WALKING THE WALK OR JUST ALL TALK? COLLEGE FACULTY AND STUDENTS' PERCEPTIONS OF UNIVERSAL DESIGN FOR LEARNING IN THE CLASSROOM

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ABSTRACT
Universal Design (UD) is an effective, flexible blueprint that focuses on differences as they relate to learning; because learners differ in the ways they see and understand information that is presented to them, students from various socio-economic, cultural, and learning differences need different ways of approaching content. Extant research has largely explored attitudes related to UD from a faculty or student perspective, this exploratory case study employs quantitative research methods to explore perceptions of UD among faculty and the students they teach at a mid-sized regional public university.
Using a quantitative, causal comparative framework, findings indicate student *and* faculty agreement with statements about the importance of UD strategies/practices is overwhelmingly higher than respondents' agreement with statements about the implementation of those strategies/practices in their classrooms. This difference was statistically significant across all items for students; faculty perceived the gap to be a lot more narrow.
Findings highlight the challenges that still face faculty and students, and the academy. Benefits to students of expanded professional development opportunities for faculty to support the changing needs of diverse learners are identified, and practical UD applications in the college-classroom are presented.
Keywords: Universal design, universal design for assessment, universal design for learning, universal design for instruction, students with disabilities, professional development, disability in higher education, scholarship of teaching and learning.

INTRODUCTION

Student success depends on increasingly sophisticated teaching and learning skills to meet a rapidly changing student body. Universal Design (UD) is an effective, flexible blueprint based on neuroscience that focuses on differences as they relate to learning (CAST, 2014). Student success depends on increasingly sophisticated teaching and learning skills and UD creates decentralized practices, resulting in new contexts and styles of instruction that can be valuable for all students, particularly those with disabilities.

In recent years, students with disabilities have emerged as a growing higher education sub-group in both the United States of America and overseas (A. Lombardi, Vukovic, & Sala-Bars, 2015). The U.S. Department of Education National Center for Education Statistics found that 2,563,000 million undergraduate students (11.1 per cent) in the 2011–12 time period reported having a disability (Snyder, de Brey, & Dillow, 2016). Data also indicates that virtually all public 2-year and 4-year institutions reported enrolling students with disabilities; the majority of whom reported having specific learning disabilities (31 per cent), attention deficit hyperactivity disorder (18 percent), mental health/psychological disabilities (15 percent), health impairments/conditions (11 percent), and mobility/orthopedic impairments (7 percent).

Students with disabilities are protected by state, federal, and local laws prohibiting discrimination and requiring equal levels of access to academic services, environments, and resources. One key piece of legislation that provides disabled students with equal benefits, services, and opportunities is Section 504 of the Rehabilitation Act of 1973 which states that "no qualified individual with a disability in the United States shall be excluded from, denied the benefits of, or be subjected to discrimination under any program or activity that receives federal financial service." (R. Act, 1973). Another important piece of legislation that applies to students with

disabilities is The Americans with Disabilities Act, which defines an individual with a disability as a person with a physical or mental impairment that substantially limits one or more major life activities, a person who has a history or record of such impairment, or a person perceived by others as having such impairment. The Act prohibits discrimination on the basis of disabilities in employment, public services, privately operated public accommodations, services, and telecommunications (D. Act, 2008). Both of these legislative provisions guarantee accommodations to students who self identify with verified disabilities. The most common accommodations that are provided in a post-secondary context include: additional exam time, classroom note-takers, faculty-provided written course notes or assignments, help with learning strategies or study skills, and alternative exam formats (Raue & Lewis, 2011).

However, despite robust legislation aimed at supporting and protecting students with disabilities, barriers do hinder implementation of UD in the post-secondary environment. For students, research indicates that many lack necessary knowledge (and self-advocacy) to attain accommodations they are entitled to (Fleming, Plotner, & Oertle, 2017); for faculty, negative attitudes and misconceptions are often coupled with limited staff resources to provide faculty and staff training on accessibility issues (Raue & Lewis, 2011). This is problematic given that research indicates that students with disabilities are more likely to achieve their full educational potential when both students and faculty are well-informed about disabilities and the positive impact of appropriate accommodations (Leyser, Vogel, Wyland, & Brulle, 1998).

In the next section of this paper, a review of literature defines and examines universal design in the context of learning, and explores faculty and student attitudes toward disability in a college classroom context. Next, the researchers outline the survey methodology employed, describe results, discuss implications of the findings, and outline practical UD strategies that can be utilized in the college classroom.

LITERATURE REVIEW

Universal Design

Universal design (UD) is a framework that was originally derived in the 1950s by architectural and environmental designers eager to create opportunities for enhanced access for individuals with disabilities (M. King-Sears, 2009; A. R. Lombardi, Murray, & Gerdes, 2011; Roberts, Park, Brown, & Cook, 2011). The concept of UD evolved further in the 1970s, heavily influenced by legislation mandating civil rights for individuals with disabilities, and ultimately evolved into an effort to make postsecondary education more accessible to students with disabilities through curriculum development. The major frameworks of UD intend to provide flexibility and support to the greatest number of learners via a proactive approach to instruction design (P. King-Sears, 2014). This application of the basic concepts of UD - integration and accessibility - to all people in all environments ultimately evolved into a number of interchangeable perspectives (and acronyms), including: Universal Design for Assessment (*UDA*) (Ketterlin-Geller, 2005); Universal Design for Instruction (*UDI*) (Scott, Mcguire, & Shaw, 2003); and Universal Design for Learning (*UDL*) (A. R. Lombardi, et al., 2011; Orr & Hammig, 2009).

While the underlying principles of each framework may vary, UDA, UDI and UDL share five common themes: (1) *backward design* or the formulation of learning goals and objectives that are stated clearly from the beginning (e.g., on the course syllabus) and mapped to all course assignments and requirements; (2) *multiple means of presentation*, or flexibly presenting content (e.g., providing course materials in digital and print formats) to reduce instructional barriers; (3) *inclusive teaching strategies and learner supports* or specific lecture strategies that aid comprehension (e.g., summarizing key points periodically) and other classroom strategies (e.g., small group work, scaffolding); (4) *inclusive assessment* or varied assessment techniques that are closely mapped to course objectives, and allow students to use combinations of writing, speaking, and other activities to demonstrate mastery of knowledge; and (5) *instructor approachability and empathy* or allowing multiple options for engagement and, if necessary, helping students seek out additional resources available on campus (A. R. Lombardi, et al., 2011; Orr & Hammig, 2009).

Universal Design (UD) frameworks seek opportunities to improve and optimize teaching and learning for all people, to promote maximum usability and accessibility in the planning, delivery, and evaluation stages of instruction (A. R. Lombardi, et al., 2011). UD research focuses on the disconnect between an increasingly diverse student population and a “one-size-fits-all” curriculum which creates barriers to desired gains in academic achievement (Rose & Meyer, 2002), which according to Edyburn (2005), effectively focuses research, development, and educational practice on understanding accessibility and diversity. According to Dinmore (2014), the framework also has the potential to boost teacher-student interaction, increase retention and engagement, and potentially removes roadblocks to learning for all students.

Disability: Student Attitudes and Challenges

Federal data indicates that only a third of students with disabilities who enroll in four-year programs graduate within eight years; that number is as high as 41 per cent in two-year schools (Newman, et al., 2011). When compared with the mainstream cohort, students with disabilities are also at higher risk of poor academic performance, and early departure from college; they also demonstrate higher levels of emotional or psychological distress (Smedema & Tansey, 2015).

Unlike their experiences at secondary level, students with disabilities are required to self-identify to the college/university in order to access accommodations and supports. Newman, Wagner, Cameto, and Knokey (2009) found that only about 40 per cent of college students who received special education services seek accommodations in higher education.

Students decide for varying reasons not to self-disclose (Getzel & Thoma, 2008). Hart, Grigal, and Weir (2010) argue that many are poorly equipped to request and negotiate accommodations at the postsecondary level due to a lack of opportunity to practice these self-advocacy skills in high school where services were often automatically provided; students with disabilities also resist requesting accommodations due to poor societal perceptions of people with disabilities (May & Stone, 2010); Denhart argues students feel that they are cheating by requesting accommodations, while Smart (2001) suggest they may fear the stigma associated with their disability. This issue is exacerbated if the disability is not visible – as in the case of psychological or psychiatric disabilities such as anxiety or depression. These reasons, according to Barnard-Brak et al (2010), are among a myriad of reasons why college students with disabilities don't receive the accommodations they are legally entitled to.

Factors that can have a positive impact on student outcomes are linked to levels of student understanding of the disability, how it impacts their academic performance (self-awareness), and knowledge of how to request accommodations (self-advocacy) (Fleming, et al., 2017). In addition, seeking disability support services, forming relationships with faculty and instructors, developing an on-campus support system, and gaining awareness and self-understanding of needs have also been linked to student needs being met in a college environment (Getzel & Thoma, 2008). College students with disabilities report feeling most successful when faculty set clear, consistent expectations, and content that is delivered clearly and at an understandable level. Students also reported benefiting from outlines of notes, pause and question procedures during lectures, reading guides, and study guides (Madaus, Scott, & McGuire, 2003). Inclusive instruction, which provides a more holistic approach to the design of materials and instructional methods, also has the potential to reduce barriers, and increase student participation and success without extensive accommodations (Gawronski, Kuk, & Lombardi, 2016) (Rose, Meyer, & Hitchcock, 2005) (CAST, 2018). Hall, Strangman, and Meyer (2003) encourage the use of digital materials, which they argue are inherently flexible and customizable to individual student needs.

Disability: Faculty Attitudes and Challenges

Without doubt, the growing population of students requesting accommodations creates challenges for college faculty and their students (Jensen, McCrary, Krampe, & Cooper, 2004). An essential element of student persistence in college is the ability to develop meaningful student-faculty relationships (Astin, 1993; Tinto, 1993). Research indicates that, for the most part, faculty members are willing to provide accommodations for students with learning disabilities (Leyser, et al., 1998), but are challenged by perceptions that accommodations impact the academic integrity of courses, programs, and the institution (Bourke, Strehorn, & Silver, 2000).

LaRocco and Wilken (2013) found that while faculty members acknowledge the challenges faced by students with disabilities in the college/university setting, they were focused more on how pedagogical changes would affect them personally (i.e., requirements concerning effort, time commitment, and skill development) and a strong desire by faculty to maintain a long-standing status quo (Pliner & Johnson, 2004). Fichten, Goodrick, Tagalakis, and Amsel (1990) found that professors prefer students who approach them and initiate dialogue, but that students frequently only approach professors for assistance as a last resort.

Other research found that faculty overwhelmingly reported that they did not implement inclusive instruction in their classes, most likely due to a lack of relevant campus-wide professional development initiatives to provide faculty with training or information about UD (LaRocco & Wilken, 2013). Professional development is proven to be most effective, according to Knowles, Holton III, and Swanson (2011), when it is focused on curricular and instructional strategies that are needed to teach all students. While faculty positively endorse aspects of inclusive instruction, many are not implementing related strategies in the classroom; faculty reported being unaware that students with disabilities are even enrolled in their classes, and many receive virtually no training

in practices that would benefit students with disabilities (Gawronski, et al., 2016; A. Lombardi, et al., 2015; A. R. Lombardi, et al., 2011). Research indicates that faculty lack experience teaching students with disabilities, are unfamiliar with disability rights laws and campus services for students with disabilities, and how to properly implement accommodations (Baggett, 1994; Cawthon & Cole, 2010; Thompson, Bethea, & Turner, 1997). Female faculty were more likely than their male counterparts to accommodate students with disabilities, and tenure-track faculty appeared to be less accommodating and less willing than non-tenure-track faculty (A. R. Lombardi, et al. (2011). Gawronski, et al. (2016) found that age and ethnicity did not make a significant difference in predicting faculty attitudes toward inclusive instruction.

Vega and Tayler (2005) argue that the role of faculty has shifted, that they are no longer merely responsible for ensuring a student learns the material; rather, their role is to facilitate students' interpretation of the information. Pliner and Johnson (2004) argue the UD framework encourages faculty to think more broadly about "what they teach; why they teach it; and, why and how they assess student learning" (p. 107).

College faculty and students are undoubtedly operating in more competitive and dynamic environments than ever before; it is therefore critical to identify and eliminate potential barriers to learning and student success, particularly those with disabilities. Expanding knowledge of both groups' perceptions of UD strategies in the classroom will potentially benefit all parties. Extant research has largely explored attitudes toward UD from either a faculty *or* student perspective, this exploratory case study employs quantitative research methods to explore perceptions of UD among faculty and students they are currently teaching.

RESEARCH QUESTIONS

RQ1.

(a) What are faculty attitudes toward with UD principles and practices in the classroom?
(b) What are faculty actions regarding UD principles and practices in the classroom?
(c) Is there a difference between faculty attitudes and actions regarding UD principles and practices in the classroom?

RQ2.

(a) What are students' attitudes toward UD principles and practices in the classroom?
(b) What are students' perceptions of faculty actions regarding UD principles and practices in the classroom?
(c) Is there a difference between students' attitudes and their perceptions of faculty actions regarding UD principles and practices in the classroom?

RQ3.

(a) Is there a difference between faculty and students' attitudes toward UD principles and practices in the classroom?
(b) Is there a difference between faculty and students' perception of faculty actions regarding UD principles and practices in the classroom?

METHODOLOGY

Survey Instrument

The survey instrument used in this study has preliminary convergent validity because it uses many of the same constructs presented in an Inclusive Teaching Strategies Inventory (ITSI) self-report survey that measures respondent attitudes and actions with regard to academic accommodations and inclusive learning environments (Gawronski, et al., 2016; A. R. Lombardi, et al., 2011). Gawronski, et al. (2016) and A. R. Lombardi, et al. (2011) assert that the ITSI is the only survey known to incorporate principles from the major UD frameworks.

One questionnaire was sent to faculty (ITSI), another adapted student version (ITSI-S) was sent to students. The validity of the attitude subscales is confirmed in A. R. Lombardi, et al. (2011). The inventory measures six constructs regarding inclusive instructional practices based on the tenets of Universal Design across several frameworks. The constructs are: (i) Accommodations, (ii) Accessible Course Materials, (iii) Course Modifications, (iv) Inclusive Lecture Strategies, (v) Inclusive Classroom, and (vi) Inclusive Assessment (A. R. Lombardi, et al., 2011). For the current study, the ITSI and ITSI-S instruments were abbreviated from 31 questions to 18 to maximize completion likelihood; the Cronbach's α score for the instrument used in this study was >0.9, which demonstrates acceptable internal reliability.

IRB approval was secured prior to administering the survey; the questionnaire was pre-tested with a small sample of faculty and students to verify the categorical representation, and assess validity and comprehension. All students and faculty in the Communication Studies Department at a mid-sized, public Northeastern regional university were invited to participate in the survey.

The surveys were each comprised of four sections. The first gathered relevant demographic data from both groups of respondents, the second and third sections asked both respondent groups (faculty and students) to indicate agreement or disagreement to statements adapted from the aforementioned ITSI(S) inventory using a 6-point Likert scale; 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree, 6= Don't Know.

As previously mentioned, the current study used an adapted version of a previous study by A. R. Lombardi, et al. (2011) utilizing the same subscales with fewer questions. The first subscale, *Multiple Means of Presentation*, contained items related to presentation of course content with a particular emphasis on flexibility, use of technology, and various instructional formats (e.g., small group work, peer-assisted learning, and hand-on activities). The second subscale, *Inclusive Lecture Strategies*, contains items that measure teaching strategies specific to a typical postsecondary lecture-style class format, including simple strategies faculty may use to assess student comprehension such as repeating student questions to the class before answering and periodically summarizing key points throughout the lecture. The third subscale, *Accommodations*, contains items relevant to specific accommodation requests from students. The fourth subscale, *Campus Resources*, contains items relevant to awareness and use of the Disability Services office personnel and distributed resources (e.g., website and e-newsletters). The fifth subscale, *Inclusive Assessment*, includes items pertaining to flexible response options on exams, nontraditional exams, and flexibility with deadlines. Finally, the sixth subscale, *Accessible Course Materials*, includes items pertaining to the use of a course website and submission of course assignments through online formats.

The final section of the survey asked respondents to answer one open-ended question seeking additional insights not covered in the survey. The convenience nature of the survey and small sample sizes mean that external validity for the survey is low; therefore, only face validity can be assumed.

Participants

In April of the spring 2017 semester, a *Qualtrics* survey link was circulated via email to all Communication Studies students and faculty at a mid-sized, public Northeastern regional university (faculty n=35; student n=473). An initial solicitation email with web-link to the survey was distributed, and one reminder email yielded 76 completed student surveys (n=76; response rate = 16 per cent) and 21 faculty surveys (n=21; response rate = 60 per cent).

Operationalization of the survey

Faculty:

Faculty respondents were first asked a series of demographic questions related to gender, age, race, level of education, rank, teaching experience, type of classes taught (face-to-face/online). In the next section of the survey, faculty were asked to indicate agreement/disagreement with a series of statements related to attitudes toward various UD accommodations/strategies. Items were measured on a 6-point scale preceded by the statement: The following statements explore your attitudes toward various UD accommodations/strategies. Please rate the following statements: "*I believe it's important to...*"

In the next section, faculty were asked to indicate agreement/disagreement with a series of statements related to UD accommodations/strategies they implement in the classroom. Items were measured on a 6-point scale preceded by the statement: The following statements explore the UD accommodations/strategies you implement in the classroom. Please rate the following statements: "*As an Instructor, I...*"

Students:

Student respondents answered questions related to gender, age, race, class year, if they have a disability (and if they indicate they do – if they registered with the university's Office of Disability Services and the nature of the disability). In the next section of the survey, students were asked to indicate agreement/disagreement with a series of statements related to attitudes toward various UD accommodations/strategies. Items were measured on a 6-point scale preceded by the statement: The following statements explore your attitudes toward various UD accommodations/strategies. Please rate the following statements: "*I believe it's important to...*"

In the next section, students were asked to indicate agreement/disagreement with a series of statements related to UD accommodations/strategies their COMM instructors implement in the classroom. Items were measured on a 6-point scale preceded by the statement: The following statements explore the UD accommodations/strategies your Instructors typically implement in the classroom. Please rate the following statements about faculty action in the classroom: "*My Communication Studies Instructor(s) do...*"

Data Analysis
Data were analyzed using IBM SPSS 24 for Windows. A $p \leq 0.05$ significance level was used for all statistical tests. A series of non-parametric Wilcoxon signed ranks test and Mann-Whitney U-tests were conducted to inform research questions.

FINDINGS AND ANALYSIS

Description Of Respondents

Faculty
Of the 21 respondents participating in the study, 62 per cent (n = 13) were female and 39 per cent (n = 8) were male. The median age of student respondents was 48 old. The majority of faculty are Caucasian, (85 per cent; N=41), and have a master's (52 per cent; N = 11) or doctoral degree (48 per cent; N = 10). With regard to teaching experience, 33 per cent (n = 7) are tenure-track assistant professors, 33 per cent are part-time instructors (n = 7), 3 per cent are full-time instructors (n = 3), and 4 per cent are either associate (n = 2) or full professors (n = 2). The median amount of teaching experience was 10 years. The majority of faculty respondents teach three face-to-face classes per semester, (38 per cent; N=8), 33 per cent teach two classes (n=41), 24 per cent teach four classes (n=5). Twenty-nine per cent of faculty teach two online classes, (n=6), 33 per cent teach two online classes (n=41), 48 per cent do not teach online classes (n=10). Statistical analysis indicated an absence of statistically significant differences between the two respondent groups in relation to demographic items.

Students
Of the 76 respondents participating in the study, 83 per cent (n = 63) were female and 17 per cent (n = 13) were male. The median age of student respondents was 21 years old. The majority of students are Caucasian, (78 per cent; n=60), and juniors (41 per cent; n = 31) or seniors (40 per cent; n = 30). Eighty-four per cent indicated that they do not have a disability (n = 64); of the 16 per cent (n= 12) who indicated they do, 44 per cent (n=7) have registered with the university's office of disability services. The majority (25 per cent) of students indicated that they have a learning disability (n=5, 25 per cent), psychiatric disorders (n=4, 25 per cent), or Attention Deficit Hyperactivity Disorder (n=4, 20 per cent). The remaining students indicated other disability types, including physical (n=3, 15 per cent).

RQ 1: What are *faculty* attitudes toward UD and the implementation of UD principles and practices in the classroom? Is there a statistically significant difference in *faculty* attitudes toward UD and the implementation of principles and practices in their classrooms?
Faculty agreement to statements about the importance of UD was higher than their agreement with statements about their implementation of the items in their classrooms for all but one of the items - *allow flexibility with assignment deadlines in my course(s) for ANY student who expresses a need* (faculty attitude mean=3.38, faculty action mean=3.57, difference in means=-0.19). See Table 1.

Table 1: Faculty Attitude and Implementation

	Faculty Attitude Mean	Faculty Action Mean	Difference in Means	Wilcoxon Z score	P value
Allow students to express comprehension in multiple ways.	4.62	4.57	0.05	-0.577	0.564
Allow students to demonstrate their knowledge and skills in ways other than traditional tests and exams (e.g. written essays, portfolios, journals).	4.62	4.52	0.1	-0.632	0.527
Allow flexibility with assignment deadlines in my course(s) for ANY student who expresses a need.	3.38	3.57	-0.19	-1.134	0.257
Allow flexible response options on exams (e.g., change from written to oral) for ANY student who expresses a need.	3.71	3.48	0.23	-0.676	0.499
Post electronic versions of course handouts.	4.86	4.71	0.15	-0.905	0.366
Use a course website (e.g. Blackboard or faculty web page).	4.86	4.71	0.15	-0.707	0.480

Post lecture notes online (on Blackboard or another website) for ALL students.	3.71	3.43	0.28	-1.403	0.161
Allow students flexibility in how they submit assignments electronically (e.g. mail attachment, digital drop box).	2.76	2.76	0.0	-1.175	0.861
Connect key points with larger course objectives during class sessions.	4.67	4.33	0.34	-2.11	0.035*
Summarize key points throughout each class session.	4.62	4.38	0.24	-1.667	0.096
Begin each class session with an outline/agenda of the topics that will be covered.	4.43	4.14	0.29	-1.403	0.161
Repeat the question back to the class before answering when a question is asked during a class session.	4.24	3.52	0.72	-2.506	0.012*
Create multiple opportunities for engagement.	4.76	4.43	0.33	-1.611	0.107
Use a variety of instructional formats in addition to lecture, such as small groups, peer assisted learning, and hands-on activities.	4.86	4.86	0	1	0.000
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).	3.62	3.00	0.62	-2.437	.015*
Survey my classroom in advance to anticipate any physical barriers.	4.10	3.38	0.72	-2.223	0.026*
Supplement class sessions and reading assignments with visual aids (e.g. photographs, videos, diagrams, interactive simulations).	4.43	4.10	0.33	-1.611	0.107
Use interactive technology to facilitate class communication and participation (e.g. Discussion Board).	3.95	3.75	0.2	-0.711	0.477

* Significance P>=0.05

Using a non-parametric statistical measure – the Wilcoxon signed ranks hypothesis test – the researchers found that there was a statistically significant difference between faculty attitudes toward the importance of strategies compared with the implementation of these strategies in their classrooms in relation to four of the 18 inventory items (22 percent) (see Table 1). The four items that were statistically different were: connect key points with larger course objectives during class sessions (z = -2.00; p = 0.035); repeat the question back to the class before answering when a question is asked during a class session (z = -2.506; p = 0.012); 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) (z = -2.437; p = 0.015); and survey my classroom in advance to anticipate any physical barriers (z = -2.223; p = 0.026).

RQ2: What are *student* attitudes toward and the implementation of principles and practices in the classroom? Is there a statistically significant difference in *student* attitudes toward and the implementation of principles and practices in their classrooms?

Student agreement to statements about the importance of UD was higher than their agreement with statements about the implementation of the items in their classrooms for all items (see Table 2).

Table 2: Student Attitude and Implementation

	Student Attitude Mean	Student Action Mean	Difference in Means	Wilcoxon Z score	P value
Allow students to express comprehension in multiple ways.	4.51	3.81	0.70	-4.445	0.000
Allow students to demonstrate their knowledge and skills in ways other than traditional tests and exams (e.g. written essays, portfolios, journals).	4.49	3.61	0.88	-4.983	0.000
Allow flexibility with assignment deadlines in my course(s) for ANY student who expresses a need.	4.0	3.07	0.93	-4.703	0.000
Allow flexible response options on exams (e.g., change from written to oral) for ANY student who expresses a need.	4.07	2.91	1.16	-5.126	0.000
Post electronic versions of course handouts.	4.48	3.82	0.66	-4.267	0.000
Use a course website (e.g. Blackboard or faculty web page).	4.52	4.26	0.26	-2.131	0.033
Post lecture notes online (on Blackboard or another website) for ALL students.	4.52	3.73	0.79	-4.862	0.000
Allow students flexibility in how they submit assignments electronically (e.g. mail attachment, digital drop box).	3.74	3.13	0.61	-3.261	0.001
Connect key points with larger course objectives during class sessions.	4.32	3.88	0.44	-3.030	0.002
Summarize key points throughout each class session.	4.53	3.78	0.75	-4.906	0.000
Begin each class session with an outline/agenda of the topics that will be covered.	4.04	3.43	0.61	-4.007	0.000
Repeat the question back to the class before answering when a question is asked during a class session.	4.10	3.36	0.74	-4.837	0.00
Create multiple opportunities for engagement.	4.51	3.89	0.62	-3.977	0.00
Use a variety of instructional formats in addition to lecture, such as small groups, peer assisted learning, and hands-on activities.	4.38	3.90	0.48	-3.691	0.000
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).	4.25	3.46	0.79	-4.585	0.000
Survey my classroom in advance to anticipate any physical barriers.	4.04	3.20	0.84	-4.484	0.000
Supplement class sessions and reading assignments with visual aids (e.g. photographs, videos, diagrams,	4.3	3.67	0.63	-4.577	0.000

interactive simulations).					
Use interactive technology to facilitate class communication and participation (e.g. Discussion Board).	4.04	3.75	0.29	-2.121	0.34

* Significance P>=0.05

Using a non-parametric statistical measure – the Wilcoxon signed ranks hypothesis test – the researchers found that there was a statistically significant difference between student attitudes toward the importance of strategies compared with the implementation of these strategies in their classrooms in relation to all 18 inventory items (see Table 2).

RQ3:

(a) Is there a statistically significant difference between *faculty and students' attitudes* toward principles and practices in the classroom?

Using a non-parametric statistical measure – the Mann-Whitney U test – there was a statistically different response between the two respondent groups in relation to the importance of strategies for 5 of the 18 inventory items (28 per cent) (see Table 3). The five items that were statistically different were: allow flexibility with assignment deadlines in my course(s) for ANY student who expresses a need ($z = -2.163$; $p = 0.031$); post lecture notes online (on Blackboard or another website) for ALL students ($z = -2.397$; $p = 0.017$); allow students flexibility in how they submit assignments electronically (e.g. mail attachment, digital drop box) ($z = -3.022$; $p = 0.003$); use a variety of instructional formats in addition to lecture, such as small groups, peer assisted learning, and hands-on activities ($z = -2.526$; $p = 0.012$); and 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) ($z = -2.863$; $p = 0.004$).

Table 3: Difference between Faculty & Students (Attitudes & Actions)

Item	Z score (Faculty: Student Attitudes)	P value (Faculty: Student Attitudes)	Z score (Faculty: Student Action)	P value (Faculty: Student Action)
Allow students to express comprehension in multiple ways.	-0.426	0.670	-3.463	0.000*
Allow students to demonstrate their knowledge and skills in ways other than traditional tests and exams (e.g. written essays, portfolios, journals).	-0.377	0.707	-3.558	0.000*
Allow flexibility with assignment deadlines in my course(s) for ANY student who expresses a need.	-2.163	0.031*	-1.659	0.097
Allow flexible response options on exams (e.g., change from written to oral) for ANY student who expresses a need.	-1.734	0.083	-1.547	0.122
Post electronic versions of course handouts.	-1.602	0.109	-4.287	0.000*
Use a course website (e.g. Blackboard or faculty web page).	-1.493	0.135	-2.839	0.005*
Post lecture notes online (on Blackboard or another website) for ALL students.	-2.397	0.017*	-0.613	0.540
Allow students flexibility in how they submit assignments electronically (e.g. mail attachment, digital drop box).	-3.022	0.003*	-1.211	0.226
Connect key points with larger course objectives during class sessions.	-1.709	0.087	-1.927	0.054
Summarize key points throughout each class session.	-0.094	0.925	-2.462	0.014*
Begin each class session with an outline/agenda of the topics that will be covered.	-1.518	0.129	-2.864	0.004*

Repeat the question back to the class before answering when a question is asked during a class session.	-0.472	0.637	-0.662	0.508
Create multiple opportunities for engagement.	-1.082	0.279	-2.316	0.021*
Use a variety of instructional formats in addition to lecture, such as small groups, peer assisted learning, and hands-on activities.	-2.526	0.012*	-4.541	0.000*
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).	-2.863	0.004*	-1.782	0.075
Survey my classroom in advance to anticipate any physical barriers.	-0.005	0.996	-0.629	0.529
Supplement class sessions and reading assignments with visual aids (e.g. photographs, videos, diagrams, interactive simulations).	-0.343	0.732	-1.936	0.053
Use interactive technology to facilitate class communication and participation (e.g. Discussion Board).	-0.756	0.450	-0.594	0.552

* Significance P>=0.05

(b) Is there a statistically significant difference between faculty and students' attitudes toward the *implementation* of principles and practices in their classrooms?

Using a non-parametric statistical measure – the Mann-Whitney U test – there was a statistically different response between the two respondent groups in relation to the implementation of strategies for eight inventory items (44 per cent) (see Table 3). The nine items that were statistically different were: allow students to express comprehension in multiple ways ($z = -3.483$; $p = 0.000$); allow students to demonstrate their knowledge and skills in ways other than traditional tests and exams (e.g. written essays, portfolios, journals)($z = -3.558$; $p = 0.000$); post electronic versions of course handouts ($z = -4.287$; $p = 0.000$); use a course website (e.g. Blackboard or faculty web page) ($z = -2.839$; $p = 0.005$); summarize key points throughout each class session ($z = -2.462$; $p = 0.014$); begin each class session with an outline/agenda of the topics that will be covered ($z = -2.864$; $p = 0.004$); create multiple opportunities for engagement ($z = -2.316$; $p = 0.021$); and use a variety of instructional formats in addition to lecture, such as small groups, peer assisted learning, and hands-on activities ($z = -4.541$; $p = 0.000$).

Only three faculty respondents added to the open-ended section of the survey that encouraged participants to add thoughts not covered in the survey. Their responses were as follows:

- "[Often] good intentions / personal expectations prove to be more difficult to follow through with... [there are] only so many hours in the day, only so much energy to expend."
- "More resources need to be put into UDL awareness and training; classroom and online training for teaching students with disabilities should be available and required. I have a blind student in one class and a student in a wheelchair in another class and both required accommodations that I wasn't trained to provide, so I had to learn on the fly."
- "I found that group work and one-to-one advising helps students with disabilities a lot."

Two students added to the open-ended section of the survey, as follows:

- "Perhaps allowing extra time outside of class for students to make appointments with COMM instructors would help a lot."
- "It is important for professors to BELIEVE students when they say they need help with something, or when they struggle."

DISCUSSION

Students with disabilities are a growing higher education sub-group in both the United States of America and abroad (A. Lombardi, et al., 2015); they are protected by state, federal, and local laws that prohibit discrimination and require equal levels of access to academic services, environments, and resources. Universal Design (UD) is a framework intended to provide flexibility and support to the greatest number of learners via a proactive approach to instruction design (P. King-Sears, 2014). Extant research has largely explored attitudes related to UD in the college classroom from a faculty or student perspective, this study explores perceptions of

UD among faculty and the students they teach (and student perceptions of the same faculty) using an adapted version of a self-report survey (ITSI and ITSI/S; (Gawronski, et al., 2016; A. R. Lombardi, et al., 2011).

The results of this study indicate that both faculty and student respondents strongly agree with the importance of each of the UD strategies/tactics presented in this study (across all six UD subsets: *Multiple Means of Presentation* (8 items), *Inclusive Lecture Strategies* (4 items), *Accommodations* (7 items), *Campus Resources* (3 items), *Inclusive Assessment* (4 items), and *Accessible Course Materials* (3 items). However, despite agreement from the two respondent groups about the importance of UD, the study found that for students, the valence of agreement with statements about the importance of UD was higher than their agreement with statements about the actual implementation of the strategies/practices by their instructors in their classrooms for all of the subset items (a statistically significant difference in agreement for all 18 items).

For faculty, the valence of agreement with statements about the importance of UD was also higher than their agreement with statements about the implementation of the strategies/practices in their classrooms for all but one of the items (faculty agreed more strongly in the 'action' portion of the survey vs. the 'attitude' portion to the item - 'allow flexibility with assignment deadlines in my course(s) for ANY student who expresses a need'). There was a statistically significant difference in agreement for only four items when faculty responses to the importance of UD was compared with their implementation of the strategies/practices in their classrooms for the following items: 'connect key points with larger course objectives during class sessions'; 'repeat the question back to the class before answering when a question is asked during a class session'; '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)'; and 'survey my classroom in advance to anticipate any physical barriers.'

When faculty attitudes were compared with student attitudes to UDL there was a statistically significant difference in agreement for 5 of the 18 items - 'allow flexibility with assignment deadlines in my course(s) for ANY student who expresses a need'; 'post lecture notes online (on Blackboard or another website) for ALL students'; 'allow students flexibility in how they submit assignments electronically (e.g. mail attachment, digital drop box)'; 'use a variety of instructional formats in addition to lecture, such as small groups, peer assisted learning, and hands-on activities'; and '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)'). For the most part, the valence of faculty and student agreement to statements about the importance of UD was similar.

With regard to faculty and students attitude toward the implementation of UDL in their classrooms, there was a statistically significant difference in agreement for eight of the 18 items, including: 'allow students to express comprehension in multiple ways'; 'allow students to demonstrate their knowledge and skills in ways other than traditional tests and exams (e.g. written essays, portfolios, journals; post electronic versions of course; use a course website (e.g. Blackboard or faculty web page); summarize key points throughout each class session; begin each class session with an outline/agenda of the topics that will be covered; create multiple opportunities for engagement; and use a variety of instructional formats in addition to lecture, such as small groups, peer assisted learning, and hands-on activities. Faculty and students mostly agreed with one another when responding to statements about implementation of strategies/practices in their classrooms.

In the open-ended portion of the survey, faculty indicated that "[Often] good intentions / personal expectations prove to be more difficult to follow through with... [there are] only so many hours in the day, only so much energy to expend" and that "[m]ore resources need to be put into UDL awareness and training; classroom and online training for teaching students with disabilities should be available and required." These findings align with research that indicates that faculty lack experience teaching students with disabilities, and how to properly implement accommodations (Baggett, 1994; Cawthon & Cole, 2010; Thompson, et al., 1997). It also aligns with research found that faculty overwhelmingly reported that they did not implement inclusive instruction in their classes, most likely due to a lack of relevant campus-wide professional development initiatives to provide faculty with training or information about UD (LaRocco & Wilken, 2013).

A student who participated in the study indicated that "[i]t is important for professors to BELIEVE students when they say they need help with something, or when they struggle." This supports previous research that found students decide for varying reasons not to self-disclose (Getzel & Thoma, 2008), including a fear that they will not be believed because of poor societal perceptions of people with disabilities (May & Stone, 2010), or if the disability is of a psychological or psychiatric nature, such as anxiety or depression.

While A. R. Lombardi, et al. (2011) found that female faculty were more likely than their male counterparts to accommodate students with disabilities, and tenure-track faculty appeared to be less accommodating and less

willing than non-tenure-track faculty, this finding was not borne out in the current study; in addition, age and ethnicity did not appear to impact faculty or student attitudes.

The findings outlined in the paper are potentially problematic in the context of research that indicates that inclusive instruction provides a more holistic approach to the design of materials and instructional methods, and has the potential to, among other things, reduce barriers, and increase student participation and success without extensive accommodations (Gawronski, et al., 2016) (Rose, et al., 2005) (CAST, 2018). Factors students have identified as having a positive impact on outcomes are access to disability support services and forming relationships with faculty (Getzel & Thoma, 2008), outlines of notes, pause and question procedures during lectures, reading guides, and study guides (Madaus, et al., 2003), and the use of digital materials, which are inherently flexible and customizable to individual student needs (Hall, et al., 2003).

Additional Recommendations for Implementation of UD in the College Classroom (adapted from A. R. Lombardi, et al. (2011):

- Provide instruction/information sessions with examples and resources
- Provide workshops to understand WHY and HOW of UD for the teacher and more rewarding for the student
- Consider developing a team approach with mentors and coaches
- Provide planning/meeting time
- Start small, one lesson or unit at a time, not abrupt change.
- Allow students to express comprehension in multiple ways.
- Allow students to demonstrate their knowledge and skills in ways other than traditional tests and exams (e.g. written essays, portfolios, journals).
- Allow flexibility with assignment deadlines in my course(s) for ANY student who expresses a need.
- Allow flexible response options on exams (e.g., change from written to oral) for ANY student who expresses a need.
- Post electronic versions of course handouts.
- Use a course website (e.g. Blackboard or faculty web page).
- Post lecture notes online (on LMS, Etc.) for ALL students.
- Allow students flexibility in how they submit assignments electronically (e.g. mail attachment, digital drop box).
- Connect key points with larger course objectives during class sessions.
- Summarize key points throughout each class session.
- Begin each class session with an outline/agenda of the topics that will be covered.
- Repeat the question back to the class before answering when a question is asked during a class session.
- Create multiple opportunities for engagement.
- Use a variety of instructional formats in addition to lecture, such as small groups, peer assisted learning, and hands-on activities.
- 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).
- Survey classrooms in advance to anticipate any physical barriers.
- Supplement class sessions and reading assignments with visual aids (e.g. photographs, videos, diagrams, interactive simulations).
- Use interactive technology to facilitate class communication and participation (e.g. Discussion Board).

CONCLUSION/LIMITATIONS

Without doubt, the growing population of students requesting accommodations creates challenges for college faculty and their students (Jensen, et al., 2004). An essential element of student persistence in college is the ability to develop meaningful student-faculty relationships (Astin, 1993; Tinto, 1993). Research indicates that, for the most part, faculty members are willing to provide accommodations for students with learning disabilities (Leyser, et al., 1998), but are challenged by perceptions that accommodations impact the academic integrity of courses, programs, and the institution (Bourke, et al., 2000). Vega and Tayler (2005) ague that the role of faculty has shifted, they are no longer merely responsible for ensuring a student learns the material, rather, their role is to facilitate students' interpretation of the information.

College faculty and students are undoubtedly operating in more competitive and dynamic environments than ever. It is therefore important to identify and eliminate potential barriers to learning and student success, particularly those with disabilities. Expanding knowledge of both groups' perceptions of UD strategies in the classroom will potentially benefit all parties. Extant research has largely explored attitudes toward UD from a

faculty or student perspective, this exploratory case study employed quantitative research methods to explore perceptions of UD among faculty and students they are currently teaching.

Although the survey response rate was relatively high (60 per cent for faculty and 16 per cent for students), the convenience nature of the study and small sample represents a limitation; subsequently, external validity is low. In addition, differences in perceptions may be due to differences in course management and instructor variables. Another limitation of the study relates to causal inference - selection bias in particular as students who participated in the study were not randomly assigned to classes. In addition, while each student was in a communication studies class, the course descriptions, learning goals and outcomes inevitably varied.

Future research will expand the study by incorporating qualitative elements, and increasing the representativeness and generalizability of the study by increasing sample size (including other universities).

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