect to course learning objectives
- Grading scale
- Attendance and participation requirements, if applicable
- Information on academic integrity (i.e., brief description and/or link provided)\*
- Information on disability accommodations (i.e., brief description and/or link provided)\*
- Information on student responsibilities (i.e., brief description and/or link

provided)\*

- Syllabus can be navigated easily (e.g., consistent use of headers or styles in WORD document, PDF file with bookmarks, etc.)

**3. Please provide a brief explanation for any selections that you did *NOT* include in question #2 (max: 500 chars)...**

- **Course Presentation and Navigation**

**4. From the list provided below, select the 10 most important items to include in the presentation and navigation of an online course:**

**PLEASE NOTE: Based upon feedback from multiple panelists in Rounds 1 & 2, items marked with an asterisk (\*) were duplicated from the previous section as it was suggested that they may be more appropriately located in the course shell as opposed to the syllabus.**

- Instructor uses Blackboard, Blackboard Collaborate, or a comparable accessible learning management system (e.g., Canvas) to facilitate delivery of the course
- Course has a well-designed landing page (may include course visuals, announcements, to-do list or what's due)
- Weekly Announcement has been set up, either on the Home Page or a separate page
- Welcome email sent at least once to each student prior to start of course
- Includes a warm welcome message to students (audio, video, and/or text-based)
- Course includes link "Begin Here" or "Start Here", which Includes clear instructions for getting started
- Syllabus made available in alternative formats (e.g., Word, PDF, posted directly within Bb, etc.)
- Syllabus can be navigated easily (e.g., consistent use of headers or styles in WORD document, PDF file with bookmarks, etc.)
- Separate units for each week (or a specified time period) with specific dates
- Units have consistent structure (e.g., introduction to the topic, learning objectives, readings, mini-lectures, labs, and assignments)
- Links to recorded lectures/presentations are provided and working (if applicable)
- Link to external websites, e-book, YouTube, etc. are provided and working (if applicable)

- All links have descriptive text, as opposed to just URL (e.g., link text “Google Search”, not <http://www.google.com>)
- Includes all graded and non-graded assignments for the week. Graded assignments include associated grading criteria/rubrics
- Course is 100% complete prior to the start of the semester (i.e., all modules, assessments, assignments, etc. are complete and potentially available to students on 1st day of class)
- Discussion/Blog/Journal prompts and descriptions have been created in Blackboard
- Instructor should model the first online discussions and have examples of exemplary posts for students
- Online discussions should also have detailed guidelines and expectations
- Instructor provided timely individual feedback to all participants, if applicable
- All unused course tools are hidden (i.e., Only those applicable for the course - e.g., MyGrades, Email, Collaborate, Blog, SafeAssign, etc. – are made available to students)
- Includes links to Student Responsibilities and Services modules pages
- Includes access to Blackboard Help/FAQs
- Tests/Quizzes are developed in Blackboard with assigned points
- Students offered multiple options for demonstrating knowledge (e.g., submitting multimedia project as opposed to final paper, etc.)
- Information on academic integrity (i.e., brief description and/or link provided)\*
- Information on disability accommodations (i.e., brief description and/or link provided)\*
- Information on student responsibilities (i.e., brief description and/or link provided)\*

**5. Please provide a brief explanation for any selections that you did *NOT* include in question #4 (max: 500 chars)...**

### **Design of Instructional Materials**

**6. From the list provided below, select the 10 most important items to include in designing the instructional materials for an online course:**

- All videos contain synchronized and accurate closed captions
- Text transcripts are available for each audio or video file
- All video player (e.g., YouTube, Kaltura) controls are keyboard accessible (i.e., can be accessed using the Tab key on the keyboard)
- All slides contain unique slide titles
- All slide text can be viewed in Outline View
- All images, grouped images, complex images (i.e., charts and graphs), tables,

SmartArt graphics, and non-text elements that convey information have meaningful alternative text descriptions

- Instructor-produced tables created using the Insert Table function
- Slides with audio include text transcript of audio in Notes section
- All headings have been formatted using Style elements (e.g., Heading 1, Heading 2, etc.)
- All images, grouped images, complex images (i.e., charts and graphs), tables, SmartArt graphics, and non-text elements that convey information have meaningful alternative text descriptions
- Simple tables used when appropriate (i.e., one row for column headers and one column for row headers, no merged cells)
- Avoid use of color only to convey meaning (e.g., changing the text color to red to indicate required information).
- Instructor writes 'required', uses an asterisk, or something similar
- All PDF documents are text-based (i.e., can be highlighted using a standard mouse cursor) and free of handwritten notes, underlines, comments, edits, etc.
- All URLs (including email addresses) link to correct web destinations
- All links have descriptive text as opposed to just URL (e.g., link text "Google Search", not <http://www.google.com>)
- All URLs (including email addresses) are keyboard accessible (i.e., can be accessed by pressing Tab key on keyboard)
- All application (e.g., Skype) controls are keyboard accessible (i.e., can be accessed using the Tab key on the keyboard)
- Equivalent alternative provided for all inaccessible web-based supplemental resources used in the course (e.g., MindTap, Pearson MyLabs, McGraw Hill Connect, Prezi, etc.), if applicable

**7. Please provide a brief explanation for any selections that you did *NOT* include in question #6 (max: 500 chars)...**

## Appendix P

### Step 2 – Delphi Round #4 Questionnaire

#### Completing *Round Four*

Panelists have been provided (via email) with the group's results, their individual selections, and the open-ended response feedback from the other panelists in *Round 3*. Given this information, panelists are again asked to select the **10 most important course elements** in each respective category. Each category is followed up by an optional, open-ended response question. For this final round, panelists should only explain the reasoning behind their choices **IF** they change their original selections.

Again, consensus will be determined by the selection of items that more than 50% of the panelists agree are the most important to include when developing of an online course.

#### Anticipated Time Commitment

We estimate that this questionnaire will take you approximately 10-15 minutes to complete.

#### 17. Please enter your participant code:

#### Syllabus

#### 17. From the list provided below, select the 10 most important items to include in the syllabus for an online course:

**PLEASE NOTE: Based upon feedback from multiple panelists in Rounds 1 & 2, items marked with an asterisk (\*) were duplicated from the previous section as it was suggested that they may be more appropriately located in the course shell as opposed to the syllabus.**

- Instructor information (name, contact information – preferred and alternate)?
- Office hours (online and/or in person office hours)?
- Basic course information (course number/section, title, credit hours)?
- Nature of course delivery (asynchronous, synchronous, required face-to-face meetings/exams)
- Blackboard login instructions

- E-reserve instructions, if applicable
- Course description (About the course/subject, prerequisites, etc.)
- Required textbooks
- Information on electronic equivalents is provided for all required textbooks, if available
- Course learning objectives/outcomes
- General education learning outcomes OR Program learning outcomes, if applicable
- Technology requirements for the course
- Identify course activities that go beyond standard online course participation (e.g., field trips, clinical, surveys, etc.), if applicable
- Weekly Course Schedule presented in a tabular format (includes units/modules with start and end dates, delivery mode if in hybrid course, readings, assignments, due dates, point value)?
- Assignment description (Due dates, requirements/expectations, criteria for grading/rubrics, points and/or percentages)
- Identify how assignments connect to course learning objectives
- Grading scale
- Attendance and participation requirements, if applicable
- Course policies (late work, make-up exams, extra credit, incompletes, etc.)
- Allow flexibility in submitting assignments electronically (i.e., Bb, email attachment, Dropbox, CD, etc.)
- Assignment description (Due dates, requirements/expectations, criteria for grading/rubrics, points and/or percentages)
- Identify how assignments connect to course learning objectives
- Grading scale
- Attendance and participation requirements, if applicable
- Information on academic integrity (i.e., brief description and/or link provided)\*
- Information on disability accommodations (i.e., brief description and/or link provided)\*
- Information on student responsibilities (i.e., brief description and/or link provided)\*
- Syllabus can be navigated easily (e.g., consistent use of headers or styles in WORD document, PDF file with bookmarks, etc.)

**18. Please provide a brief explanation for any selections that you did *NOT* include in question #2 (max: 500 chars)...**

- 
-

## Course Presentation and Navigation

**19. From the list provided below, select the 10 most important items to include in the presentation and navigation of an online course:**

**PLEASE NOTE: Based upon feedback from multiple panelists in Rounds 1 & 2, items marked with an asterisk (\*) were duplicated from the previous section as it was suggested that they may be more appropriately located in the course shell as opposed to the syllabus.**

- Instructor uses Blackboard, Blackboard Collaborate, or a comparable accessible learning management system (e.g., Canvas) to facilitate delivery of the course
- Course has a well-designed landing page (may include course visuals, announcements, to-do list or what's due)
- Weekly Announcement has been set up, either on the Home Page or a separate page
- Welcome email sent at least once to each student prior to start of course
- Includes a warm welcome message to students (audio, video, and/or text-based)
- Course includes link "Begin Here" or "Start Here", which Includes clear instructions for getting started
- Syllabus made available in alternative formats (e.g., Word, PDF, posted directly within Bb, etc.)
- Syllabus can be navigated easily (e.g., consistent use of headers or styles in WORD document, PDF file with bookmarks, etc.)
- Separate units for each week (or a specified time period) with specific dates
- Units have consistent structure (e.g., introduction to the topic, learning objectives, readings, mini-lectures, labs, and assignments)
- Links to recorded lectures/presentations are provided and working (if applicable)
- Link to external websites, e-book, YouTube, etc. are provided and working (if applicable)
- All links have descriptive text, as opposed to just URL (e.g., link text "Google Search", not <http://www.google.com>)
- Includes all graded and non-graded assignments for the week. Graded assignments include associated grading criteria/rubrics
- Course is 100% complete prior to the start of the semester (i.e., all modules, assessments, assignments, etc. are complete and potentially available to students on 1st day of class)
- Discussion/Blog/Journal prompts and descriptions have been created in Blackboard
- Instructor should model the first online discussions and have examples of exemplary posts for students
- Online discussions should also have detailed guidelines and expectations

- Instructor provided timely individual feedback to all participants, if applicable
- All unused course tools are hidden (i.e., Only those applicable for the course - e.g., MyGrades, Email, Collaborate, Blog, SafeAssign, etc. – are made available to students)
- Includes links to Student Responsibilities and Services modules pages
- Includes access to Blackboard Help/FAQs
- Tests/Quizzes are developed in Blackboard with assigned points
- Students offered multiple options for demonstrating knowledge (e.g., submitting multimedia project as opposed to final paper, etc.)
- Information on academic integrity (i.e., brief description and/or link provided)\*
- Information on disability accommodations (i.e., brief description and/or link provided)\*
- Information on student responsibilities (i.e., brief description and/or link provided)\*

**20. Please provide a brief explanation for any selections that you did *NOT* include in question #4 (max: 500 chars)...**

### **Design of Instructional Materials**

**21. From the list provided below, select the 10 most important items to include in designing the instructional materials for an online course:**

- All videos contain synchronized and accurate closed captions
- Text transcripts are available for each audio or video file
- All video player (e.g., YouTube, Kaltura) controls are keyboard accessible (i.e., can be accessed using the Tab key on the keyboard)
- All slides contain unique slide titles
- All slide text can be viewed in Outline View
- All images, grouped images, complex images (i.e., charts and graphs), tables, SmartArt graphics, and non-text elements that convey information have meaningful alternative text descriptions
- Instructor-produced tables created using the Insert Table function
- Slides with audio include text transcript of audio in Notes section
- All headings have been formatted using Style elements (e.g., Heading 1, Heading 2, etc.)
- All images, grouped images, complex images (i.e., charts and graphs), tables, SmartArt graphics, and non-text elements that convey information have meaningful alternative text descriptions
- Simple tables used when appropriate (i.e., one row for column headers and one column for row headers, no merged cells)
- Avoid use of color only to convey meaning (e.g., changing the text color to red to

indicate required information).

- Instructor writes 'required', uses an asterisk, or something similar
- All PDF documents are text-based (i.e., can be highlighted using a standard mouse cursor) and free of handwritten notes, underlines, comments, edits, etc.
- All URLs (including email addresses) link to correct web destinations
- All links have descriptive text as opposed to just URL (e.g., link text "Google Search", not <http://www.google.com>)
- All URLs (including email addresses) are keyboard accessible (i.e., can be accessed by pressing Tab key on keyboard)
- All application (e.g., Skype) controls are keyboard accessible (i.e., can be accessed using the Tab key on the keyboard)
- Equivalent alternative provided for all inaccessible web-based supplemental resources used in the course (e.g., MindTap, Pearson MyLabs, McGraw Hill Connect, Prezi, etc.), if applicable

**22. Please provide a brief explanation for any selections that you did *NOT* include in question #6 (max: 500 chars)...**

**Would you like to share any additional thoughts or comments about the findings or this process?**

## **Appendix Q**

### **Finalized List of Course Elements (100%)**

The list below represents the finalized list of all course elements to be included in the development of an online course (based upon findings from Rounds One and Two). In other words, expert panelists agreed that all of these course elements should be included in an online course when it is launched. The list, including how these elements align with UDL principles, is as follows:

				I	II	III
<b>Main Section</b>	<b>Sub-Section</b>	<b>Item No.</b>	<b>Course Element</b>	<b>Aligns with UDL Principle</b>		
<i>Syllabus</i>	Basic Information	1	Instructor Information (name, contact information -- preferred and alternate)			
		2	Office Hours (online and/or in person office hours)			
		3	Basic Course Information (course number/section, title, credit hours)			
		4	Nature of Course Delivery (asynchronous, synchronous, required face-to-face meetings/exams)			
		6	E-reserve Instructions, if applicable			
	About the Course	7	Course Description (About the course/subject, prerequisites, etc.)			
		8	Required Textbooks			
		9	Information on electronic equivalents is provided for all required textbooks, if available	X		
		10	Course Learning Objectives/Outcomes			

	11	Gen Ed Learning Outcomes or Program Learning Outcomes, if applicable	
	12	Technology Requirements	
	13	Identify course activities that go beyond standard online course participation (e.g., field trips, clinical, etc.), if applicable	X
Course Schedule	14	Weekly Course Schedule presented in a tabular format (includes units/modules with start-and-end dates, delivery mode if in hybrid course, readings, assignments, due dates, point values)	X
Assignments and Grading	15	Assignment Description (Due dates, requirements/expectations, criteria for grading/rubrics, points and/or percentages)	X
	16	Identify how assignments connect to course learning objectives	X
	17	Grading Scale	
	18	Attendance and Participation Requirements (if applicable)	
	19	Course Policies (late work, make-up exams, extra credit, incompletes, etc.)	

University Requirements		23	Academic integrity	
		24	Disability Accommodations	
		27	Student Responsibilities	
<i>Course Navigation and Presentation</i>	Learning Management System	29	Instructor uses Bb, Bb Collaborate, or a similar accessible learning management system to facilitate the course	X
	Homepage	30	Course has a well-designed landing page (may include course visuals, announcements, to-do list or what's due)	X
	Announcements	31	Weekly Announcement has been set up, either on the Home Page or a separate page.	X
	Course Welcome	32	Welcome email sent at least once to each student prior to start of course	X
		33	Includes a warm welcome message to students (audio, video, and/or text-based)	
		34	Course includes link "Begin Here" or "Start Here", which Includes clear instructions for getting started	X

Syllabus	35	Syllabus can be navigated easily (e.g., consistent use of headers or styles in WORD document, PDF file with bookmarks, etc.)	X
	36	Syllabus made available in alternative formats (e.g., Word, PDF, posted directly within Bb, etc.)	X
Weekly Units	37	Separate units for each week (or a specified time period) with specific dates	X
	38	Units having consistent structure (e.g., introduction to the topic, learning objectives, readings, mini-lectures, labs, assignments including how/where students will participate or submit, discussions, etc.).	X
	39	Links to recorded lectures/presentations are provided and working	
	40	Link to external websites, e-book, YouTube, etc. are working	
	41	All links have descriptive text, as opposed to just URL (e.g., link text “Google Search”, not <a href="http://www.google.com">http://www.google.com</a> )	X

		42	Includes all graded and non-graded assignments for the week. Graded assignments should include associated grading criteria/rubrics	
	Online Discussions	46	Instructor provided timely individual feedback to all participants, if applicable	X
	Course Tools	47	All unused course tools are hidden (i.e., Only those applicable for the course - e.g., MyGrades, Email, Collaborate, Blog, SafeAssign, etc. – are made available to students)	X
	Student Resources	49	Includes access to Blackboard Help/FAQs	
	Additional Course Assessments	51	Offer multiple options for demonstrating knowledge (e.g., submitting multimedia project as opposed to final paper, etc.)	X
<i>Accessibility</i>	Audio and Video	52	All videos contain synchronized and accurate closed captions	X
		53	Text transcripts are available for each audio or video file	X
		54	All media controls keyboard accessible (i.e., can be accessed using the tab key on the keyboard)	X

PowerPoint	55	All slides contain unique slide titles	X
	56	All slide text can be viewed in Outline View	X
	57	All images, grouped images, complex images (i.e., charts and graphs), tables, SmartArt graphics, and non-text elements that convey information have meaningful alternative-text descriptions (e.g., immediately after the image, via captions, notes section, etc.)	X
	58	Instructor-produced tables created using the <b>Insert Table</b> function.	X
	59	Slides with audio include text transcript of audio in Notes section	X
Word	60	All headings have been formatted using Style elements (Heading 1, Heading 2)	X
	61	All images, grouped images, complex images (i.e., charts and graphs), tables, SmartArt graphics, and non-text elements that convey information have meaningful alternative-text descriptions (e.g., immediately after the image, via captions, notes section, etc.)	

	62	Simple tables used when appropriate (i.e., one row for column headers and one column for row headers, no merged cells)	X
	63	Avoid use of color only to convey meaning (e.g., changing the text color to red to indicate required information. Instructor should write ‘ <i>required</i> ’, use an asterisk, or something similar).	X
PDF	64	All PDF documents are text-based (i.e., text can be highlighted using a standard mouse cursor), not images. They are also free of handwritten notes, underlines, comments, edits, etc.	X
Links to External Resources	65	All URLs (including email addresses) link to correct web destinations	X
	66	All links have descriptive text, as opposed to just URL (e.g., link text “Google Search”, not <a href="http://www.google.com">http://www.google.com</a> )	X
	67	All URLs (including email addresses) are keyboard accessible (i.e., can be accessed by pressing Tab key on keyboard)	X

Supplemental Applications (Web)	68	All application (e.g., Skype) controls are keyboard accessible (i.e., can be accessed using the <i>Tab</i> key on the keyboard)?	X
	69	Equivalent alternative provided for all web-based supplemental resources used in the course (e.g., MindTap, Pearson MyLabs, McGraw Hill Connect, Prezi, etc.), if applicable	X

## **Appendix R**

### **Finalized List of Course Elements (6-weeks prior to launch)**

The list below represents the finalized list of course elements to be included in the development of an online course 6-weeks prior to its launch (based upon findings from Rounds Three and Four). This list represents the minimum course elements to be included at this time and provides a baseline for gauging a faculty member's progression through the development on their online course. The list, including how these elements align with UDL principles, is as follows:

				I	II	III
Main Section	Sub-Section	Item No.	Course Element	Aligns with UDL Principle		
<i>Syllabus</i>	Basic Information	1	Instructor Information (name, contact information -- preferred and alternate)			
		3	Basic Course Information (course number/section, title, credit hours)			
		4	Nature of Course Delivery (asynchronous, synchronous, required face-to-face meetings/exams)			
	About the Course	7	Course Description (About the course/subject, prerequisites, etc.)			
		8	Required Textbooks			
		10	Course Learning Objectives/Outcomes			
		12	Technology Requirements			
	Course Schedule	14	Weekly Course Schedule presented in a tabular format (includes units/modules with start- and-end dates, delivery mode if in hybrid course, readings, assignments, due dates, point values)			X

	Assignments and Grading	15	Assignment Description (Due dates, requirements/expectations, criteria for grading/rubrics, points and/or percentages)	X
		17	Grading Scale	
		18	Attendance and Participation Requirements (if applicable)	
<i>Course Navigation and Presentation</i>	Learning Management System	29	Instructor uses Bb, Bb Collaborate, or a similar accessible learning management system to facilitate the course	X
	Homepage	30	Course has a well-designed landing page (may include course visuals, announcements, to-do list or what's due)	X
	Announcements	31	Weekly Announcement has been set up, either on the Home Page or a separate page.	X
	Course Welcome	32	Welcome email sent at least once to each student prior to start of course	X
		34	Course includes link "Begin Here" or "Start Here", which Includes clear instructions for getting started	X

Syllabus		35	Syllabus can be navigated easily (e.g., consistent use of headers or styles in WORD document, PDF file with bookmarks, etc.)	X
Weekly Units		37	Separate units for each week (or a specified time period) with specific dates	X
		38	Units having consistent structure (e.g., introduction to the topic, learning objectives, readings, mini-lectures, labs, assignments including how/where students will participate or submit, discussions, etc.).	X
		39	Links to recorded lectures/presentations are provided and working	
Course Tools		47	All unused course tools are hidden (i.e., Only those applicable for the course - e.g., MyGrades, Email, Collaborate, Blog, SafeAssign, etc. – are made available to students)	X
<i>Accessibility</i>	Audio and Video	52	All videos contain synchronized and accurate closed captions	X
		53	Text transcripts are available for each audio or video file	X

	54	All media controls keyboard accessible (i.e., can be accessed using the tab key on the keyboard)	X
Word	60	All headings have been formatted using Style elements (Heading 1, Heading 2)	X
	61	All images, grouped images, complex images (i.e., charts and graphs), tables, SmartArt graphics, and non-text elements that convey information have meaningful alternative-text descriptions (e.g., immediately after the image, via captions, notes section, etc.)	
	63	Avoid use of color only to convey meaning (e.g., changing the text color to red to indicate required information. Instructor should write ‘ <i>required</i> ’, use an asterisk, or something similar).	X
PDF	64	All PDF documents are text-based (i.e., text can be highlighted using a standard mouse cursor), not images. They are also free of handwritten notes, underlines, comments, edits, etc.	X
Links to External Resources	65	All URLs (including email addresses) link to correct web destinations	X

	66	All links have descriptive text, as opposed to just URL (e.g., link text “Google Search”, not <a href="http://www.google.com">http://www.google.com</a> )	X
	67	All URLs (including email addresses) are keyboard accessible (i.e., can be accessed by pressing Tab key on keyboard)	X
Supplemental Applications (Web)	69	Equivalent alternative provided for all web-based supplemental resources used in the course (e.g., MindTap, Pearson MyLabs, McGraw Hill Connect, Prezi, etc.), if applicable	X

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## **Biography**

Korey J. Singleton graduated from Oakland Mills High School (Columbia, Maryland) in 1991. He received his Bachelor of Science degree in Biomedical Engineering from Northwestern University in 1995. He worked for 2-1/2 years as a Rehabilitation Engineer with the University of Illinois at Chicago's Assistive Technology Unit. Subsequent to that, Korey moved back to the Washington, DC Metropolitan-area to take a position at the Department for the Blind and Vision Impaired, Fairfax, Virginia (DBVI), to work as an Assistive Technology Specialist/Rehabilitation Engineer. He was employed for 8 years with DBVI, during which time he completed his Master of Education in Curriculum & Instruction at George Mason University. He is currently employed as the Assistive Technology Initiative (ATI) Manager for George Mason University (GMU) and has been in this role for the past 8-1/2 years. The ATI operates under Mason's Compliance, Diversity, and Ethics Office and is charged with guiding and implementing a university-wide strategy for addressing the electronic and information technology accessibility needs of students, staff, and faculty members with disabilities. For over 20 years now, Korey has worked to support the use of assistive technology by individuals with disabilities at home, at work, and in the classroom. He has also been a staunch advocate for electronic and information technology accessibility in the workplace and in the classroom. While he loves his work, it is the people that the work has afforded him the opportunity to meet which has brought him the most satisfaction.

On a personal note, Korey and his wife of 7-1/2 years, Ericka, have two healthy, loud, and bouncing boys, Xavier and Tristan, and 2 devoted "man's best friends", Miles and Bru. They reside in Loudoun County, Virginia.