

INCLUSIVE COLLEGE TEACHING: UNIVERSAL DESIGN FOR INSTRUCTION AND DIVERSE LEARNERS

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Abstract: Shifts in enrollment patterns are affecting college classrooms and elements of teaching ranging from options for delivering course materials online to multiple methods of assessing learning. With the enrollment of more diverse college learners comes a call to intentionally design instruction that is more inclusive and responsive to multiple learning styles. The notion of Universal Design for Instruction (UDI) is examined from its roots in the architectural field to its application as a model for teaching that anticipates diversity including students with disabilities. Principles of UDI are defined, and pedagogical examples are provided. Several implementation projects based on the UDI concept are described as are preliminary results regarding outcomes. Substantive issues are identified that have bearing on the direction this innovative idea will take over the next several years.

Keywords: universal design for instruction (UDI), inclusive college teaching, diverse college students, inclusive instruction, universal design.

Inclusive College Teaching: Universal Design for Instruction and Diverse Learners

Postsecondary colleges and universities in the United States are becoming more diverse with respect to ethnicity, enrollment status (i.e., fulltime, part-time), students with disabilities, and number of reentry and transfer students. The implications of these changes are notable for faculty and instructors who are committed to creating inclusive learning environments. By anticipating diversity and intentionally designing instruction that is responsive to a range of learners, the concept of access is extended from buildings and spaces to classrooms

(traditional or virtual), laboratories, and course materials. A change in viewing instructional access for students with disabilities from a legal to a pedagogical perspective is timely in light of demographic data about their enrollment status. Postsecondary students with disabilities now comprise at least 11% of undergraduates in the U.S. (U.S. Government Accounting Office, 2009), and efforts to assure flexible instructional practices are gaining momentum often under the rubric of teaching to accommodate different learning styles (Davis, 2009; Nilson, 1998). The focus of this article is an examination of a model for college teaching, Universal Design for Instruction (UDI), beginning with an overview of its foundations in the barrier-free architectural movement to implementation in multiple settings and dissemination efforts to an emergent record of results regarding implementation outcomes.

Universal Design for Instruction: Its Genesis

In the 1970s, the social and political barrier-free and civil rights movements in the U.S. coalesced and culminated in laws that have profoundly altered the landscape of education (McGuire, 2007). Inherent in these movements were constructs of access and equity that are reflected as core values in legislation such as the Architectural Barriers Act of 1968 (PL 90-480), the Rehabilitation Act of 1973 (PL 93-112), the Education for All Handicapped Children Act of 1975 (PL 94-142)(now known as Individuals with Disabilities Act) and its amendments, the Technology Act of 1988 (PL 100-407), and the Americans with Disabilities Act of 1990 and its 2008 amendments (PL 110-325). The impact of this legislation has resulted in more students with disabilities pursuing higher education and availing themselves of legal protections that assure non-discriminatory treatment. Access to instruction is often facilitated by statutory provisions for academic accommodations (e.g., extended time on tests, note takers) that are intended to ameliorate the functional impact of a disability and to “level the playing field” without altering the essential elements of a course or program of study. Salmen (2011) has pointed out that this accessibility approach “is about compliance with regulations that protect a small percentage of the population” (p. 14).

An alternative to this legalistic model emanates from the concept of universal design. As campuses reflect greater diversity, it is imperative that the college community respond in inclusive ways. The idea of anticipating diversity and proactively planning for it is embodied in the work of Ronald Mace and his colleagues at North Carolina State University in the field of architecture and product design. Recognizing the continuum of human diversity, Mace and others articulated an approach to design that was proactive: rather than retrofitting elements (e.g., ramps, electronic door openers) for access to a building, why not intentionally design features that assure access from the beginning? The term, universal design (UD), was coined by Mace in the early 1970s and has served as the foundation for widespread design innovation, training, technical assistance, and research in the physical environment (Center for Universal Design, 2008). UD can be thought of as “the process of embedding choice for all people into the things we create” (Salmen, p. 14).

An opportunity to extend this concept from the physical to the instructional environment in colleges and universities presented itself in the late 1990s. In light of the trend toward more students with disabilities enrolling in postsecondary education and the important role faculty play in the instructional process, the U.S. Department of Education, Office of Postsecondary Education (OPE), authorized its first competition in 1999 to support “innovative grants to IHEs to improve their ability to provide a quality postsecondary education for students with disabilities” (U. S. Department of Education, n.d.). With federal support through grant funding, the Center on Postsecondary Education and Disability (2009) at the University of Connecticut began its work to develop and promote inclusive instructional methods and strategies for faculty to use in the design and delivery of course content and the assessment of learning outcomes.

Universal Design for Instruction: The Concept and its Principles

Extension of universal design from the built environment to the instructional environment, particularly at the postsecondary level, is, in many ways, a revolutionary idea. Historically, teaching in colleges and universities has followed the teaching paradigm, described by Barr and Tagg (1995) to focus on knowledge transfer from faculty providing instruction to students as passive

recipients. In the 1990s, a dramatic shift began a focus on producing learning characterized by a constructivist, inquiry-based, problem-solving, cooperative learning paradigm. King summarized this transformation in her “sage on the stage” to “guide on the side” analogy (1993, p. 30). Scott, McGuire, and Foley (2003) framed this change in emphasis within the concept of universal design posing a penetrating question: by anticipating diverse learners in the classroom and intentionally designing inclusive instruction, is it possible to create learning environments that are “usable by a broader range of students while maintaining the ‘aesthetics’ of the product, that is, “the academic integrity of the course” (p. 41)? An assumption of the authors is that faculty are content experts who can refine their pedagogical skills to enhance the instructional process (McGuire & Scott, 2006).

Anchored in the literature on universal design, effective instruction in higher education, and effective instruction for students with learning disabilities, Scott et al. (2003) identified seminal resources for practice in the areas of postsecondary instruction, learning disabilities, and universal design. These sources were examined in juxtaposition with the seven principles of UD from North Carolina State University (Center for Universal Design, 1997) as well as Chickering and Gamson’s Seven Principles for Good Practice in Undergraduate Education (1987) resulting in the concept, Universal Design for Instruction (UDI), and nine principles of practice. The definition and principles were then reviewed by experts in UD, postsecondary disability services, and effective college teaching to determine their relevance and utility for guiding faculty in the design and delivery of course content. College students with learning disabilities (LD) also provided input. With favorable feedback on the construct and principles from all constituents, the concept of UDI is defined as “an approach to teaching that consists of the proactive design and use of inclusive instructional strategies that benefit a broad range of learners including students with disabilities” (Scott, McGuire, & Embry, 2002). Building on the work of Mace and the Center for Universal Design, Scott, McGuire, and Shaw (2001) developed the nine Principles of Universal Design for Instruction®, a framework for faculty

to use as they plan and deliver instruction. Table 1 includes the principles, definitions, and instructional examples.

Table 1. Principles of Universal Design for Instruction. Source: Scott, McGuire, & Shaw, 2001.

Principle	Definition	Example(s)
<u>Principle 1:</u> 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 online. Comprehensive notes can be accessed in the same manner by all students, regardless of hearing ability, English proficiency, learning or attention disorders, or note taking skill level. In an electronic format, students can utilize whatever individual assistive technology is needed to read, hear, or study the class notes.
<u>Principle 2:</u> 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.
<u>Principle 3:</u> 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; a handbook guiding students through difficult homework assignments.
<u>Principle 4:</u> 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 online so students with diverse needs (e.g., vision, learning, attention, English Language Learners) can access materials through traditional hard copy or with the use of various technological supports (e.g., screen reader, text enlarger, online dictionary).

<p><u>Principle 5:</u> Tolerance for error</p>	<p>Instruction anticipates variation in individual student learning pace and prerequisite skills.</p>	<p>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 online “practice” exercises that supplement classroom instruction.</p>
<p><u>Principle 6:</u> Low physical effort</p>	<p>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.</p>	<p>Allowing 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 difficulties or extreme organization weaknesses while providing options for those who are more adept and comfortable composing on the computer).</p>
<p><u>Principle 7:</u> Size and space for approach and use</p>	<p>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.</p>	<p>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.</p>
<p><u>Principle 8:</u> A community of learners</p>	<p>The instructional environment promotes interaction and communication among students and between students and faculty.</p>	<p>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.</p>
<p><u>Principle 9:</u> Instructional climate</p>	<p>Instruction is designed to be welcoming and inclusive. High expectations are</p>	<p>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 to</p>

	<p>espoused for all students.</p>	<p>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.</p>
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Validation of UDI and its principles included studies with faculty recognized for their teaching excellence, students with LD and attention deficit hyperactivity disorder (ADHD), and graduate teaching assistants. Eighteen faculty from 10 disciplines (engineering, biology, family studies, mathematics, physics, accounting, art history, plant science, education, and psychology) designated as University Teaching Fellows were interviewed to gather their perspectives about effective teaching strategies (Madaus, Scott, & McGuire, 2003a). This academic recognition is one of the highest honors at the research intensive institution where the study was conducted. While these distinguished professors did not use the terminology of UDI, several themes about recommended instructional strategies resonated with the UDI principles: (a) providing explicit structure and clarity about a course, assignments, and performance expectations (Principle 3, Simple and Intuitive); (b) actively engaging students in the learning process (Principle 8, A Community of Learners); (c) teaching learning strategies useful in specific disciplines (Principle 5, Tolerance for Error) ; and (d) creating a positive learning environment with high expectations for all students (Principles 1 and 9, Equitable Use and Instructional Climate). To explore student perceptions about effective and inclusive instruction, the insights of 23 students with LD and ADHD were synthesized across four focus groups. As was the case with the outstanding teaching faculty, themes reflected the UDI principles to provide strong evidence of concurrent validity between elements of inclusive instruction and the literature derived UDI principles. Establishing clear and explicit course expectations (Principle 3, Simple and Intuitive), presenting information in multiple formats (Principle 2, Flexibility in Use), providing frequent formative feedback (Principle 5, Tolerance for Error), reinforcing challenging standards for learning (Principle 1, Equitable Use), and creating a welcoming classroom climate (Principle 9) were noted as

distinguishing features of excellent instructors (Madaus, Scott, & McGuire, 2003b). Finally, a qualitative study of five graduate teaching assistants (GTAs) explored their beliefs about inclusive teaching and how they enacted those beliefs in their teaching practice (Embry & McGuire, in press). Disciplines included mathematics, accounting, experimental psychology, and business management. Many of these GTAs' teaching practices were consistent with UDI and its principles although none of the GTAs were familiar with the concept. For example, one GTA noted that, "I try to use a variety of assessment methods to give equal opportunity to different kinds of people...some people are more comfortable with oral examination; some are more comfortable with written" (p. 13)(Principle 2, Flexibility in Use). Another shared that, "I work really hard in not putting them off with complexity...saying 'Look, it's hard. But you can do it. Everybody can do it'" (p. 12) (Principles 3 and 9, Simple and Intuitive and Instructional Climate). The authors recommend the use of UDI and its principles as a platform for GTA training. Familiarity with an explicit theoretical framework would prepare GTAs for crafting their teaching in an explicit manner that anticipates a broad range of learners and intentionally builds in methods and strategies that are responsive to diverse learning styles.

Universal Design for Instruction: Implementation and Dissemination Activities

Three 3-year grant funding cycles sponsored by the U.S. Office of Postsecondary Education have provided opportunities to apply UDI in multiple settings (for a detailed history, see <http://www.udi.uconn.edu/index.php?q=content/project-history>). During the first funding cycle (1999-2002), foundational work extended the concept of UD to college teaching resulting in the definition of UDI and articulation of UDI principles. A range of activities included the development of fact sheets regarding UDI, UDI training modules, and resources for faculty that relate to inclusive postsecondary instruction for diverse learners including those with disabilities. A web site, Facultyware (www.facultyware.uconn.edu), served as the host for a compendium of faculty "products," defined as any identifiable component of instruction used to accomplish a set of specifiable student performance outcomes. Faculty from diverse institutions (2-year, 4-year, public

and private) across the U.S. submitted examples of instructional methods that underwent a peer review process and were determined to reflect one or more UDI principles. Thirty two products developed by faculty authors who used UDI principles in their course planning, delivery, and/or assessment are posted in the Instructional Freeware section of Facultyware (see http://www.facultyware.uconn.edu/cfm_pages/published_products.cfm?PageNum_qProducts=1).

During the second funding cycle (2002-2005), the focus was on the application of UDI through learning communities of faculty who were trained on UDI and its principles, applied the concept to one or several courses, and provided feedback about professional development materials for dissemination through the Facultyware web site. Several of the products in the Instructional Freeware section are from faculty in participating learning communities. The current funding cycle (2008-2011) extends the UDI concept and principles to online and technology blended learning environments. With a focus on “faculty as designer,” the project targets electronic teaching tools (called e-Tools) that faculty can implement in their courses without requiring the support of an instructional or web design team. E-tools are defined as digitally presented materials, instructional techniques, and/or strategies that can be used or manipulated by a course instructor to proactively create a learning environment that benefits a broad range of learners. Faculty from several types of institutions are field-testing e-Tools in their online and blended courses. Feedback from faculty and students who are using the e-tool about ease of use and benefits will be posted on the project web site (www.udi.uconn.edu). To date, more than 50 e-tools and strategies are posted along with instructional guides on how to use each e-tool.

Systemic implementation activities extend beyond the scope of these initiatives at the University of Connecticut. At Longwood University in Virginia, Project LINC (Learning in Inclusive Classrooms), based on UDI and its principles, is in its final year of addressing concerns about the challenges of introductory level foreign language (FL) instruction (Scott & Edwards, 2011). This is a topic of particular relevance to students with language-based learning disabilities who

often struggle to meet FL requirements of a liberal arts curriculum. The goal of the project is to develop a portable and sustainable training curriculum to support new, part-time, and temporary foreign language instructors in inclusive classroom techniques. A foundation workshop which included information on UDI and its application was followed by monthly topical workshops to address critical concerns relating to FL instruction. Preliminary project results are presented in the next section. Another implementation project is underway at Florida Gateway College, a two year institution that is committed to working with students who do not meet minimal college-level requirements and must take developmental coursework before enrolling in the standard degree-focused curriculum. Twenty developmental education instructors have participated in a two day training workshop based on UDI (see <http://www.projectexcelprogram.com/UDI> for training materials). These instructors are meeting periodically to brainstorm about instructional strategies that reflect UDI principles, and are deliberately planning ways to integrate these strategies into their coursework. Data collection on course outcomes (grades, completion rates) is ongoing (C. Rodesiler, personal communication, September 29, 2010).

Dissemination activities regarding UDI as a framework for inclusive college instruction have been widespread. Data from the evaluation of the second OPE grant funded initiative indicated extensive outreach. “Hits” on the Facultyware site averaged more than 300,000 per year; more than 2,000 professionals had been trained in the concept of UDI at 34 national and international presentations; Google citations exceeded 300. Although a systematic monitoring protocol for dissemination activities is not operative due, in part, to funding constraints, it is reasonable to project even broader dissemination via the Internet and publication of 21 manuscripts in peer-reviewed journals. According to professional contacts and correspondence, numerous colleges have created links to the UDI web sites in their institution’s web sites, often within teaching and learning centers and disability services offices.

Emerging Evidence of Implementation Outcomes

As noted by several authors (Burgstahler, 2008; McGuire, Scott, & Shaw, 2006; Roberts, Park, Brown, & Cook, 2011), it is critical to examine the outcomes of implementing the construct of universal design to promote inclusive college teaching. The idea of universal design applied to instruction is intuitively appealing: who could disagree with the value of creating instructional environments that are responsive and sensitive to diverse learners? Yet until a more extensive research base of efficacy exists, it is premature to promote UDI or other applications of universal design as “best practices” for faculty adoption. However, preliminary results of several projects that have implemented universally designed teaching initiatives are encouraging. Using two broad measures of student outcomes, final grades and retention, Project LINC results indicate that the grades of students with and without disabilities across instructors and across languages are now similar whereas previously, fewer students with disabilities received final grades of A-C, and more received Fs. Similarly, the withdrawal rate for both groups of students is now more consistent whereas previously the withdrawal rate of students with disabilities was more than three times that of students without disabilities. The authors judiciously note that no single causative factor can be identified (Scott & Edwards), but these data suggest that faculty and instructors can modify their teaching methods to promote inclusive instruction. In a 2002-2003 project running concurrently with the first UDI initiative at the University of Connecticut, the University of Guelph conducted faculty training based upon an adaptation of the seven principles of UD from North Carolina State University (Yuval, Procter, Korabic, & Parker, 2004). Student perceptions about the effectiveness of universal instructional design affirmed positive benefits in relation to the instructional environment and student academic self-efficacy. This author is aware of several UDI based implementation projects currently in progress. Results from these projects as well as efficacy data from other postsecondary institutions examining UD based interventions may lend support for an inclusive model of college teaching: intentionally designing an instructional environment that anticipates diversity among learners and offers

choices that extend beyond accessibility, a legal concept, and promote the notion of equity. It will be important to monitor outcomes research on a regular basis recognizing the lag time between field-based research and publication of manuscripts reporting on results in refereed journals.

Discussion

Considering that the history of access to postsecondary education for students with disabilities has historically rested on the legally mandated provision of accommodations and auxiliary aids, the movement to create inclusive instructional environments that are responsive to diverse learners including those with disabilities by applying the concept of universal design is provocative and challenging. Disciplinary expertise in a content area is a hallmark of the academy, yet priorities are shifting to emphasize effective instructional pedagogy that will generate positive student learning outcomes (Fink, 2003). Extending a concept such as UD from one context, architecture and product design, to another, instructional environments, comprises an innovation defined by Rogers (2003) as “an idea, practice, or object that is perceived as new by an individual or other unit of adoption” (p. 12). Features of universal design are now commonplace in built environments, in no small part due to statutory requirements for physical access. While some may not agree that UD in education is similar to UD in the built environment (Edyburn, 2010), many share a belief that applying universal design principles in higher education classrooms is a noteworthy goal. Over the past decade, efforts to apply UD to college teaching have escalated as reflected in a sparse but growing literature about this innovative idea (e.g., Association on Higher Education and Disability, 2004-2010; Darr & Jones, 2008; Finn, Getzel, Asselin, & Reilly, 2008; Higbee, 2008; Rose, Harbour, Johnston, Daley, & Abarbanell, 2008; Schelly, Davies, & Spooner, 2011; Scott & McGuire, 2008). Rogers noted that, “Getting a new idea adopted, even when it has obvious advantages, is difficult” (p. 1). It is too soon to speculate about the trajectory of efforts to infuse universally designed instructional strategies into college teaching, but it is timely to reflect on some

of the challenges inherent in systemic change. The literature on diffusion of innovation offers food for thought. For example,

- Is there consensus at the postsecondary level that the concept of UD applied to instruction and learning is a viable construct, a mechanism for reframing disability within a classroom as a point on a continuum of human diversity?
- What mechanisms offer efficient approaches by which field-based implementation efforts grounded in UD and their outcomes can be systematically identified and reliably monitored with a goal of synthesizing results across settings?
- What are the appropriate indicators of the efficacy of UDI? Student perceptions about their learning and methods that facilitate it provide a window via self-reflection, but this presumes proficiency and insight into linking instructional interventions with personal learning attributes and outcomes. Is student performance in a course intentionally designed using the UDI framework an indicator of the efficacy of this instructional model? How will variations in students' prior knowledge and experiences be accounted for in research designs?
- When considering change from a teaching to a learning paradigm, and the critical role faculty play in this shift, are there differences in inclusive pedagogical methods according to discipline?
- Assuming a body of efficacy research on UDI, what are the process elements that are critical for promoting such an innovative approach among faculty and future faculty?

In many circles, evidence-based research is the coin of the realm. Yet, it is noted that research often appears to have limited or no impact on practice (Nutley & Davies, 2000). It behooves those of us who are practitioners, teachers, and promoters of this inclusive paradigm to proceed objectively, collaboratively, and analytically. As opined by Edyburn (2010), the stakes are such that failure to address substantive issues about an innovative idea such as UD for instruction may well lead to the passing of another education fad.

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