# An Approach for Inclusive College Teaching: Universal Design for Instruction

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With diversity constituting a hallmark of American higher education, college classrooms are becoming increasingly characterized by students with differing educational histories, experiences, and cultural backgrounds. The importance of using inclusive instructional strategies becomes even more significant when teaching heterogeneous groups of students. Universal Design for Instruction (UDI) and its relevance for teaching college students with learning disabilities are presented, including the perceptions of these students about effective teaching methods and qualities of helpful college instructors gathered through focus group research methodologies. Observations are offered about the critical need to craft a rigorous research agenda regarding emerging educational practices based upon Universal Design, and recommendations for consumers are delineated.

The recent reauthorization of the Individuals with Disabilities Education Act (P.L. 108-446) can be viewed as an opportunity to reflect on progress attained over a 30-year period by students with disabilities who have benefited from the provisions of this statute. Learning disabilities comprise the largest single category of students served under this mandate (U.S. Department of Education, 2002), and postsecondary trends for these students underscore the increase in their pursuit of higher education. They now represent the largest single category of students with disabilities enrolled in two- and four-year postsecondary institutions (Henderson, 1999). College has become a realistic and frequently selected option as students with learning disabilities transition into young adulthood. While the data are limited regarding outcomes of college enrollment for these students, preliminary results suggest a reason for cautious optimism. Those who do graduate from a four-year program achieve outcomes not unlike their peers without disabilities in terms of annual full-time salaries and pursuit of graduate and professional studies (National Center for Education Statistics, 1999).

The influx of students with learning disabilities to colleges and universities has brought with it complex issues, some of which relate to students, some of which relate to faculty, and some of which dovetail with other factors that are prompting lively discussions about the need for changes in approaches to college teaching. Traditional aged college students with learning disabilities often experience transition trauma in an environment where expectations and services are vastly different from those they received in high school, and the methods of teaching typically rely heavily on the lecture approach. Student self-identification to a designated college disability professional is required if accommodations are to be provided, and the student must provide documentation of the disability that meets the requirements of the institution. Self-advocacy, self-discipline, and self-determination are critical skills for college students with learning disabilities who must demonstrate that they meet standards for admission and academic performance expectations (Brinckerhoff, McGuire, & Shaw, 2002). For faculty, compliance with provisions of the Americans with Disabilities Act (PL 101-336) has meant assuring that students with learning disabilities receive reasonable accommodations in access to classroom instruction and in the assessment of learning outcomes (Scott & Gregg, 2000). Faculty have also played key roles in other compliance-related issues such as delineating essential elements of academic programs to determine whether course substitutions are reasonable accommodations (Scott, 2002; Wolinsky & Whelan, 1999).

The increase in colleges and universities of students with learning disabilities parallels another trend in changing student demographics that is exerting a powerful force on campus priorities. Larger numbers of older students, minority students, part-time students, and first-generation students (Chronicle of Higher Education, 2003) bring with them different levels of skills, experiences, and expectations with implications for instruction. At a time when *society is undergoing a fundamental transformation from the Industrial Age to the Information age* (Dolence & Norris, 1995, as cited in Fink, 2003, p. 11), approaches to teaching are also expanding. Distance education and corporate universities represent challenges to the status quo as they promote a flexible approach to learning experiences and attract new kinds of students who are looking for a different form of instructional delivery. Fink (2003) recently cited reports from *The Chronicle of Higher Education* of public concerns about the poor quality of higher education. He referred to the works of several authors (Barr & Tagg, 1995; Campbell & Smith, 1997) who believe that a paradigm shift

relating to pedagogy is occurring from an emphasis on delivering instruction to promoting learning. In an era of budget cutbacks in higher education financing (Amone, 2004; Selingo, 2003), calls for accountability including performance-based appropriations (Fink, 2003), increasing competition from virtual universities, and shifting demographics that have implications for curriculums and programs (Wilgoren, 2000), *colleges where superior teaching is the rule rather than the exception ... enjoy a distinct advantage {*Seldin, 1995, p. 3).

In light of these converging trends—new kinds of students, a shift to the information age of advancing technologies, and dissatisfaction with the lecture model of transmitting knowledge (Courts & Mclnemey, 1993, as cited in Fink, 2003)—there is an opportunity to think more inclusively about instruction to embrace the diversity of learners and learning styles that characterize today's college classrooms. One emerging approach to promote inclusive college teaching is Universal Design for Instmction (UDI), a construct based upon the notion of Universal Design from the field of architecture. The focus of this article is on the development of UDI based in part upon funding to the Center on Postsecondary Education and Disability at the University of Connecticut from the U.S. Department of Education, Office of Postsecondary Education. Funded projects are focusing on developing supports for college faculty to assist them in assuring access to quality instmction for students with disabilities (U.S. Department of Education, n.d.). A component of our work, focus group research with college students with learning disabilities about effective instmction, is discussed as it relates to the constmct of UDI, and implications for professionals, consumers, and parents are addressed.

## Universal Design and Its Applications

### Universal Design: A Brief History

The idea of incorporating features that will accommodate human diversity into the design of buildings and products emerged in the 1970s and 1980s in the work of Ronald Mace and his colleagues at the Center for Universal Design at North Carolina State University (NCSU). Universal Design (UD) is defined as the design of products and environments to be usable by all people to the greatest extent possible by anticipating a variety of needs and abilities (Follette Story, Mueller, & Mace, 1998; The Center for Universal Design, 1997). Inherent in its application are benefits that accme not only for individuals with disabilities but also for a wider range of people. For example, the installation of electronic door openers facilitates building access for those using wheelchairs, but it also brings a benefit to those pushing strollers or pulling portable suitcases. Ramps that are an integral component of the architectural and landscape planning process from the beginning assure the aesthetics of a new building in contrast to retrofitting buildings with such accommodations.

To implement UD, seven principles were developed as the framework for the work of the Center at NCSU and a growing cadre of professionals in the field of design to train future architects and designers in an approach that views human diversity as the norm. This value system leads to products and environments that are usable to a wide audience: the diverse public (Welch, 1995; Wilkoff & Abed, 1994).

### Universal Design and Instruction

Given the value system that underlies UD, anticipating and proactively planning for diverse abilities, we found an intriguing parallel: in higher educational settings, diversity is becoming the norm, and today's classrooms include students with widely diverse backgrounds, experiences, and cultural mores. While faculty are legally required to provide reasonable accommodations for students with learning disabilities who request them and provide documentation to verity the need for such, too often the process becomes one of retrofitting changes and accommodations to a course. Extrapolating from the notion of UD and intentionally inclusive design and considering the work of Silver, Bourke, and Strehom (1998), who introduced UD in the instructional arena of higher education, we proceeded to explore the idea of applying the principles of UD to college instruction as a proactive way to preserve the integrity of a course while promoting learning for a broad range of students. The process of developing Universal Design for Instruction (UDI) is described in detail by Scott, McGuire, and Foley (2003), and a number of initiatives based upon this construct (Scott & McGuire, 2004) including the focus group research described in this article have been undertaken to examine this new paradigm as a way to promote equal educational access.

### Universal Design Instruction: An Approach for Inclusive Instruction

Universal Design for Instruction (UDI) embodies an approach to instruction that anticipates diversity in learners as the norm and *operates on the premise that the planning and delivery of instruction as well as the evaluation of learning can incorporate attributes that embrace heterogeneity in learners without compromising academic standards* (McGuire & Scott, 2002, p. 27). The Nine Principles of Universal Design for Instruction© (Scott, McGuire, & Shaw, 2001), based in part upon the principles of UD, can serve as a rubric to guide the implementation of UDI and inclusive college teaching. Depending upon the needs of faculty, the principles can serve as a tool in the design of a new course, or they can assist in the refinement

**Table 1**

**The Nine Principles of Universal Design for Instruction©**

| Principle | Definition | Example(s) |
|---|---|---|
| *Principle 1:* Equitable use | Instruction is designed to be useful to and accessible by people with diverse abilities. Provide the same means of use for all students; identical whenever possible, equivalent when not. | Provision of class notes on-line. Comprehensive notes can be accessed in the same manner by all students, regardless of hearing ability, English proficiency, learning or attention disorders, or notetaking skill level. In an electronic format, students can utilize whatever individual assistive technology is needed to read, hear or study the class notes. |
| *Principle 2:* Flexibility in use | Instruction is designed to accommodate a wide range of individual abilities. Provide choice in methods of use. | Use of varied instructional methods (lecture with a visual outline, group activities, use of stories, or web board based discussions) to provide different ways of learning and experiencing knowledge. |
| *Principle 3:* Simple and intuitive | Instruction is designed in a straightforward and predictable manner, regardless of the student's experience, knowledge, language skills, or current concentration level. Eliminate unnecessary complexity. | Provision of a grading rubric that clearly lays out expectations for exam performance, papers, or projects; a syllabus with comprehensive and accurate information; or a handbook guiding students through difficult homework assignments. |
| *Principle 4:* Perceptible information | Instruction is designed so that necessary information is communicated effectively to the student, regardless of ambient conditions or the student's sensory abilities., | Selection of text books, reading material, and other instructional supports in digital format or on-line so students with diverse needs (e.g., vision, learning, attention English as a Second Language) can access materials through traditional hard copy or with the use of various technological supports (e.g., screen reader, text enlarger, on-line dictionary). |
| *Principle 5:* Tolerance for error | Instruction anticipates variation in individual student learning pace and prerequisite skills. | Structuring a long-term course project so that students have the option of turning in individual project components separately for constructive feedback and for integration into the final product; provision of on-line "practice" exercises that supplement classroom instmction. |
| *Principle 6:* Low physical effort | Instmction is designed to minimize nonessential physical effort in order to allow maximum attention to learning. Note: This principle does not apply when physical effort is integral to essential requirements of a course. | Allow students to use a word processor for writing and editing papers or essay exams. This facilitates editing of the document without the additional physical exertion of rewriting portions of text (helpful for students with fine motor or handwriting |

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| | | difficulties or extreme organization weaknesses while providing options for those who are more adept and comfortable composing on the computer.) |
| *Principle 7:* Size and space for approach and use | Instmction is designed with consideration for appropriate size and space for approach, reach, manipulations, and use regardless of a student's body size, posture, mobility, and communication needs. | In small class settings, use of a circular seating arrangement to allow students to see and face speakers during discussion—important for students with attention deficit disorder or who are deaf or hard of hearing. |
| *Principle 8: A* community of learners | The instructional environment promotes interaction and communication among students and between students and faculty. | Fostering communication among students in and out of class by structuring study groups, discussion groups, e-mail lists, or chat rooms; making a personal connection with students and incorporating motivational strategies to encourage student performance through learning students' names or individually acknowledging excellent performance. |
| *Principle 9:* Instructional climate | Instmction is designed to be welcoming and inclusive. High expectations are espoused for all students. | A statement in the class syllabus affirming the need for class members to respect diversity in order to establish the expectation of tolerance as well as encourage students to discuss any special learning needs with the instructor; highlight diverse thinkers who have made significant contributions to the field or share innovative approaches developed by students in the class. |

* Note: From *Principles of Universal Design for Instruction* by Sally S. Scott, Joan M. McGuire, and Stan F. Shaw, Center on Postsecondary Education and Disability, University of Connecticut. Copyright 2001. Reprinted with permission.

of an existing course. The principles are not viewed as a checklist to apply to elements of instmction but rather as a framework for faculty to think reflectively about their teaching and approaches to broaden learning experiences and facilitate an inclusive classroom climate. Table 1 includes the nine principles and definitions as well as examples of their application to college instruction.

Given the newness of the construct, UDI, it is important to examine it in a number of ways to explore its validity. The next section describes one initiative that employed focus group research techniques with college students with learning disabilities.

## From the Field: Markers of Inclusive College Teaching

In order to gain insight into the perceptions of college students with learning disabilities about effective instruction and inclusive college classrooms, a series of four focus groups were conducted. A focus group research method was chosen in order to study the experiences, perceptions, and beliefs of students (Krueger & Carey, 2000). Focus groups have been noted to offer several advantages in capturing participant perceptions: (a) the use of open ended questions allows for student perceptions and experiences to guide the discussion rather than the framework of the researcher; (b) group participation and peer interaction encourages candid responses and sharing of experiences; and (c) the group provides a *safe* atmosphere resulting in a synergy that can *generate more than the sum of individual inputs* (Lederman, 1990, p. 119). In a study of college students with learning disabilities, Finn (1998) noted that *students also find focus groups stimulating and enjoyable. They appreciate an invitation to participate in a focus group because it makes*

*them feel that their opinions and experiences are important* (p. 47). Research questions for the study included the following:

- What are the perceptions of college students with learning disabilities related to the attributes of a good college course?
- What are the perceptions of college students with learning disabilities related to teaching methods and strategies that promote learning?
- What are the perceptions of college students with learning disabilities related to the challenges and barriers experienced in college instruction?

## Method

### Participants

The focus groups for the study included students with learning disabilities from three college campuses in the Northeast: a Research I university in Connecticut, an urban community college in Massachusetts, and a suburban community college in New York State. Each campus was participating in the Universal Design for Instruction Project at the University of Connecticut. The head of Disability Services on each campus identified possible participants from students with documented learning disabilities registered with their offices. Project staff recommended several considerations in identifying participants including diverse academic majors, age, and semester status. Students were sent a letter of invitation and offered a modest honorarium for their participation. In total, four focus groups were conducted with one campus facilitating two separate groups in order to accommodate busy student schedules. A total of 23 students participated in the four groups with demographic data available for the 15 students who chose to provide this information. Among those who did provide demographic information, there were nine males and four females. The range of ages was 19-42, and the students ranged from second to tenth semester status. The range in number of semesters students had received support services from Disability Services varied from one to ten. Eleven different academic majors were represented among participants.

### Procedures

*Interview guide development.* The interview guide was designed to provide a sequential agenda for the interviewer moving from an introduction to the рифове and ground rules of the session, to an icebreaker question, and into focused questions pertaining to specific information needs related to the research questions (Carey, 1994; Lederman, 1990). The interview guide was piloted on UDI project staff and revised to include preplanned probes under each major topical question (Morgan, 1988).

*Focus group sessions.* Each of the four focus group sessions was conducted on the respective home campus and facilitated by a site coordinator and UDI Project personnel. Sessions lasted approximately 1?—2 hours and were audio taped. Each focus group began with introductions and instructions for how to complete the consent forms and demographics questionnaire. The group facilitator then proceeded with the topics outlined in the interview guide.

### Analysis

Audiotapes from the four student focus groups were transcribed and subsequently analyzed for specific themes. The focus group interview questions were initially used as an organizational framework for analysis (Lederman, 1990). UDI project staff members first reviewed each transcript independently and identified possible themes within and between groups. After completion of independent reviews, project staff met together to discuss emerging themes and reach consensus on analysis. Each of the possible themes was discussed and refined to generate the final list of themes.

## Results

The results are presented as a synthesis across the four focus groups conducted on three college campuses. While students did mention some barriers and challenges, they shared examples of many positive learning experiences in their college environments. They spoke with enthusiasm about both the characteristics of a positive college classroom and the attributes of an effective college instructor. The strong parallels and similarities across campus settings provide insight into ways these groups of students with learning disabilities have experienced inclusive college classrooms.

### Effective Teaching Methods and Strategies

In response to the questions *describe the best course you've ever had in college*, and *what faculty teaching methods positively affect your learning,* students reported many instructional approaches that positively influenced their learning.

*Clear expectations.* Students spoke positively of professors who are clear and consistent with course expectations and who provide explicit information about the course. A comprehensive course syllabus with information about course expectations, policies (e.g., attendance), and assignments were noted as helpful. Following the syllabus schedule was a positive feature of a class, and conversely, rushing through course material with a focus on quantity at the expense of student understanding was noted as a negative aspect of a class.

*Advanced organizers and supports.* Students reported that effective instruction clearly emphasized important

information. In some classrooms, tins was achieved by providing students with advanced organizers and support materials. As one student noted, *He handed out a sheet before every class that said like what we had to do and what we had to make sure we had to get done for the day and with notes and stuff.... It was a really good experience.*

Another student shared, *The teacher has his own book which has all of the PowerPoint® slides all laid out in the book with lines next to them so when he 's doing lecture you can go through the book and write down whatever you want to in addition to what he has written, so I think it's a really easy learning class.*

Students stated that it was helpful when they were provided with outlines of lectures (with key topics and subtopics) or copies of lecture notes ahead of time. One student explained that when notes are not available, *you're not even paying attention to what he is saying, you 're Just writing, writing, writing.*

Other helpful supports included reading guides, chapter outlines, and study guides. A student explained how a professor was especially helpful in this regard, stating, *in each chapter she gave us an outline of exactly what she was going to cover.* Likewise, another student stated that when faced with large amounts of reading, *sometimes it's really hard for not even the kids with learning disabilities to pick out important details .... I think it's very important for the teachers to give us ... key points to focus on. I mean, we're gonna do it.*

*Information in multiple formats.* Students reported positive learning experiences often include information provided in multiple formats. For example, oral lecture materials might be presented concurrently with visual information. Students described the use of handouts, PowerPoint® slides, and spelling of complex words on the blackboard as all being helpful supports to a lecture. One student noted, *he would start off by literally drawing on the board like a flowchart on how the argument went, just stating the main ideas and I found that extremely helpful... so you can see it, like visualize the argument.*

*A welcoming classroom climate.* Affirmative classroom experiences cited by the students often included a description of positive classroom rapport and interaction established by the instructor. Many students mentioned the value of small class size in making connections with the instructor while others described approaches to making a larger classroom less intimidating. As one student described, *she made it like an open environment, like everyone was willing to share and question and whatever, and it just really helped to understand all of the material that we had.* Another student stated, *Everyone was trying to get to know each other ... we set the desks up in a circle, we changed it every time, and she wouldn 't sit at the head of the class ... she would sit right in the class with us, and that kind of made us feel like alright, what she had to say is just as important as what we have to say so everybody was really willing to share how they felt and question other things.*

In describing a large lecture class, another student commented, *He does a lot of things to personalize the class not just for me but for other students. He will write you a note and give it to you in class, saying I really appreciated what you said about blah, blah, blah in class the other day and I appreciate how you .... I feel that he has really gone the extra mile to make it personal like a one-on-one class.*

*Connecting with real life experiences.* Making connections between past learning experiences and associations or relevant interests was reported to aid student attention and interest. One student summarized this point by saying, *I find good teachers can somehow bring some association to what they're teaching to real life experience, to something the student understands.* Another commented, *He could give you things to look at. If you didn't understand that text he would relate it to another text that you might have a far better grasp on, because it was more current.* Another student described, *It's an early morning class, but it's really exciting to go to, the teacher makes it, it's all technical, everything is done through PowerPoint® with video clips, like Simpsons and Beavis and Butthead and funny stuff.*

*Frequent, formative feedback.* The students preferred professors who monitored their progress regularly and provided opportunity for dialogue and feedback such as personal comments and feedback on papers. Students reported benefiting when professors use pause and question techniques during lessons to allow time for student questions, or to challenge individual students or an entire class to engage in problem solving. Another described an interaction with a professor related to a course paper: *And she '11Just give me more ideas to go on, like, if I'll be puzzled about what to put in the next sentence, she won't like put it down ... she '11 make you think and she '11 ask you questions ... she '11 give you key words that make you think and figure it out on your own.*

*Support of individual learning needs within the group.* The students expressed appreciation for professors who were aware of individual learning needs within the larger class. They commented on the instructors' focus on helping all students to learn. For example, several students expressed an appreciation for professors who recognized that not everyone in the class has the same entry level of knowledge, or the same pace for acquiring new information. These instmctors were willing to give formative feedback and adjust the pace of instruction in order to assure the large majority of the class reached understanding before moving on.

Another student shared an experience from an English course in which the professor wrote on the board in cursive script. The student explained to the professor that he had difficulty reading cursive. From that point on, the student

said, *she very nicely shifted over to printing out all the materials either on a computer or on a typewriter... and if she wrote anything on the board she made sure it was on the paper.* At times, this individual support was related to the student's learning disabilities. One student described a professor who wrote personal notes that would say things such as *I understand where this could possibly be difficult because of your disability. This is how you could work on it. I would like to talk to you about it.*

Students also expressed appreciation of professors who were receptive when they disclosed their disability. A student shared the story of a positive interaction with a professor related to a test accommodation disclosure. As the student said, *I was really nervous about bringing the accommodation letter ... but he sat down and talked about ... what I would do, the entire process, like I guess he knew and understood it.* Another student spoke highly of a professor who was not only open to the fact that students had learning disabilities, but that *he was eager to help me at all times.*

*Effective assessment strategies.* Students mentioned a number of factors that made tests and exams more effective. Several commented on the importance of consistency between class lecture and discussion and what is actually contained in the test. *In the case of tests, everything that was discussed in class was on the exam.* Time was another factor that was important in effective assessment. One student noted, *She made sure that everybody was accommodated. There were a couple of us that had learning disabilities and she was very accommodating of the time, like, we would take the exam with the class and then afterwards she would set up the projector and everything in another room and give us more time.*

Some students commented on extreme difficulty with multiple choice tests, while other students strongly preferred this format. Several students agreed there was value in having options in the form of assessment. As one student described, *I had a class where you had the option of taking the multiple choice, ... you know, you can take a multiple choice or essay. You can show that you know what you know.*

### Attributes of the Instructor

In addition to effective teaching strategies and methods, a number of qualities of an effective and inclusive instructor emerged from student descriptions.

*Approachable and available.* The most common descriptors of good instructors occurring across focus groups were *approachable* and *available.* Students frequently used such phrases as *he took the time* or *she's available.* Students reported meeting with these professors before and after class, in either the classroom or in the professor's office, and often students told of being invited to these meetings by professors. One student described how helpful it was when a professor *told me that if I had any questions, don't be afraid to approach him at any time ... e-mail him, see him outside of class.*

*Focused on the subject.* The students in each group also considered clarity in the delivery of course content to be a hallmark of an effective instructor. According to several students, effective instructors explain concepts in detail, but without going off on tangents or losing sight of the main concept being discussed.

*Makes a personal connection.* Beyond setting up a warm classroom climate where students can interact, effective instructors were also described as making a personal connection with their students. One participant observed, *they're actually in the classroom and they're actually sitting there helping you ... and you can tell they're having a good time.* Another noted, *the teacher was really into what he was talking about, like really interested, and he knew a lot about it, but he was able to get down to our level, like he was a little young himself.*

*Holds challenging standards for learning.* When asked to describe the best college course they had experienced, many students said the best course was also one of the hardest. One student described a professor who *didn't give it to you, you had to learn it by yourself.* Other students described the process of really being pushed to do their best work, and the boost to self-confidence they experienced when the instructor believed they could perform at high standards.

## Implications for Practice and Planning

For systemic change to occur regarding teaching in institutions of higher learning, a confluence of factors holds promise. Excellence in teaching may well comprise an *institutional marketing tool* (Ramsden, 2003, p. x), and conversations about improved teaching are fueled by forces such as changing demographics, the expansion of educational technology, and calls for accountability (Seldin, 1995), forces that *are* characteristic of the current climate. Debates in colleges and universities about the recognition and reward system for effective instruction reflect the complexity of the process which is linked to institutional mission. Yet, according to Seldin (1995), *faculty can be taught how to improve their classroom performance* (p. 2) regardless of the type of college or university in which they work. Universal Design for Instruction offers a framework with relevance to faculty and future faculty at all stages of their careers, whether they are working as teaching assistants in their graduate training program; as assistant professors balancing the roles and responsibilities of teaching, research, and service; or tenured faculty committed to student learning and continual improvement of their pedagogical skills.

The statement of Odom et al. (2004) calls us to proceed

purposefully in gathering objective indicators about the efficacy of an instructional practice: *to date, the special education community has yet to develop systematic guidelines for specifying the types and levels of evidence needed to identify a practice as evidence-based and effective* (p. 144). These authors note that the process of gathering evidence might be viewed as a continuum, and they include the suggestions of Levin, O'Donnell, and Kratochwill (2003) for viewing a program of educational research in four stages. The first stage includes preliminary ideas, hypotheses, and pilot work, followed by the process of controlled classroom experiments and observational studies. Stage 3 would move the process of research to randomized classroom trial studies, with the final stage marked by consideration of factors leading to adoption of effective practices. While Odom and colleagues (2004) frame their comments within the context of the K-12 system and the lively debate occurring around the need for multiple scientific research methodologies, their observations have merit for other educational settings including higher education. The time is right for *all* levels of education to articulate an agenda that includes collaborative efforts to examine the application of UD to educational environments so that the history of failed practices does not repeat itself (McGuire, Scott, & Shaw, 2004).

### The Synchrony between Student Observations and the UDI Principles

As part of our systematic plan to gather empirical evidence about the validity of the UDI construct, the observations of the focus groups of college students with learning disabilities resonate with references to the Nine Principles of UDI©. Creating a welcoming classroom climate (Principle 9), delineating clear expectations (Principle 3), presenting information in multiple formats (Principle 4), offering choice in methods of assessment (Principle 2), providing frequent, formative feedback and recognizing heterogeneity in learning pace and entry level knowledge (Principle 5), exhibiting an approachable and available tone and making a personal connection (Principle 8), and espousing high standards for learning (Principle 9) were pervasive themes across the four focus groups and provide striking parallels to the Principles of UDI. Research is currently underway in analyzing the themes from interviews of award-winning college instructors who have been recognized for their outstanding teaching. The perceptions of students with learning disabilities regarding effective college instruction reported here and the instructional techniques described by outstanding college faculty as revealed in our preliminary analysis of those data also appear to be in remarkable synchrony with each other and with the principles of UDI. As such, it appears that UDI may have much to offer future efforts to improve the quality of instruction provided to college students with learning disabilities.

## Other Applications of UD

The broad concept of UD is becoming part of the public dialogue about inclusive educational practices. Its applications extend from the K-12 level to higher education to adult education. At the K-12 level, legal mandates under the Individuals with Disabilities Education Act (2004) require that students who are eligible for special education are assured access to the general education curriculum. The work of the Center for Applied Special Technology (CAST) focuses on the use of technology in teaching and learning as an approach to curriculum access particularly at the K-12 level. Grounded in Universal Design for Learning (UDL), CAST's approach emanates from the central practical premise that *a curriculum should include alternatives to make it accessible and appropriate for individuals with different backgrounds, learning styles, abilities, and disabilities in widely varied learning contexts* (Center for Applied Special Technology, 2004). With a goal of universally designed curriculum, CAST is developing and exploring digital multimedia learning tools that teachers can use in an approach to teaching that is designed to address heterogeneity in abilities and learning styles among students.

Another application of UD, Universal Instructional Design (UID), was originally proposed by Silver et al. (1998) and has been under consideration at the University of Guelph in Canada by virtue of provincial funding for a project to *undertake a study of universal instructional design (UID) principles* (University of Guelph, n.d.). In the University of Guelph's applications of UD, UID principles represent the restatement of the NCSU UD principles to relate them to educational environments. Other applications of UID are presented in a special topical issue (Pliner & Adams, 2004) with a discussion of the relationship of UID to social justice education (Hackman & Rauscher, 2004). Other authors and researchers (Bowe, 2000; Kameenui & Camine, 1998) as well as The TRACE Research and Development Center at the University of Wisconsin (http://trace.wisc.edu/about/) and the National Center for Educational Outcomes at the University of Minnesota (Thompson, Johnstone, & Thurlow, 2002) are examining the application of UD in the areas of technology and high stakes assessment.

## Recommendations

For parents and consumers including college bound students with learning disabilities, several recommendations are warranted. Contextual differences regarding services

and outcomes between the K-12 level and the postsecondary level are important to bear in mind when searching out a suitable match in college selection for students with learning disabilities. Bearing in mind the observations of students in the focus groups described in this article, attention to class size and institutional mission may be especially important in choosing a college. The increasing use of technology in college classrooms has implications for students' competencies including their efficiency in using assistive technology (AT). As recommended by Bryant, Bryant, and Rieth (2002), *learning about and trying out various technological aids should occur during high school so that students enter higher education with the requisite skills in the use of AT* (p. 428). And finally, the insights and experiences of these students reveal the importance of self-determination in thinking about the classroom learning environment and seeking out instructors who are inclusive in their teaching methods and interaction style. As one student explained, *I pick my classes by who is teaching... because it does change every semester and so if you find out who is teaching it, you can find out basically the way that they're going to run their class and some of them do it a lot better than others.*

For professionals, it is important to be aware that a flurry of UD applications is quickly emerging in educational environments and materials. Because of the intuitive appeal of Universal Design, text book publishers and others are scrambling to provide teacher training materials that promote UD strategies. It is certainly difficult to argue *against* its adoption: who would challenge an approach that anticipates diversity and proactively builds in features to accommodate the range of human diversity, whether it is applied to meet diverse needs for accessing physical spaces or diverse needs relating to learning and instruction? Comments such as *UD will address the needs of all students* or *UD will eliminate the need for special education services* are illustrative of the enthusiasm this construct is generating. Yet, research remains to be done to systematically examine the efficacy of UD as it relates to instructional practices, context differences, and educational outcomes for students with disabilities.

## Summary

This article reports in part on the ongoing and cumulative efforts underway to explore and validate the construct of Universal Design for Instruction. Formative data such as the findings of the student focus groups reported here are encouraging and lend concurrent validity to the Nine Principles of UDI©. Field-based practices and applications by college faculty on two- and four-year campuses are underway, and a variety of concurrent and outcome data collection methods are being developed, piloted, and implemented. UDI provides a framework for inclusive college instruction that is emerging as a practical and grounded approach to this intuitively appealing value system for anticipating and planning for student diversity in the college classroom.

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