Universal Design for Instruction: Extending the Universal Design Paradigm to College Instruction

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Abstract

Universal design for instruction (UDI) represents the systematic application of universal design, the construct from architecture and product development, to instructional practices in higher education. In addition to a description of the deliberative process by which UDI was developed, this article provides confirmatory evidence of the validity of this construct in its details of three studies undertaken to explore its application. Readers are encouraged to reflect upon the impact of UDI on the practice of disability services and the importance of examining its efficacy to sustain its long-term relevance.

The new millennium marks a period in higher education that is increasingly different from the decades of the 1980s and 1990s during which postsecondary disability services were evolving and expanding. Changes involve diversity among college students, a more consumer-oriented clientele, demographic trends within the professoriate, and the impact of disability legislation. These changes have implications for the profession of Postsecondary Disability Services and the goal of universal access to postsecondary education for individuals with disabilities (Association on Higher Education And Disability; AHEAD, 2005). While it may sound radical, the time has come to move the paradigm relating to instructional access from accommodation to full inclusion.

Consider these facts. The profile of students entering higher education is changing, with growing numbers of older students, first-generation college students, and minority students comprising a notable presence on campus. According to the *Chronicle of Higher Education Almanac* (2003), the 2001 demographic profile of students confirms this diversity: 40% of the student population was 25 or older; 12% more women than men were enrolled; 31% were racial/ethnic minorities; and 34% were attending college part time. In addition, there was a 20% increase in the number of international students between 1998-2000. Yet, data on outcomes raise concerns. According to a recent government study (National Center for Education Statistics, 2003), the outcomes for a cohort of first-time beginning students who were followed over a six-year period (1996-2001) warrant attention.

Twenty-nine percent of these students earned a bachelor's degree; 10% had an associate's degree; 12% received a certificate of some sort; 14% were still enrolled. Alarmingly, 35% left without a degree and/or were no longer enrolled. In an era marked by a more diverse student population as well as a focus on accountability, consumers and government agencies are posing challenging questions about why students are leaving college before completing their program of study and what efforts are underway to address student retention (Tinto, 2004).

Projections of faculty retirements in the new millennium underlie the statements regarding the changing professoriate. According to Morrison (2003), higher education is in a state of transition given that more than 20% of college and university faculty will retire within the next decade. The potential this trend may have for transforming the instructional environment is powerful. Classes will be taught by faculty, instructors, and graduate assistants who will incorporate information technologies into their teaching, and the more traditional focus on providing instruction will change to one that focuses on producing learning (Fink, 2003). At the same time, as a group today's faculty are described as "not very well prepared for their profession of teaching" often "armed with voluminous and intricate knowledge of their specialty … with little understanding of how students learn" (Cross, 1999, p. 38).

Finally, legislation including the Individuals with Disabilities Act and the Americans with Disabilities Act has heightened consumer awareness about access to col-

lege where equal opportunities and classroom accommodations are assured. Trends of increased enrollment confirm the impact of these legislative mandates. Data gathered by the American Council on Education and reported by Henderson (1999) underscore the changes that have occurred: in 1978 2.3% of first-time full-time college freshmen indicated they had a disability; by 1998, that figure had risen to 9.8%. Yet, despite legal protections, for some of these students there continue to be "formidable physical and learning barriers: students with disabilities encounter significant challenges of physical accessibility and access to curriculum and instruction" (Pliner & Johnson, 2004, p. 106). This is particularly the case for students with cognitive disabilities by virtue of the intersection of the manifestations of learning, attentional, and other cognitive disorders and components of the instructional process.

Recognizing that historically the needs of students with cognitive disabilities in postsecondary settings have been approached via legal mandates for nondiscriminatory treatment, we are proposing a different paradigm or model that is timely in light of changes in the current climate of higher education. This model, universal design for instruction (UDI), shifts the focus from retrofitting accommodations to instruction (e.g., making arrangements for copies of notes *after* a student self-identifies as having a learning disability and needing such) to proactively planning for instruction that anticipates diversity in learners. UDI is a framework built upon the foundation of universal design (UD) and its principles and comprises a value system that offers intriguing possibilities for faculty development as well as collaborative partnerships between instructors and postsecondary disability service providers.

Universal Design

Often, change is brought about by the articulation of a value system with principles regarding a phenomenon's intrinsic worth or desirability (Merriam-Webster, 1995). UD emanated from a value system that espouses the responsibility of architects and designers to consider human diversity in the design of products and spaces, resulting in environments and goods that are usable by the intended audience: the diverse public (Welch, 1995; Wilkoff & Abed, 1994). The Center for Universal Design at North Carolina State University has developed a set of seven principles to guide designers as they create accessible spaces and products. These principles, regarded as seminal in the field of UD (Adaptive Environments Center, 2000; Follette Story, Mueller, & Mace, 1998; Null & Cherry, 1996), serve as tools to facilitate

design features that benefit a broad range of users and are built in rather than added as an afterthought. The value system of universal design, while not originating specifically to address access issues in higher education, clearly interfaces with the value system of our profession: to promote full participation and universal access for persons with disabilities in higher education (AHEAD, 2005).

The notion of the fit between the concept of UD and instruction in higher education was initially introduced by Silver, Bourke, and Strehorn (1998), who used the term universal instructional design, "which places accessibility issues as an integral component of all instructional planning" (p. 47). Their exploratory work provided data from a focus group of faculty who offered insights into some of the challenges of instruction for diverse learners as well as some of the benefits of more universally designed classroom approaches. Combining the paradigm or model of UD and its seven principles with a value system that embraces learner diversity in an era of changing demographics has led to the articulation, application, and exploration of UDI. In this article, we present the rationale for the UDI approach and the process by which the concept has been developed at the University of Connecticut, including studies that address the validity of the concept. Implications for postsecondary disability service providers and future directions are also presented.

Universal Design for Instruction

Recognizing that the application of UD to higher education instruction must be approached with thoughtful attention to the primary users of UDI, college faculty, activities in the development of UDI were consistently planned and implemented with the perspective of this audience in mind. By virtue of two federally funded projects from 1999 to 2005 under the U.S. Office of Postsecondary Education, the process of defining, developing, and disseminating UDI and its products and materials proceeded with conscious efforts to seek faculty input and recommendations.

What Is Universal Design for Instruction?
UDI comprises a framework for faculty to use in planning and delivering instruction and assessing of learning outcomes. The underlying premise is a value system that embraces heterogeneity in learners and espouses high academic standards (McGuire & Scott, 2002) with the belief that faculty who anticipate diversity can intentionally build inclusive instructional approaches into their teaching. Just as the seven principles of UD comprise tools to assist designers in their work, the nine principles

of UDI© (Scott, McGuire, & Shaw, 2001) comprise a flexible foundation to guide faculty in course design and delivery.

UDI is not viewed as a "quick fix" for ensuring inclusive instruction. Rather, it is a tool that integrates the usability features of UD with research about effective instructional strategies. The intent of UDI is to guide faculty in the process of reviewing their approach to teaching and refining instructional strategies and methods in recognition of the needs of diverse learners with diverse experiences. Neither does it purport to represent a radically new way of teaching. The intuitive appeal of UDI rests on the fact that its principles embody elements of research and practice on effective approaches to enhance learning. Results of validation studies of UDI that are described in this article confirm that many faculty who are recognized as outstanding teachers already incorporate elements of UDI into their craft although they are not explicitly calling it that.

Who Is the Audience for UDI?

While approaches to disability services are expanding now to include collaborative strategies with faculty around instructional access, the primary audience for UDI is clearly faculty. With changes in the demographics of college learners that include more students with nonvisible cognitive disabilities come both challenges and opportunities for faculty who, according to Seldin (1995), "must learn to gear instruction to a new classroom dynamic" (p. 4). Yet, there is no unified approach to faculty preparation or ongoing professional development that includes preparation for teaching students with diverse learning needs. Extending the UD paradigm to instruction in postsecondary settings must be carefully examined in light of features that distinguish the instructional milieu of college classrooms from other educational venues.

Unique elements of instruction at the college and graduate school levels differentiate it from instruction in the K-12 system, where teachers must be certified and generally maintain their knowledge and skills through professional development initiatives. Thus, classrooms in the K-12 system include teachers and paraprofessionals with specific responsibilities and training in working with diverse learners. In contrast, faculty are content experts, not experts in pedagogy. Historically, an effect of the reward system for faculty that stresses research and scholarship has been to minimize the importance of teaching and ways to improve it (Seldin, 1995). In contrast to elementary and secondary settings where students with disabilities are assured of access to the general education curriculum as regulated through state education codes,

curricula and courses in postsecondary settings vary dramatically across different postsecondary settings (Morelli, 1999). There is no mandate for students with disabilities for a free, appropriate postsecondary education. Colleges are not required to alter technical standards, and students must maintain their eligibility by meeting criteria for academic performance.

Yet, there are indicators that the climate in higher education is changing. Pressure for accountability from diverse sources such as the American Association for Higher Education, state legislatures, and students underscores the importance of teaching. Greene (1995) has observed that traditional methods of teaching are being challenged more often and with more hostility. A confluence of factors is creating opportunities for proactively designing approaches to college instruction that incorporate flexibility, have relevance regardless of content, and are responsive to learners with divergent learning styles and experiences. UDI is such an approach, promoting faculty autonomy in the instructional planning process and respecting the expertise of the professoriate. With an absence of legal mandates relating to planning individualized instruction for students with disabilities at the postsecondary level, change will be fueled by thoughtful approaches that are responsive to the culture of faculty and features of their work that are distinctly different from those of their colleagues in elementary and secondary settings. Faculty development research by Ambrose (1995) offers key clues to factors that are critical for the success of efforts to improve college teaching, including: (a) start slow to build credibility and trust; (b) enlist the support of key administrators and faculty about the importance of teaching; (c) understand the culture of the institution; and (d) identify a model for developing and changing teaching behavior that includes theory, practice, and feedback. It is the latter factor that captures the essence of UDI.

With faculty as the audience, a current climate for change based upon diversity and accountability, and indicators of effective approaches to faculty development, the UDI construct, an application of the UD paradigm, holds promise for empowering faculty and future faculty to refine their instruction to make it more inclusive and responsive to students with disabilities.

The Process for Developing UDI

The paradigm of universal design served as the theory base for our work. Applying this to college instruction, awareness of and anticipation of student diversity would guide the design of inclusive college instruction. As college faculty ourselves, we knew that an extensive body

of research already existed on related areas of effective teaching, diverse learners, and higher education, though little of this information had been cross-referenced and applied at the college level. In addition, making this information available in a format that would be usable by faculty in diverse disciplines, at varying types of campuses with different missions pertaining to instruction, and in different stages of career development, was a critical variable in establishing a credible base for proposing a model for college instruction.

Literature-Based Principles

The seven principles of universal design developed by the NCSU Center for Universal Design (*see lead article in this special issue for these principles)* are widely acknowledged and cited as seminal for guiding practice in the field of UD (Follette Story, et al., 1998; Universal Design, 2000). The principles delineate considerations for the "usability of an environment" based on a broad spectrum of human abilities, including vision, hearing, speech, body function, mobility, and cognition. We an-

Table 1

Research-based Recommendations for Effective Instruction and Universal Design

Authors	Title	Source	Target audience: College Students	Explicitly includes disabilities	Recommends inclusive teaching practices
Chickering & Gamson, 1987	Seven principles for good practice in undergraduate education	American Association of Higher Education, Washington, DC (ERIC Document Reproduction Service No. ED282491)	Yes	No	Yes
Chickering & Ehrmann, 1996	Implementing the seven principles: Technology as lever	Available at: www.tltgroup.org/programs/seven.html	Yes	No	Yes
Kameenui & Carnine, 1998	Universal access principles for designing curriculum	*Effective teaching strategies that accommodate diverse learners*, Upper Saddle River, NJ: Prentice Hall	No	Yes	Yes
Swanson & Hoskyn, 1998	Experimental intervention research for students with learning disabilities: A meta-analysis of treatment outcomes	*Review of Educational Research, 68* (3), 277-321	No	Yes	Yes
Center for Applied Special Technology, 2002	Three essential qualities of universal design for learning	Available at: www.cast.org/udl	No	Yes	Yes
Center for Universal Design, 1997	Principles of universal design	Available at: www.ncsu.edu/ncsu/design/cud/index.html	No	Yes	No

ticipated that many features of UD would be applicable to the college classroom but that research on teaching and learning would allow us to expand the paradigm in the areas of cognition that could guide college instruction.

An extensive literature review was conducted focusing on research and publications related to universal design, effective instruction in higher education, and effective instruction of students with learning disabilities in both secondary and postsecondary educational settings. We included the area of learning disabilities because students with learning disabilities (LD), by definition, represent a broad range of learning and cognitive differences that often challenge traditional notions of college instruction. (For more detailed information on the literature review process, see Scott, McGuire, & Foley, 2003.)

As a result of the literature reviews, numerous research articles were identified in each target area. Most useful for the purpose of examining existing knowledge bases across multiple areas of research were meta-analyses and articles that provided syntheses of findings across studies and were widely cited as authoritative in their respective fields. In each of the designated target areas, seminal articles emerged in which the authors had culled the research and provided recommendations for practice based on this body of work (see Table 1). While each body of literature contributed insights into aspects of inclusive teaching with diverse learners in the college environment, no single source encompassed student diversity (including students with disabilities), inclusive teaching practices, and the specific context of college instruction. Therefore, we drew on elements of each seminal article.

In keeping with the intentional use of UD as the theory base for this work, the original seven principles of UD (Center for Universal Design, 1997) served as the foundation for universal design applied to instruction (UDI) and were modified to infuse elements from educational research on learning and effective instructional practices. Each of the seven principles of UD was found to have relevant applications in the instructional environment. However, based on critical variables that emerged from the literature on college teaching, two new areas were identified as essential to inclusive instructional environments that were not reflected in the existing seven principles of UD: (a) consideration of the social interaction and community involved in instruction and (b) the importance of the instructional climate for learning. As a result, two new principles (Principle 8, Community of Learners; and Principle 9, Instructional Climate) were incorporated into the UDI framework. Definitions for each of the nine principles were subsequently reviewed and revised to reflect both UD and educational research. As a result of this process, the Nine Principles of UDI© (Scott, et al., 2001) were articulated.

In order to examine the face validity of the nine principles, we sought input and feedback from several sources. As part of a three-year federal grant funded through the U.S. Department of Education (DOE), Office of Postsecondary Education (OSD), the nine UDI principles were reviewed by experts in instruction in higher education, faculty with acknowledged teaching excellence, and individuals with expertise in instruction of diverse learners, including college students with learning disabilities. Faculty, administrators, and OSD personnel from both two and four-year institutions reviewed the principles for relevance, clarity, and comprehensiveness (see McGuire, Scott, & Shaw, 2003, for more detail on this process). After incorporating this expert feedback into the revision of the principles, they were further reviewed by the Center for Universal Design at NCSU for feedback on the "goodness of fit" regarding how well the UDI principles maintain the integrity of the original seven universal design principles. The final version of the Principles of UDI© derived from this literature foundation and expert review process are provided in Table 2.

Ongoing Validation and Theory Building

Building on the existing literature bases in universal design and effective educational practices is an important starting place in articulating principles for inclusive instructional practices at the college level. However, the process of defining and establishing a theoretical foundation is essential for grounding exploration of the UD paradigm in college instruction. Pedhazur and Schmelkin (1991) noted that "to be scientifically meaningful, a concept, or a construct, has to be part of an implicit or explicit theoretical framework that explicates its relation with other concepts" (p. 166). Attention to theory allows the field to build on the extensive existing knowledge bases pertaining to instruction and learning, articulate explanatory models and ask questions about effectiveness (Dubin, 1969). Given the strong intuitive appeal of UD and the disability field's enthusiastic interest in UD applications, attention to the process of theory development is timely and important for the rigorous exploration of UDI.

As part of developing and grounding the theory base for UDI, a series of construct validation activities are underway. By examining key perspectives on inclusive instruction in the field, we have access to another lens for viewing the adequacy and comprehensiveness of the UDI principles. Three field initiatives are briefly described: student focus groups, outstanding teaching fac-

Table 2

Principles of Universal Design for Instruction[©]

Principle	Definition
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.
Principle 2: Flexibility in use	Instruction is designed to accommodate a wide range of individual abilities. Provide choice in methods of use.
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.
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.
Principle 5: Tolerance for error	Instruction anticipates variation in individual student learning pace and prerequisite skills.
Principle 6: Low physical effort	Instruction is designed to minimize nonessential physical effort in order to allow maximum attention to learning. Note: This principle does not apply when physical effort is integral to essential requirements of a course.
Principle 7: Size and space for approach and use	Instruction is designed with consideration for appropriate size and space for approach, reach, manipulations, and use regardless of a student's body size, posture, mobility, and communication needs.
Principle 8: A community of learners	The instructional environment promotes interaction and communication among students and between students and faculty.
Principle 9: Instructional climate	Instruction is designed to be welcoming and inclusive. High expectations are espoused for all students.

Source: *Principles of Universal Design for Instruction*, by Sally S. Scott, Joan M. McGuire, and Stan F. Shaw.

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ulty, and inclusive faculty.

Student focus groups. One group of stakeholders in the process of examining inclusive college instruction is students with cognitive disabilities. In order to gain insight into these students' perceptions of effective instruction and inclusive college classrooms, a series of four focus groups was conducted. The objective of each focus group was to determine the students' perceptions of (a) what constitutes a positive college course, (b) instructional strategies and methods employed by professors that

enhance student learning, and (c) barriers to learning.

The focus groups included 23 students with LD and other cognitive disabilities (attention deficit hyperactivity disorder [ADHD], psychological) 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. Focus groups were audio taped, and transcripts

were subsequently, examined for emergent themes across the sites. (For a more detailed description of the study, methodology, and data analysis procedures, see Madaus, Scott, & McGuire, 2003a; McGuire & Scott, in press.)

Results of the study indicated that while students mentioned barriers and challenges, they also 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 LD and other cognitive disabilities have experienced inclusive college classrooms.

Effective teaching methods and strategies were identified across the groups; they included such approaches as establishing clear expectations, providing advanced organizers, presenting information in multiple formats, giving frequent formative feedback, and using diverse assessment strategies. Affective elements of the classroom were also deemed important, as reflected in a welcoming classroom climate, connecting academic content with real-life experiences, and providing support for individual learning needs within the larger group context. At times, this individual support was related to the student's LD. One student described a professor who wrote personal notes such as, "I understand where this could possibly be 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. For example, 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."

Attributes of the instructor were equally important to these students. Excellent instructors were noted as being approachable and available, focused on the subject, and able to make a personal connection with students. Excellent instructors also created a challenging standard for learning. One student described a professor who "didn't give it to you; you had to learn it by yourself." Other students related the process of 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.

The students in these focus groups were not familiar with the Principles of UDI©, and did not speak in terms of the principles. Yet, their observations resonate strongly with the UDI framework derived from the literature. Re-current references to such instructional features as clear expectations (Principle 3), multiple formats of material (Principle 4), and frequent formative feedback (Principle 5) provide striking parallels to the Principles of UDI©. Further, explicit mention of the importance of a welcoming environment and personal connection with faculty and other students supports the addition of Principles 8 (Community of Learners) and 9 (Instructional Environment) to the UDI framework. Therefore, the results of this study provide strong evidence of concurrent validity between student perceptions of inclusive instruction and the literature derived Principles of UDI©.

Outstanding teaching faculty. Another group of stakeholders important in examining inclusive college instruction is college faculty. To that end, individual interviews were conducted with faculty at the University of Connecticut who are recognized as outstanding college teachers. It was hypothesized that this group of faculty would provide insight into creative and innovative approaches to reaching a broad range of college learners. The objectives of the interviews were to gather faculty perceptions about the presence of student diversity in the classroom, gain insight into effective and recommended instructional strategies, and learn about professional development opportunities that have been useful for these outstanding teachers.

Individual interviews were conducted using an open-ended interview process with 18 faculty members designated as University Teaching Fellows. This recognition is one of the highest honors conferred upon faculty at the University of Connecticut and is an acknowledgment of exceptional college teaching based on student and colleague nomination and input. Interviews were recorded, transcribed, and subsequently examined for themes. Participants consisted of 11 males and 7 females, representing a broad range of academic disciplines, including engineering, biology, art history, physics, mathematics, accounting, plant science, education, psychology, and family studies. (See Madaus, Scott, & McGuire, 2003b, for a more detailed description of the study.)

Analysis of the interviews revealed that these outstanding college teachers had observed a growing diversity in the college student population and were using a variety of instructional strategies and approaches in their divergent disciplines and classrooms as a result. On the topic of *effective instructional strategies*, several themes emerged across participants. Frequently mentioned was the importance of providing explicit structure (for example, ensuring clarity in assignments, providing steps for completing an activity, reviewing written class policy on areas such as attendance and makeup exams). Strategies for actively engaging students in learning were also

viewed as important (for example, discovery-and problem-based learning, use of case studies, real-life examples). Redundancy of important points was emphasized as a means of reaching many students (for example, providing key points through multi-modal methods of presentation, having students discuss recurring themes across a course, engaging in learning through a series of individual, group, and online activities). Finally, many faculty members emphasized the importance of teaching productive study and learning strategies (for example, notetaking for the specific discipline, reading the text effectively, and how to study for and perform well on the exam).

The faculty in this study were also very attuned to the importance of climate in the classroom and spoke of the value of *creating a positive learning environment*. As one faculty member noted, "So, as far as any student, any learning situation, is concerned, it's how the faculty want to work with those students, how they interact with them. The fact that they show them that they are there for their benefit will help students learn." Another faculty member stated, "I include everybody in the discussion. I work at that very hard. It's something that I always pay a lot of attention to, setting the tone of the class in the first few weeks." Establishing high expectations for student performance, promoting a safe environment for participation, and the use of humor were frequently mentioned as important to the affective elements of learning.

Once again, the findings from this study suggest many parallels to the UDI framework. These include considering equitable access and participation in class discussion (Principle 1), making structures and expectations explicit (Principle 3), teaching productive learning strategies within the discipline (Principle 5), and using humor to connect with students (Principle 8), among many others. Though none of the participants had been exposed to the construct of UDI per se, the instructional practices and methods these outstanding teachers had found effective with a broad range of learners provide additional support for the construct validity of the literature based Principles of UDI.

Inclusive college teachers. Continuing with the process of construct validation, we are expanding the exploration of inclusive instruction from a field perspective. Thus, in a study currently underway, "inclusive" faculty are the focus of research. College students with a broad range of disabilities (including cognitive and other disabilities) have nominated faculty they have found to be inclusive in the classroom. These participants will be individually interviewed to gain their perspectives on college instruction. Similar to the study of outstanding college teachers, the objectives of this study are to gather faculty perceptions about the presence of student diversity in the classroom, gain insight into effective instructional strategies, and learn about professional development opportunities that have been useful for these faculty who students experience as inclusive teachers in the classroom.

In summary, each of the three field-based studies-the student focus groups, the outstanding college teachers, and the inclusive faculty— provides a source for considering the concurrent validity of the principles of UDI. Results of the studies completed to date are affirming of the validity and relevance of UDI in college instruction. Juxtaposing or triangulating the findings from all three studies will provide rich data and a better understanding of the elements of inclusive college classrooms.

Implementation Initiatives

Welch (1995) noted that the development of critical practice and projects documenting exemplars are important to the development of grounded theory. In addition to the validation procedures relating to the UDI principles, a major focus of the federally funded UDI project has been the establishment and support of UDI learning communities, a forum for critical dialogue and exploration regarding the UDI principles. UDI learning communities consisting of faculty, administrators, and OSD professionals were established on five campuses – two community colleges, two four-year liberal arts institutions, and one very competitive private university. (See the Facultyware website at http://www.facultyware.uconn.edu/ community.cfm for more information on these communities.)

The UDI learning communities provided a context for dialogue among participants from diverse academic disciplines about mutual interests in student diversity and inclusive teaching. Some learning communities identified a primary focus for group discussion (e.g., developmental education classes, instructional technology). Each of the groups structured regular communication and/or meeting opportunities (e.g., monthly brown-bag lunches, group discussion board) over approximately a one-year period to examine and discuss the UDI principles and their applications in diverse college settings and classrooms. Participants used the UDI principles to inform their own instructional practices as well, and many revised an instructional approach or developed a new strategy to meet the needs of diverse learners in their classes based upon one or several of the principles. Many of these inclusive practices are published on the Facultyware website (http://www.facultyware.uconn.edu/ freeware.cfm) as part of the instructional freeware that is available to any visitor of the site who is interested in

learning more about these inclusive instructional activities and approaches. All published instructional strategies have been peer reviewed and found to be of high quality and usability at the college level, and reflect one or more of the UDI principles.

Future Directions for OSD Professionals

Theory development of UDI is well underway, a critical element for any initiative that seeks to advance a new approach or idea. Literature-based principles corroborated by content experts, field-based practices, and exemplars developed by faculty all provide strong and growing support for a theoretically grounded approach to inclusive college instruction. These efforts are essential, especially when the primary audience for UDI is faculty who are inquisitive and often faced with competing institutional values (e.g., research and publications for promotion and tenure) that can affect their commitment to the improvement of their teaching (Pastore, 1995).

What will the UDI paradigm mean for OSD professionals? A growing cadre of faculty who are attuned to the needs of students with disabilities and are prepared with an inclusive framework of principles for examining and refining instruction has the potential to modify our daily work. Perhaps fewer students will require notetakers as faculty provides online copies of their notes to all members of the class. More students may be given options in how their learning is measured, resulting in fewer traditional approaches to assessment such as multiple-choice exams requiring extended time, quiet testing room, or alternate format. When selecting a textbook for a course, faculty may give priority to texts that are provided in electronic as well as hardcopy format by the publisher, reducing the need to scan or record texts. UDI will never eliminate or override the importance of the OSD for monitoring and ensuring the civil rights of students with disabilities on campus, but it has the potential to change the nature of our work.

In a focus group study of OSD professionals, Embry, Parker, McGuire, and Scott (2005) gathered perspectives on UDI and perceived implications for professional practice. Participants noted that the widespread adoption of UDI across campus might result in more time for non-mandated tasks such as strategies instruction and data collection. They also posited that UDI would foster new collaborative relationships with faculty and instructional design staff on campus. Several participants pointed out that promoting strategies for teaching a broad range of diverse learners would be perceived positively by many campus constituencies. Yet, despite these potentially positive changes, participants noted they would need strong administrative support from leaders and influential groups on campus to make this a reality.

Change can be a disquieting process, or it can be a catalyst for creativity. Proposing an inclusive approach to college teaching, UDI, that espouses a value system that embraces diversity in learners and proactively plans for learner needs represents a change from the tradition of information dissemination via the lecture format that has characterized higher education (Fink, 2003). This paradigm shift may also have an effect on elements of disability services, which, historically, have rested on legislative bedrock. According to Shoemaker (1998), three sequential steps comprise elements of the change process: (a) the invention or innovation (e.g., UDI); (b) dissemination of information about the innovation (e.g., manuscripts such as this and others referenced herein); and (c) consequences. As the field of disability services embraces the construct of UD and innovation in its applications, it is critical that research efforts proceed in a deliberate manner to answer questions about impact. Both OSD professionals and faculty must be informed consumers as the field undertakes this important change process.

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