The Faculty Perspective on Universal Design for Learning

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Abstract

This article presents the results of two studies on the applicability and use of universal design in higher education. In Study 1, the instructional climate for students with disabilities was assessed through a survey of 271 faculty members and teaching associates (TAs) and focus groups with 92 additional faculty members and TAs. Survey respondents ranked universal design for learning (UDL) as the most needed training topic. A web-based, self-paced professional development tool called FAME (Faculty and Administrator Modules in Higher Education) was developed, piloted, and revised in response to the training needs identified. In Study 2, a review of FAME by 98 faculty members and administrators supported the value of on-demand, multi-modal professional development in universal design. Ninety-two percent of respondents reported increased comfort in meeting the instructional needs of students with disabilities as a result of using this curriculum. Implications and specific guidelines for providing educational access to students with disabilities are discussed.

If you enter the educational debate about what good teaching entails, sooner or later you will encounter a resounding question: How can instructors meet the needs of an increasingly diverse body of learners? Whether discussing primary, secondary, or postsecondary education, this question resonates loudly among educators, researchers, and policymakers alike. Students who were once considered "nontraditional" are now the norm, as sociological factors have significantly altered the student constituency and thus are pushing at the doors of "tried and true" instructional practices that have been the bedrock of educational delivery for years.

A cross-sectional slice of the student population from nearly all postsecondary institutions reveals students with varied ethnic and cultural backgrounds; students whose first language is not English; students who are older than the traditional college student; and students with an array of learning, attention, psychological, and physical disabilities (Rose & Meyer, 2002; McGuire & Scott, 2006). Faculty are increasingly being challenged to recognize the impact of multiculturalism in the classroom, embrace a broad age range of students, and address the needs of students with disabilities in order to make higher education accessible to a diverse population of learners (Zeff, 2007).

Students with Disabilities in Postsecondary Education

A growing number of students with disabilities are pursuing postsecondary education. Fifteen years of data from the National Longitudinal Transition Study (NLTS) indicate that the rate of postsecondary participation by youth with disabilities has more than doubled, rising from 15% in 1987 to 32% in 2003 (Newman, 2005). This is significant as people who earn a college degree have a higher lifetime earning potential than high school graduates, and individuals with disabilities who earn a Bachelor of Arts degree obtain subsequent employment at nearly the same rate as their counterparts without disabilities (Wehman &

Yasuda, 2005). However, despite increasing enrollments and the benefits of a college education, students with disabilities continue to lag behind students without disabilities in terms of college participation and retention rates (Stodden, 2005). According to the National Longitudinal Transition Study 2 (NLTS2), nearly 30% of exiting high school students with disabilities enrolled in college, compared to 40% of the general population. Further, one year after high school graduation, only 10% of students with disabilities were still enrolled at 2-year colleges, and only 5% were enrolled in four-year colleges (Wagner, Newman, Cameto, Garza, & Levine, 2005). Clearly, students with disabilities often struggle to complete first-year college courses and many fail to complete a quality education (Stodden & Dowrick, 2001; Stodden, Jones, & Chang, 2002).

The education gap between students with and without disabilities is partly due to faculty members lacking the knowledge and skills to teach students with disabilities. Despite the mandates of the ADA and Section 504 to teach and accommodate equal educational access to students with disabilities, many administrators, faculty members, and graduate teaching assistants report that they do not know how to accommodate students with disabilities (Bourke, Strehorn, & Silver, 2000; Dona & Edmister, 2001; Hindes & Mather, 2007; Izzo & Lamb, 2002). Faculty members rarely receive formal training in pedagogy (Weimer, 1990) or in strategies for creating inclusive classrooms (Burgstahler, Duclos, & Turcotte, 1999). Improving the skills of faculty to effectively teach students with diverse learning needs could markedly improve postsecondary education and career outcomes for individuals with disabilities.

Universal Design as an Inclusive Practice

As growing trends of diversity push up against pressures for increased accountability (Carey, 2006) and the development of new strategies to improve student learning (Spelling Commission on the Future of Higher Education, 2006), how are faculty members to respond? There is no easy answer, no one-size-fits-all solution, but there are effective strategies that can be applied to support student learning and performance. One strategy gaining attention from researchers, administrators, and faculty members alike is universal design applied to teaching and learning environments (e.g., Burgstahler & Cory, 2008; McGuire, Scott, & Shaw, 2006; Rose & Meyer, 2000).

The universal design movement took hold in architecture in the 1980s and early 1990s and calls for "the design of physical environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design" (The Center for Universal Design, 1997). When applied to higher education, universal design represents a cohesive approach to promoting inclusion, one that considers, on an ongoing basis, how curriculum, instruction, and assessment can be designed to meet the learning needs of the greatest number of students without compromising academic rigor. The concept of universal design conceptualizes what is traditionally and anecdotally known as 'instructional best practice' and offers a more comprehensive approach to good teaching (Higbee, 2008).

One of the pioneers in applying the idea of universal design to education was CAST (Center for Applied Special Technology). Although initially focused on K-12 education, CAST has broadened its scope to include the application of universal design for learning (UDL) principles to professional development in higher education (Zeff, 2007). As an approach to curriculum development, UDL ensures that students with a wide range of abilities can access and succeed in the general curriculum. From a neurological standpoint, people learn in distinct ways regardless of their backgrounds. People recognize, strategize, and affectively process information using many different strategies, and no two people have the same strengths and weaknesses in their learning styles. In short, people do not have one general learning aptitude, but many learning abilities; thus, a disability or challenge in one area may be compensated for by extraordinary abilities in another. In order to meet the needs of all learners, educational, emotional, and technological barriers must be minimized, and flexible teaching strategies must be incorporated into curricula (Block, Loewen, & Kroeger, 2006; Rose & Meyer, 2002).

The framework of UDL consists of instructional approaches that provide students with choices and alternatives in the materials, content, tools, context, and supports they use. According to CAST, three basic principles underlie UDL: multiple means of representation and presentation, multiple means of strategic engagement, and multiple means of expression (Rose & Meyer, 2002; Sopko, 2008; Stahl, 2003). Multiple means of representation refers to multi-modal teaching, relying on a mixture of mediums (e.g., lecture, video, group discussions) to relay concepts. Multiple means of strategic engagement refers to maximizing student learning through motivation and relevancy so students have opportunities to interact with and learn the content. Lastly, multiple means of expression allows students to demonstrate their learning through multiple assessment opportunities through multiple

assessment opportunities (e.g., multimedia projects instead of written papers, or three quizzes and a project instead of one final exam). Generally speaking, these three UDL principles provide students with a variety of options for learning and different methods of assessments to express what they know. The UDL framework challenges educators to rethink the nature of their curriculum and empowers them with the flexibility to serve a diverse population of learners. In short, when applying UDL in the classroom, educators set clear goals, provide multiple opportunities for students to engage in learning, and assess progress often using multiple assessment opportunities. The intent of a universal design approach is to provide access to the curriculum for all students, including the large numbers of postsecondary students with disabilities who choose not to disclose their disabilities to their institutions - nearly 60% based on NTLS2 data (Wagner et al., 2005). Consider the current process through which students with disabilities gain educational access in higher education.

Students with disabilities who disclose their disabilities in order to obtain needed accommodations are often required to register with their institution's office of disability services. Field, Sarver, and Shaw (2003) cite several problems with this traditional model of providing educational access. First, students are required to disclose their disabilities to faculty members every semester and request "special" treatment in the form of reasonable accommodations. Interviews with students with disabilities reveal that this process can be humiliating and stigmatizing. Second, when faculty members are required to make accommodations for particular students, they often must retrofit or modify existing instructional and curriculum materials—a time-consuming and difficult task in some cases. Third, adhering to a formalized process for requesting accommodations places disability services personnel in the role of mediator between students and faculty members, promoting student dependence on disability services staff and discouraging students from directly discussing their educational needs with faculty members. Incorporating instructional strategies that make learning accessible to a broad range of learners—while it will not eliminate the need for individual accommodations—provides a more inclusive alternative to the traditional accommodations process.

The Present Investigation

The purpose of this article is to present research findings from two projects at a large Midwestern university that were undertaken to study and develop faculty training materials for improving the quality of postsecondary education for students with disabilities. Supported by grants administered from 1999-2006 from the Office of Postsecondary Education, U.S. Department of Education, these multi-method, multi-site projects empirically assessed (a) the instructional climate for students with disabilities, (b) the perceived need among faculty and administrators for professional development on how to facilitate educational access for all students, and (c) the effectiveness of web-based, on-demand curricula called FAME (Faculty and Administrator Modules in Higher Education) developed in response to faculty needs. For the purposes of this article, the research methods and results discussed from the two interrelated projects will be those pertaining to UDL.

Study 1

Methods

From 1999-2002, a multi-faceted climate assessment was conducted across seven academic units to guide the design of faculty development activities and products for enhancing the quality of education for students with disabilities. These units included five departments at the main campus of a large university in the Midwest, specifically, the departments of English, Human Ecology, Psychology, Biology, and Chemistry; one rural regional campus; and the department of Developmental Education at a community college. Climate assessment data were collected via a faculty and teaching associate (TA) survey and separate focus groups in each unit with four distinct participant groups: (a) faculty members, (b) TAs, (c) students with disabilities, and (d) students without disabilities. Because the focus of this article is the faculty perspective, only themes that emerged from the focus groups with faculty and TAs will be discussed, but it is important to mention that student data were a powerful basis for the triangulation of findings and subsequent development of the FAME curriculum.

Faculty and TA Survey

The survey was developed to examine the status of educational supports from the perspective of instructors within participating departments. Survey questions were designed to gain information on preferred training topics and means of delivery, perceptions of teaching students with disabilities, and instructional methods used by respondents in their classrooms. The response format for most of the 22 questions was multiple choice

or Likert scales with a few questions requiring instructors to rank order preferred training topics and methods. A faculty liaison within each academic unit was responsible for distributing the surveys to every faculty member and TA in his or her unit (often via departmental staff meetings) and for collecting the anonymous surveys from a designated place in the department.

Focus Groups

While the faculty and TA survey was designed to provide a quick snapshot of the instructional practices and needs across units, the focus groups were conducted to add a richer dimension to the numbers and to help elucidate the teaching-learning climate and trends across and within particular departments. Focus group participants were recruited by the faculty liaison in each unit through email requests and faculty meetings, resulting in the recruitment of 57 faculty members and 35 TAs across the seven academic units. Because two units did not have TAs, a total of 12 focus groups were conducted. The size of the focus groups ranged from 3 to 11 participants with a median size of 7. Each focus group lasted 90-150 minutes.

Faculty and TA focus groups were asked a core set of 12 open-ended questions, exploring four primary topics:

1. Experiences with students with disabilities, including the types of accommodations faculty have been asked to make; how students have requested accommodations; the unit's approach to educating students with disabilities; and recommendations for students on how to explain their learning needs and request accommodations from faculty;
2. Types of information requested about disability and accommodations and what the best methods are to provide faculty with this information;
3. Perceptions about effective instructional strategies, experiences with technology in the classroom, and the effect on instructional methods of having students with disabilities in a class; and,
4. Suggestions for improving the educational experience of students with disabilities in the unit, specifically, "What can faculty and administrators and students do to improve the quality of education for students with disabilities in your college/department?"

The focus group discussions were audio-recorded and transcribed. Three independent researchers reviewed the data, and the data were systematically analyzed following Morgan's (1988) recommendations.

Results and Discussion

Faculty and TA Survey

Out of 1,150 surveys distributed across the seven units, 271 were completed and returned, for a response rate of 24%. The professional profile of the sample revealed that 42% identified themselves as graduate TAS. Of the remaining 58%, 13% reported they were full professors, 20% reported they were associate professors, 9% reported they were assistant professors, 3% reported they were lecturers or instructors, 9% reported they were adjuncts, and 4% selected "other". The median number of years respondents reported having taught was 4.5, and 78% responded teaching at a four-year institution.

Of particular note is that 27% (73) of the 271 respondents stated that they wanted training on UDL first and foremost, while 15% (41) preferred training on web accessibility, and 11% (30) preferred training on distance education. Fewer respondents indicated that they would be most interested in training on adaptive technology, computer lab accessibility, federal mandates related to students with disabilities, providing accommodations, teaching students with a specific disability, overview of the Office of Disability Services, or developing departmental policy. With regard to type of training modality preferred, 35% (95) of the 271 respondents reported that they wanted technical assistance via an "on-demand" web-based format, 30% (81) preferred two- or three-hour workshops. The responses of the remaining one third of respondents were spread evenly across the other response categories (one-hour or full-day workshops, handouts, brown bag lunches, one-on-one consultation, mentoring, and departmental faculty meetings).

When asked how often they use particular instructional methods, the majority of respondents reported always or frequently using lecture (84%), class discussion (71%), and critical thinking or problem solving activities (66%). Fewer than half of the respondents reported always or frequently using other methods such as small group or panel discussion, video, and guided notes. These findings indicate that, while faculty are not one-dimensional in their teaching, there is room for greater inclusion of multimodal practices.

Focus Groups

The findings from the separate focus groups with faculty members and TAs substantiated and elaborated upon the results from the survey data. An analysis of the data revealed five categories of themes present across the units: (a) creating a welcoming climate for students

with disabilities, (b) student disclosure of disability/learning needs, (c) student-faculty-Disability Services roles and communication in the accommodations process, (d) specific knowledge of different disability types, and (e) designing instructional practices to meet the diverse learning needs of all students. Even though the data have been compartmentalized into distinct categories for ease of discussion, in reality themes across categories are very much interrelated in their contributions to universally designed pedagogy.

Because data related to the last category—designing instructional practices to meet the diverse learning needs of all students—most directly addresses UDL, themes in this category will be discussed in greater detail. Three consistent themes emerged from the data (a) perceived uncertainty about how to meet the learning needs of an increasingly diverse and technologically expectant student demographic, (b) instructional strategies used to support student learning, and (c) the need for training and technical assistance on promoting education access. Examples and quotes from focus group participants are used to illustrate these themes.

Perceived uncertainty about meeting diverse student learning needs.

Many instructors voiced frustration about their inability to meet the instructional needs of all the students in their classes. A faculty member in Human Ecology described one such situation:

> Every student is a different case. One time, I was trying to schedule exams for a student who is blind, and I became very frustrated. The reader was not sufficient. I had to come up with alternate ways to test the student.

The frustration experienced by an English TA who was unable to intervene effectively on behalf of a student who was struggling with writing can be heard in this quote:

> I did not know how to help her. I felt like it was my job to help her, and I needed to find a way to help her, but I do not think that I did. She became very discouraged.

This comment suggests that the instructor recognized the student's frustration as she struggled to meet the learning objectives for the course.

An instructor in the English department hypothesized about how technological advances have shaped the preferred communication style of some students:

> There is a new culture of students emerging. Students spend a lot of time in chat rooms. One student wrote about how he felt very safe there. He had problems interacting with students. I think that is why he could break through in his writing. He was never able to do that in class or group work.

Instructors noted that it is particularly difficult to know what to do when they suspect a student has a disability but the student is not registered with the Office of Disability Services and/or has not requested an accommodation. While most instructors reported some degree of uncertainty about meeting the diverse learning needs of students in their classes, they also shared some of the specific instructional strategies they use to make the curriculum accessible to their students.

Instructional strategies employed by faculty members and TAs.

Even though most instructors could not provide a definition of UDL or articulate the processes by which UDL strategies enhance the teaching and learning environment, some were able to share strategies for "good teaching." For example, an experienced faculty member from Human Ecology stated,

> I think the course should be taught in many different ways. I think that the students should have to hear it, read it, and say it. I think that it will help everyone in the room. If you are trying to help everyone, you will help students with disabilities.

This suggestion reveals an understanding that multi-modal methods of representation can assist a wide range of students, including students with disabilities. Other instructors indicated that they provide lecture notes in class or post them to the class website.

A strategy shared by an English TA highlights awareness of the value of providing students with multiple means of engagement and multiple means of expression. She stated, "I vary my technique. Sometimes we talk and then write. Sometimes we just talk. Sometimes I have them draw the poem. I try to get people to be able to show their skills in different ways." A faculty member in Human Ecology distributes a survey to students at the beginning of the semester requesting information about how they learn best. The professor then uses this feedback to determine the primary instructional methods she will use in the class. A final strategy for encouraging students to engage in the curriculum was shared by an instructor who commented, "I really try to explain to them why we are doing something and what I want them to get out of it."

Need for training and technical assistance on promoting educational access.

Instructors acknowledged a need for additional training to support student learning, particularly the learning of students with disabilities. Instructors voiced a desire for training about how to meet the needs of students with disabilities who choose not to disclose their disabilities due to concerns about being stigmatized. A faculty member in Chemistry highlighted the potential for technological advancements to provide greater access to the essential course content:

> We need dissemination of technology. We really do not know what is out there. If we were better informed, we could make better decisions. I think that a lot of the computer stuff appropriate for students with disabilities would help all students.

Specific means for disseminating information and resources were also suggested by focus group participants. On faculty member stated, "You get so much information when you are new that you can't remember it all. We need a website to consult in difficult situations." Another suggested having a number to call for assistance and advice, "like a hotline." Still another requested a copy of frequently asked questions and answers related to providing educational access to today's students.

As evidenced by the preceding discussion, UDL strategies resurfaced over and over as an important approach to the teaching-learning process. Even when faculty did not know the UDL nomenclature, they knew what multiple instructional methods were and why they were important, but they struggled with how to implement these methods in their classrooms – not just with regard to their presentation or delivery of materials, but also with regard to how to maximize student choice and investment in classroom assignments. They struggled with how to assess student knowledge in ways that capitalize upon learning strengths without compromising the desired rigor of testing for student content mastery or performance of skill.

While concerns about academic equity were iterated across focus group discussions, so too was the belief that what is good instructional practice for students with disabilities often benefits students without disabilities, and that the instructional divide between these two groups is perhaps more of a matter of perception. As one faculty member expressed, "The most important thing is for me to protect the integrity of my class. The way I can do that is to be fair."

Study 2

Findings from the climate assessment process were clear: Faculty wanted more professional development training on UDL, and they wanted to access training on an as-needed basis. They wanted to be able to consult some type of training or resource that would be available 24/7 and that would be specific enough to offer basic guidance when a student discloses a disability before asking Disability Services to intervene.

In response to identified professional development needs, the FAME curriculum was developed and piloted from 2003-2006. FAME consists of five in-depth modules of instruction to enhance faculty and administrator understanding of effective teaching and learning practices: (a) Rights and Responsibilities in the Accommodations Process, (b) Universal Design for Learning, (c) Web Accessibility, (d) College Writing, and (e) Climate Assessment. In order to exemplify UDL through both form and content, the FAME curriculum incorporates multimedia representations of concepts. For example, essential content is defined as vocabulary terms and discussed in the text and, when feasible, national experts, faculty members, and students share their insights, feedback and perspectives through video clips. Each video clip is captioned, and a video transcript is available for the user who prefers to read the content versus watching the video. The video clips and transcripts provide opportunities for strategic engagement, since many of the videos share authentic testimonials by both students and faculty. Multiple means of expression are provided through applied case scenarios with response feedback, pre- and postassessments, and opportunities for practice and relearning (visit FAME at www.oln.org/ILT/ada/Fame/).

These modules, including the UDL module, were developed in a stepwise fashion beginning with a formal, research-based curriculum development process known as DACUM (see www.dacumohiostate.com/process.htm) to identify and verify essential competencies that each module should contain. Once faculty, Disability Services personnel, students with disabilities, and learning experts agreed upon competencies for a module, a writing-review-and revision process was initiated and followed until the module was ready for piloting.

Methods

The collection of FAME was systematically evaluated through a two-step piloting process. Level 1 piloting consisted of in-depth usability protocols so that the content of the curricula and the technology delivering it could be revised based on formative feedback from faculty and administrators. A survey with 48 Likert-scale response items evaluated ease of navigation, skill level of module content, pre- and posttest content, design of the computer interface, system reliability, and campus technology access and configuration. Open-ended questions were asked regarding content, navigation, and recommendations for revisions. Faculty and administrators were recruited by Disability Services administrators from five institutions of higher education, including two community colleges and three four-year universities located in the Midwest and Eastern regions of the United States. A total of 63 faculty members and administrators formatively evaluated the content of the UDL module and the functionality of the website navigation. Faculty and administrators who completed the usability protocols met with their designated Disability Services liaison in a group setting to return their usability protocols, discuss the module, and make recommendations to the development team.

Compared to the formative focus of Level 1 piloting, the focus of evaluation in Level 2 piloting was more summative in nature. In total, 35 faculty and administrators participating in Level 2 piloting evaluated the UDL module over a three-month period. A 12-item survey instrument with mostly Likert-scale response items was administered to assess the content. An open-ended section requested information on the module's effectiveness as a learning tool and its feasibility of application in the local campus context. Level 2 pilot sites included faculty and administrator participants from 23 colleges and universities of all types from every geographic region of the United States. These colleges and universities were recruited via AHEAD workshops conducted at annual conferences. Following the Level 1 procedure, a Disability Services professional from each school served as the project liaison responsible for recruiting faculty and administrator participants and collecting data, which in turn were anonymously reported to the development team.

Results and Discussion

The combined total of Level 1 (n = 63) and Level 2 (n = 35) faculty and administrators who piloted the UDL module was 98. For the 63 faculty who reviewed the UDL module via Level 1 piloting, survey items from the usability protocols revealed that at least 92% strongly agreed or agreed with each of the following statements:

- Overall, I liked the FAME content (95% of respondents)
- The information is applicable to my professional development needs (94%)
- I now feel more comfortable meeting the needs of students with disabilities (92%)
- I would recommend the FAME resource to a faculty or administrative colleague (95%)

Moreover, when asked to rate their degree of knowledge about UDL practices before completing the UDL module, only 31% of the Level 1 respondents reported a moderate or very high degree of knowledge; this percentage increased to 83% after taking the UDL module. Similarly, results from Level 2 piloting indicated that 97% of respondents strongly agreed or agreed with recommending the FAME resources to a colleague, and the percentage of respondents who reported a moderate or very high degree of UDL knowledge increased from 29% before taking the module to 94% after taking the module.

General Discussion

Two sequential studies were conducted to examine faculty members' experiences, perceptions, instructional practices, and training needs with regard to students with disabilities. Results from both faculty surveys and focus groups revealed that UDL was the most preferred training topic. Common themes emerging from the focus group analysis indicated that faculty members expressed needs for training and technical assistance on how to promote educational access and meet the diverse learning needs of their students. In addition, faculty members wanted information about UDL and other effective instructional strategies. They recommended the development of on-demand training that could be accessed from anywhere at any time. As a result, a series of 13 short information briefs entitled Fast Facts for Faculty (http://ada.osu.edu/resources/fastfacts/) and five web-based modules (http://www.oln.org/ILT/ada/Fame/) were developed.

The evaluation of the FAME UDL module was positive, with over 90% of survey respondents from 23 institutions nationwide reporting increases in their knowledge about UDL. Due to the expressed interest

and need of faculty to understand how to meet the diverse needs of today's college students, the following implications for teaching using UDL guidelines are provided.

Implications for Teaching and Learning

Numerous authors have recommended effective teaching strategies for students in higher education (Burgstahler, 2008; Chickering & Gamson, 1987; Higbee, 2003; Scott & McGuire, 2003). Yet, as evidenced by the results of the faculty survey and focus groups in Study 1, many faculty members struggle with how to meet the learning needs of increasingly diverse and technologically expectant students.

Drawing from the literature and from the process of developing and evaluating the FAME professional development resources, seven practical guidelines for integrating universal design into higher education have been developed. These guidelines encourage instructors to (a) create a climate that fosters trust and respect, (b) identify essential course content, (c) use a variety of instructional methods, (d) provide multiple means for students to access the course content, (e) integrate natural supports for learning, (f) allow for multiple methods of demonstrating understanding of essential course content, and (g) stay current on new and promising instructional technologies. Each of these will be discussed in more detail below.

Create a classroom climate that fosters trust and respect. An initial step faculty members can take to create an environment that fosters trust and respect is to develop a syllabus that clearly delineates the course objectives and policies. The syllabus should include a statement encouraging all students, including those with disabilities, to meet with the instructor if they need special considerations or accommodations. This statement opens the lines of communication between the instructor and students, and it presents flexibility, disability, and accommodations as routine elements of the course. Students may respond with an increased level of motivation to engage in the course because the faculty member has acknowledged that even in the best universally designed course, some students will benefit from additional considerations or accommodations.

Another way to foster trust and respect is to establish a learning environment in which students can interact, knowing that prejudice and ridicule will not be tolerated. Faculty members who model positive regard for racial, gender, and cultural diversity and who share their expectations that students will follow their lead create a more respectful classroom environment.

Identify the essential course content. The syllabus serves as a contract between the faculty member and the student, outlining expectations and requirements for successful completion of the course (The Ohio State University Partnership Grant, 2000a). A detailed syllabus helps students prioritize their learning tasks and organize their schedules. Unfortunately, the goals of many postsecondary courses traditionally are ambiguous, with syllabus statements such as "teach information and ideas, specifically about applying neuroscience to education" (Rose, Harbour, Johnston, Dalley, & Arbarbanell, 2006, p. 139). The focus of this example is on what the instructor will do, instead of on the specific knowledge, skills, and behaviors that the student will exhibit to demonstrate mastery of course content. Ideally, the learning outcomes of a course will represent a balance across six domains: knowledge, comprehension, application, analysis, synthesis, and assessment (Anderson & Krathwohl, 2000; Bloom, 1956). In addition to listing course objectives and class policies, a detailed syllabus delineates student learning objectives, provides assignment instructions and grading rubrics, specifies test dates and assignment due dates, and references additional resources to support student learning.

Use a variety of instructional methods. The survey results from the present investigation indicate that 84% of instructors use the lecture method always or frequently. Although lecturing may be viewed as a versatile and efficient use of instructional time, as a sole method of instruction lecturing provides minimal feedback and presents challenges to students who are not auditory learners or are poor note-takers (Heward, 2002). Faculty members who use a variety of instructional strategies are better able to meet the diverse learning needs of students, all of whom bring to the classroom their own unique learning strengths and styles.

Stahl (2003) recommends including multiple presentations of essential concepts so that students learn the key characteristics and extract the critical features that define a pattern (e.g., recognizing a concept such as "justice" by categorizing multiple examples of quotes, film clips). He also recommends delivering course content in a variety of contexts (e.g., whole-class discussion, one-on-one instruction, online chats) and through a variety of media (e.g., video, speech, text, diagram, and animation). Faculty focus group participants in Study 1 reported using demonstrations, tutorials, review sessions, and question-and-answer periods to provide multiple representations of essential content and engage students in learning.

Provide multiple means for students to access the

essential course content. There are many universal design strategies instructors can employ that range on a continuum from high tech to low tech. With regard to note taking, Rose et al. (2006) cited an example of a professor who each class period has three different students post their lecture notes to the class website. The authors pointed out that these multiple examples reinforce students' recognition network and give all students an opportunity to compare their own notes with other students' notes as a means of self-monitoring their learning. Heward (2002) recommends another strategy: posting guided notes (incomplete lecture outlines) to a course website or distributing guided notes in class to promote active attention and engagement.

As a higher-tech example, students with visual or learning disabilities can use text-to-speech software programs to hear course content and process it aurally as opposed to visually. Closed captioning can help a student who relies on English as a second language as well as a person with a hearing impairment or impaired auditory processing. Scanning material from hard copy to digital form can be useful for students with disabilities, older students, and students for whom English is a second language because it allows for editing and formatting consistent with learning strengths and strategies. While the implementation of universal design does not have to rely solely on technology, technology is a useful medium for maximizing student access to course content (Meyer & Rose, 2005), especially when instructors employ the principles of web accessibility (Sweeney, 2003).

Integrate natural supports for learning. In-class, out-of-class, and online activities can be used as natural supports for learning. Examples include developing study guides covering course material and providing self-paced online study modules or exercises. Instructors can also utilize student-to-student interaction to support learning. Finally, peer mentoring, cooperative learning, and students discussing review questions in small groups are examples of this strategy. Learning activities available via a course website can be accessed by students 24 hours a day, seven days a week. Online discussion boards and study chat rooms create a venue outside of class in which students can react to course content through questions and dialogue. Peer feedback via structured prompts on discussion boards can provide opportunities for expanded reflection, discussion, and critical thinking that ordinarily would not occur in a time-limited class session.

Allow multiple methods of demonstrating understanding of essential course content. At the postsecondary level, student assessment usually takes the form of timed exams delivered in class (Ofiesh, Rojas, & Ward, 2006), often using a multiple-choice format (Rodriguez, 2005). This conventional approach to assessment limits the ways in which students can demonstrate what they know. This can be especially detrimental for students who have test anxiety, difficulties processing what they read or write, or a primary language other than English. For students with disabilities, this traditional mode of testing often requires exam accommodations (Ofiesh et al., 2006). Stahl (2003) recommends designing assignments and evaluation activities that provide students with a choice of several topics and/or several presentation formats (e.g., paper, project, or YouTube video). Likewise, Rose et al. (2006) recommend offering students a choice of whom they would like to work with and the type of product they use to express their learning.

By establishing multiple ways of demonstrating attainment of course learning goals, students have the option of choosing learning modalities that capitalize on their individual strengths, thus improving the likelihood of success in the class. For example, a student with an information processing disorder may master the essential elements of the course but be unable to demonstrate what he or she has learned on a written exam. By placing tests or quizzes online, the student could use a screen reader or other assistive technology device to access the material.

Stay current on new and promising instructional technologies. The various technological media expanding the capabilities and reach of UDL are increasing at an exponential rate (Meyer & Rose, 2005). Faculty now post lecture notes and other media resources to course websites and create podcasts of their lectures so students have access to class materials 24/7. Students download class resources to their computer desktops or iPods, review them before class, and come to class better prepared for learning. Instructors use whiteboards to gain instantaneous feedback from students who use clickers to answer questions embedded in a PowerPoint presentation. As illustrated by these examples, advances in technology are reaching into every corner of campus and changing the educational process along the way.

To stay current on instructional technology, faculty members can subscribe to professional journals or newsletters or attend conferences that highlight advances in the field. Browsing software company websites and exploring technological simulations online are also effective means of obtaining up-to-date information on technology and instructional practices. In addition, joining technology-related listservs is a good

way to stay current with discussions and trends in the field. For example, CAST has a national consortium on UDL (see http://www.cast.org/udl/index.cfm?i=359). Another way to obtain current information is to enroll in computer courses, faculty development trainings, or learning communities that address instructional technologies. Although it may be difficult to fit these professional learning activities into an already overbooked schedule, the information obtained can increase teaching effectiveness and provide technological tools for creating an inclusive classroom.

In summary, these guidelines emphasize the need for faculty to meet diverse student learning needs with equally diverse methods of instruction, engagement, and assessment. Versatile teaching and learning approaches that are sensitive to students' abilities and learning strengths will lead to greater student access to course content and ultimately to greater success in learning.

Limitations and Future Research

Universal design offers a promising approach to meeting the learning needs of the increasingly diverse college student population. The present investigation sought to assess faculty perceptions of instructional climate, the application of universal design in the classroom, and professional development needs related to providing educational access to students with disabilities. Although study samples included faculty, administrators, and TAs from across disciplines and from across a broad range of institutions (from two-year open-enrollment community colleges to public and private research universities with high enrollment standards), participants were neither randomly sampled nor fully representative of the faculty population teaching in higher education today. Given self-selection biases, we expect that the results reported represent those of instructors who are especially reflective practitioners, and thereby are more apt to choose to participate in studies such as these. Additionally, it is difficult to estimate the extent to which faculty responses mimicked the "politically correct" language that populates mission and vision statements found on the majority of college and university websites. The studies relied on self-reported data. Independent assessment of instructional climate and the presence of universal design features was not conducted due to a lack of validated instrumentation, limited resources to develop such research tools, and the urgency to develop professional development resources for faculty and administrators.

Although Study 2 represents an initial step in evaluating online professional development training in UDL, additional research is needed. Future studies should assess the impact of specific UDL strategies on student learning using objective and standardized assessments while controlling for learner variables such as innate ability, functional limitations of a disability, and motivation. Adding comparison classrooms on the same essential content taught through traditional higher education approaches would allow for evaluating the merits of specific universal design practices. Conducting focus groups and satisfaction surveys with both faculty and students participating in both traditional and universally designed classes would provide opportunities to triangulate the data to determine the educational effects and social validity of specific UDL practices.

The call for research on the efficacy of universal design in higher education has been sounded (Burgstahler, 2008; McGuire et al., 2006; Rose et al., 2006). Researchers must further develop and validate universal design principles, guidelines, and checklists across contexts and constituencies. Evidence-based research must be conducted and disseminated so faculty have the empirical foundation upon which to design and select curricula and assessments that meet the needs of a wide range of diverse learners without compromising the high standards and outcomes of higher education.

Conclusion

These studies show that faculty and administrators are attuned to the increasing diversity of college students and to the need for greater flexibility in instructional design while maintaining high standards to effectively teach these students and prepare them to enter the workforce of the 21st century. Faculty who receive on-demand, multi-modal professional development in UDL practices and climate assessment report that they are better able to meet the needs of students with disabilities in their classrooms. These findings are promising. They support the application of UDL as a paradigm for meeting the instructional needs of students with diverse learning needs. While universal design will not replace faculty members' responsibility to ensure that qualified students with disabilities have access to the accommodations they require, it has the potential to produce better learning outcomes for all students. Additional research is needed to validate the impact of the UDL approach and strategies on student learning outcomes and to determine the most efficient and effective means of providing this information to faculty.

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