Universal Design and Its Applications in Educational Environments

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ABSTRACT

Universal design (UD), a concept from the field of architecture, is increasingly evident in discussions of approaches to enhance educational access for students with disabilities. Several emerging models of educational applications of UD—Universal Design for Learning, Universal Design for Instruction, and Universal Instructional Design—are discussed, with a call to the field for a collaborative approach to examine the efficacy of applications of UD to educational environments. Several critical areas for a research agenda are articulated, with caveats that the promise of UD for enhancing access not be undermined because of premature promotion of the concept before its validity is thoroughly examined.

T HE EDUCATION OF STUDENTS WITH DISABILITIES has faced increasing scrutiny in the 21st century. In *Rethinking Special Education for a New Century*, the authors bluntly stated, "Special education is broken for too many children" (Finn, Rotherham, & Hokanson, 2001, p. 337). They went on to note that "if we did a better job of preventing and forestalling education problems, rather than relying on compensatory and remedial activities, disabled children would benefit enormously" (Finn et al., 2001, p. 337). In a similar vein, the No Child Left Behind Act (2001) reported disappointing educational outcomes for many students with dis-

abilities. Problems include low academic performance, high dropout rates, and poor postschool outcomes (National Council on Disability, 2003). Not surprisingly, there are problematic postsecondary outcomes as well, including failure to obtain meaningful employment, lower participation rates in postsecondary education, and insufficient preparation for the demands of postsecondary education (Horn, Berktold, & Bobbit, 1999; U.S. Department of Education, 2000).

Major reform initiatives over the last quarter-century intended to improve outcomes for these students have shown a trend toward greater integration of students with disabilities into general education. We have seen this movement evolve from least restrictive environment to the Regular Education Initiative to full inclusion and, finally, toward access to the general education curriculum. In his review of the development of inclusionary policy, Kavale (2002) questioned how inclusion has come to dominate educational decision making based on ideology, when research evidence has demonstrated "that the necessary attitudes, accommodations, and adaptations are not yet in place in general education to provide students with disabilities an appropriate education" (p. 201). It has been suggested that one strategy to effectively integrate individuals with disabilities might be to "universalize disability policy" (Scotch, 2000, p. 10) by formulating more inclusive educational policy agendas. Zola (1989) asked us to consider how interventions that assist people with disabilities could productively be applied to the general population. Uni-

versal design has been proposed as an example of an approach that can successfully promote inclusionary policy.

CALLS FOR A NEW PARADIGM

The report of the President's Commission on Excellence in Special Education (U.S. Department of Education, 2002) suggested that teachers from general and special education instructional systems should work together to provide effective instruction and to ensure that students with additional needs benefit from strong teaching and instructional methods provided through general education. The commission specifically recommended "that all measures used to assess accountability and educational progress be developed according to principles of universal design" (U.S. Department of Education, 2002, p. 27). In analogous fashion, the *New Freedom Initiative* (2001) suggested that a key component to providing inclusive instruction was "increasing access to assistive and universally designed technologies" (p. 3). At a recent national disability policy forum, the participants noted the need to establish universal design of facilities, technology, and instruction. "Participants believed that an emphasis on universal design would create ready access to all people, with or without disabilities" (National Capacity Building Institute, 2002, p. 46). Parents are already identifying universal design as "an increasingly popular approach" that can help all students (Casper, 2003). The belief is that universal design may be the paradigm that can promote the effective implementation of inclusion and provide access to the general education curriculum. Similarly, at the postsecondary level, there is a perception that universal design can offer access to an increasingly diverse college student population, including more "otherwise qualified" students with disabilities who will need fewer modifications and accommodations because inclusive features have been built into classroom instruction and environments (Brinckerhoff, McGuire, & Shaw, 2002).

Universal design (UD) is, therefore, becoming part of the public dialogue about inclusive educational practices. In the recently passed Individuals with Disabilities Improvement Act of 2004, references to universal design include the definition from the Assistive Technology Act (Section 602 (35)); requirements to support the use of technology based on UD principles to maximize accessibility to the general education curriculum (Section 611 (e)(2)(C)(v)); and the use of UD principles in developing and administering districtwide and alternative assessments (Section 612 (a)(16)(E)).

Most professionals understand that universal design applied to the physical environment (e.g., curb cuts, automatic doors) has resulted in more usable buildings and spaces for diverse individuals, including those with disabilities. But what is universal design in instruction, curriculum, or assessment? How can the calls for universal access from legislative language, policy forums, and parents be addressed in a responsible and rigorous manner? This article will examine the concept of universal design across educational applications. A synthesis of initiatives based on the concept of UD will promote understanding of its current and emerging applications in educational environments and provide a framework for professional dialogue and discussion. We are guided by the counsel that an "incremental approach to positive change, based on a substantive real-world empirical research foundation, offers the possibility for more rational and credible solutions" (Kavale & Forness, 2000, p. 288). Therefore, research considerations will be discussed with the intention of moving UD from an intriguing and publicly appealing concept to a potentially validated approach to inclusive educational practices. In an era marked by an emphasis on evidence-based practice and outcomes (Graham, 2005), it is critical that the field of special education continue to assume a leadership role in examining innovative approaches to educational access suggested by a UD paradigm. This discussion begins with the question, What is universal design?

ORIGINS OF UNIVERSAL DESIGN

More than 30 years ago, Ronald Mace, an architect and wheelchair user, proposed the revolutionary idea that physical environments should be proactively designed to meet the needs of the broadly diverse individuals who access these spaces (Wilkoff & Abed, 1994). In contrast to the prevalent view of disability as an anomaly to design practice and aesthetics, Mace suggested that design fields such as architecture, landscape, interior, and product development realistically examine the needs of diverse consumers (e.g., young people, elderly people, individuals with temporary and permanent disabilities) and use this enhanced awareness to inform product design that is more functional to a broader range of people. The term *universal design* (UD) was coined to reflect this approach of proactively incorporating inclusive design features while minimizing the need for individual, retrofitted accommodations (Center for Universal Design, 1997).

As the notion of UD evolved, Mace and his colleagues at the Center for Universal Design at North Carolina State University (NCSU) defined UD as "the design of products and environments to be usable by all people to the greatest extent possible without the need for adaptation or specialized design" (Center for Universal Design, 1997, para. 1). Seven guiding principles were extrapolated from inclusive design practices (Center for Universal Design, 1997) and refined to train future and current professionals in this approach to incorporating inclusive design features. Examples of universally designed products and environments are increasingly common in our lives: captioning on television sets (useful for individuals with hearing impairments, but also helpful to many individuals in a noisy setting such as an airport or restaurant); curb cuts (useful for wheelchair users, but also accessed by individuals on skateboards, parents pushing baby

strollers, etc.); universal symbols that communicate function, such as restroom signage (helpful to individuals who have difficulty reading, but also functional for non–English speakers). A common observation about universally designed products and environments is that they result in a more functional environment or product for *everyone*. As noted by Welch (1995),

> The concept of UD goes beyond the mere provision of special features for various segments of the population. Instead it emphasizes a creative approach that is more inclusive, one that asks at the outset of the design process how a product, graphic communication, building, or public space can be made both aesthetically pleasing and functional for the greatest number of users. (p. iii)

Today, work in the application of UD to physical environments continues to evolve and progress, as visionary leaders provide professional training, conferences, design competitions, and Web site resources to promote the development of UD practices in the physical realm (e.g., Adaptive Environments, 2004; Universal Design Network, 2004). It has been astutely observed, however, that the emergence of UD in architecture and design fields has not occurred in isolation (Adaptive Environments, 2004; Center for Universal Design, 1997). Changing demographics, such as an aging population and improved survival rates resulting from enhanced medical care, have led to an increasing number of consumers who may be functionally limited by age or disability. Federal legislation of the last 3 decades (e.g., Americans with Disabilities Act, 1990; Fair Housing Amendments Act, 1988; Individuals with Disabilities Education Improvement Act, 2004) has resulted in enhanced awareness of disability rights and a broad range of access needs. An increasingly global economy fosters a more diverse consumer base, raising awareness levels about differences in culture, language, customs, and experiences. Advances in technology have opened many doors and made flexible communications more feasible (e.g., audio, visual, and text communication that is instantaneous and widely available). As observed by professionals at the Center for Universal Design (Follette Story, Mueller, & Mace, 1998), "the demographic, legislative, economic, and social changes that brought us to this point are increasing the momentum that will propel us into a 21st century that will need to be more accommodating of individual differences. Universal design provides a blueprint for maximum inclusion of all people" (p. 13).

UD has framed an approach to physical domains that emphasizes design features that are more usable to the diverse public. This paradigm represents a pragmatic approach to the development of more marketable products for consumers. Yet this approach has also been termed a value system and part of a larger movement in architecture encompassing the "politics of inclusion and wholeness" (Welch,

1995, viii). UD is not a euphemism for accessibility, as access features such as ramps and lifts are "potent symbols of separateness" (Welch, 1995, p. 2). Rather, UD is a "process of exploring how a politically mandated and socially desirable value can be embodied by the design disciplines" (Welch, 1995, p. 262).

From the pragmatic beginnings of operationalizing the commonsense idea that building in inclusive features is preferable to retrofitting changes, UD has provided tangible examples of the power of embracing inclusive design practices. At a fundamental level, UD has captured and illustrated an elusive element of inclusion: the anticipation and acknowledgment of human diversity as the norm. The potential of this socially desirable value has begun to reverberate across a variety of contexts as new applications of the concept of universal design are beginning to emerge. Educators are considering and exploring provocative parallels that may be informative in efforts to design inclusive education.

UD AND ITS EDUCATIONAL APPLICATIONS

Given the relative recency of the concept of universal design, the intense interest shown by the education community in its applications to instruction speaks to its intuitive appeal. Three emerging theoretical models describing approaches to UD in educational environments are examined. Other applications of UD are also described, with the recognition that this review is intended to be illustrative, not exhaustive.

Emerging Models of Educational Applications of UD

The process of defining and establishing a theoretical foundation is essential for grounding the exploration of the UD construct in educational environments. Kaplan (1964) observed that "theory puts things known into a system. . . . It also sets forth some ideas of the rules of the game, by which the moves become intelligible" (p. 302). Pedhazur and Schmelkin (1991) have 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, to articulate explanatory models, and to ask questions about effectiveness (Dubin, 1969). Given the strong intuitive appeal of UD and the early public and legislative interest in UD applications, attention to the process of theory development is timely and important for the rigorous exploration of UD in educational settings.

Universal Design for Learning. In 1998, a topical brief was published with the intent "to increase the awareness of universal design principles for curriculum development"

(Orkwis & McLane, 1998, p. 4). Orkwis and MacLane discussed the background of universal design and described efforts to expand the notion of built-in adaptations and inclusive accommodations from architectural space to the educational milieu. One of the initiatives cited in this brief was the Center for Applied Special Technology (CAST), a not-for-profit organization founded in 1984 that promotes the uses of technology to expand opportunities for all people, especially those with disabilities (CAST, 2004a). The work of CAST is grounded in *Universal Design for Learning* (UDL), an approach to planning and developing curricula in ways that promote access, participation, and progress in the general education curriculum for all learners (CAST, 2006). CAST has articulated three essential qualities of UDL: (a) curriculum that provides multiple means of representation; (b) curriculum that provides multiple means of expression; and (c) curriculum that provides multiple means of engagement (CAST, 2004d). With a focus on the goal of universally designed curriculum, CAST is developing and exploring new digital multimedia learning tools that teachers can use in an approach to teaching that is designed to address the heterogeneity in abilities and learning styles among students. Examples of the tools and resources developed by CAST include *eReader*, a literacy support software package that can combine electronic text from any source with reading supports (such as spoken text and visual highlighting) to make the information accessible to users of all abilities (CAST, 2004b). With its primary focus on K–12 students, CAST has also developed teaching handbooks, practical guides that provide teachers with ideas about ways to integrate universally designed learning tools and strategies into the curriculum.

Another initiative of CAST is based on a collaborative agreement with the U.S. Department of Education's Office of Special Education Programs (OSEP) to establish a National Center on Accessing the General Curriculum. This center and its five partners are charged with the goal of providing a vision of how new curricula, teaching practices, and policies can be woven together to create practical approaches for improved access to the general curriculum for students with disabilities (CAST, 2004c). Work is progressing to support a strategic research program to synthesize existing knowledge, to evaluate policies affecting access to the general education curriculum, and to plan and implement national leadership and dissemination activities.

Universal Design for Instruction. At the postsecondary level, several initiatives based on UD have been launched. Building on the preliminary notion of applying UD to the instructional design process (Universal Instructional Design [UID]) proposed by Silver, Bourke, and Strehorn (1998), the Center on Postsecondary Education and Disability (CPED) at the University of Connecticut is developing and researching the concept of *Universal Design for Instruction* (UDI) with the support of two federal grants from the U.S. Department of Education, Office of Postsecondary Edu-

cation. UDI is 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; Scott, McGuire, & Foley, 2003). The focus of the CPED's work is to explore ways, and develop resources that college faculty can use, to ensure educational access for college students with cognitive disabilities. In establishing the foundation for UDI, a comprehensive review of the literature on UD, effective instruction in higher education, and effective instruction with students with learning disabilities in both secondary and postsecondary settings was conducted. This process led to the articulation of the *Principles of Universal Design for Instruction©*, the underlying tenets for the CPED's work with college and university faculty (see Table 1; Scott, McGuire, & Shaw, 2001). These principles are intended as a framework to guide faculty in reflective practice, rather than as a rigid procedure or prescription for instruction. UDI operates on the premise that the planning and delivery of instruction as well as the evaluation of student learning outcomes can incorporate inclusive attributes that anticipate diversity in learners without compromising academic standards.

Recognizing that faculty are first and foremost content experts, and that they rarely receive training in pedagogy (Weimer, 1990), UDI represents an emerging pedagogical model in which faculty are encouraged to reflect on their instruction and to proactively build in inclusive instructional features using the nine *Principles of Universal Design for Instruction©*. To support faculty in this process, a Web site has been developed that contains resources and information about UDI that faculty around the world can access online (Facultyware; http://www.facultyware.uconn.edu). This site hosts a growing repository of high-quality instructional products submitted by college faculty from diverse academic disciplines and across the country and selected for publication on the Facultyware site through a peer review process. Instructional tools that are rated of high quality and reflective of the *Principles of Universal Design for Instruction©* are showcased on the site and are available as freeware for other faculty. Currently, UDI is under examination by a small cadre of postsecondary learning communities as part of the CPED's ongoing work to investigate the concept. Through collaborative partnerships between CPED and selected universities and colleges, UDI learning communities of faculty, disability service providers, faculty development professionals, and administrators are identifying areas of interest relating to UDI, developing goals as part of an action plan, implementing UDI in courses, and gathering feedback on the application of UDI principles (Scott & McGuire, 2003). Although change evolves slowly in postsecondary settings and there is no legal mandate regarding access to the curriculum, UDI is viewed as a tool for reflective practice that can lead to more inclusive instruction in an increasingly diverse population of college students (Scott & McGuire, 2005; Scott, McGuire, & Shaw, 2003).

TABLE 1. 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 the 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.

Universal Instructional Design. Another application of UD 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" (http://www.tss.uoguelph.ca/uid/uidintro.html). UID principles represent the restatement of the NCSU's UD principles to relate them to educational environments. This project focused on two key objectives: (a) to enhance student learning through the application of the seven principles of UID throughout courses in this project, and (b) to conduct research studies that assess the impact of the level of UID on student learning. All faculty teaching in the distributed computing program in the Fall 2002 and Winter 2003 semesters participated. Faculty received feedback from students in each course and from the UID project manager and, where possible, modified their teaching or made a commitment to doing so in future courses. Although funding for this project ended in the fall of 2003, information on the project Web site indicated that a preliminary analysis of the research data showed a significant relationship between the level of UID in a course and the students' sense of self-efficacy. Resources on the Web site include case studies of faculty involved in the project.

Other Applications of UD

Other applications of universal design abound. Bowe (2000) has applied the seven UD principles from NCSU to education, terming this approach *Universal Design for Education* (UDE). He offered examples of ways in which universally designed education can be implemented in the pre-K–12 system, in colleges and universities, and in continuing and adult education. Bowe concluded that emerging technologies will

have a significant effect on the learning environment and encouraged educators to embrace divergences in learning style, planning for inclusion "by taking a few fairly simple steps in advance" (p. 107).

The work of Kame'enui and Carnine (1998) at the University of Oregon has identified universal access principles for the design of curriculum within the K–12 system. The National Center to Improve the Tools of Educators (NCITE; http://idea.uoregon.edu/~ncite/) has focused on ways to improve student learning outcomes by the implementation of effective instructional strategies across content and skill areas. The literature base on technology and special education is expanding, with UD emerging as a dominant theme in an intensive content analysis study of articles published in 2001 (Edyburn, 2002). UD principles are also being applied in the area of technology and telecommunications. The TRACE Research and Development Center at the University of Wisconsin (http://trace.wisc.edu/about/) is currently working on ways to make standard information technologies and telecommunications systems more accessible and usable by people with disabilities.

Large-Scale Assessment. With the escalating emphasis on outcomes-based measures, large-scale assessments are used at the local, state, and national levels to determine students' progress in achieving content standards (Thompson, Johnstone, & Thurlow, 2002). As noted by Thompson et al. (2002), the concept of UD applied to assessment presents an opportunity for test publishers to ensure that assessments are developed from the beginning to be accessible to the diverse students in today's schools, including those with disabilities and those with limited English proficiency. Thompson et al. (2002) explained that "universally designed assessments are designed and developed from the beginning to allow participation of the widest possible range of students, and to result in valid inferences about performance for all students who participate in the assessment" (p. 6). The work of these authors and their colleagues at the National Center for Educational Outcomes has systematically related the notion of UD in assessment to the seven principles of UD delineated by NCSU (Center for Universal Design, 1997).

Web Accessibility. Finally, the application of UD to ensure Web accessibility is particularly germane to education because teachers in the K–12 system as well as college faculty are increasingly using technology in their instruction. Compliance with existing accessibility guidelines, such as Section 508 and the guidelines developed by the Web Accessibility Initiative, a working group of the World Wide Web Consortium (W3C) (http://www.w3.org/WAI/guid-tech.html) represents another application of UD that has implications across the educational spectrum.

The intent of this article is to provide an overview of emerging models of the applications of UD in educational environments. UD has, in some ways, become a buzzword, a bandwagon easily jumped on, given its intuitive appeal. Kauffman (2002) observed that "slogans often work against the acquisition of understanding" (p. 77) in describing the long-standing debate about full inclusion of students with disabilities in general education. The field of special education should heed this caution as it relates to the notion of universal design. Without empirical evidence and carefully designed approaches to the study of the outcomes of UD applied to educational environments, there is a danger of embracing the UD concept at the expense of a rigorously crafted agenda to examine its efficacy. The next section presents some of the questions surrounding the application of UD to educational environments.

DISCUSSION

Is UD a Viable Approach to Educational Reform?

The climate for change relating to the needs and outcomes of students with disabilities is imminent. Calls for reform in the field of special education resound across contexts and constituencies. Kuhn (1996) observed that the "failure of existing rules is the prelude to a search for new ones" (p. 68). The success in the physical design arena of embodying the socially desirable value system of creating inclusive environments provides tangible evidence of the potential of UD. But does this construct have relevance in cognitive areas of teaching and learning? How we address this question will affect the potential of UD to provide the field with new approaches and insights. Claims about the efficacy of specific interventions and materials abound, yet complex problems are seldom solved without scrupulously examining the critical questions. The opportunity for leaders to proactively plan a research agenda must be embraced if the problems observed by the Institute of Education Sciences (U.S. Department of Education, 2003) are to be avoided: "Practitioners have seen interventions, introduced with great fanfare as being able to produce dramatic gains, come and go over the years, yielding little in the way of positive and lasting changes" (p. iii).

What Are Reasonable Expectations and Outcomes of UD in Education?

In the field's excitement about the possibilities of UD, extreme statements are often made, including such comments as "UD will address the needs of *all* students" or "UD will *eliminate* the need for special education services." However, looking back at the roots of UD in the physical realm is instructive. Architects and designers implementing UD do not make claims of creating totally inclusive products and environments. They speak of designing products that are

accessible to the greatest number of users. The Center for Universal Design focuses on "the design of products and environments to be usable by all people *to the greatest extent possible* [italics added] without the need for adaptation or specialized design" (Follette Story et al., 1998). Ronald Mace (1998) once noted that the use of the term *universal* is unfortunate in that "nothing can be truly universal; there will always be people who cannot use an item no matter how thoughtfully it is designed. However, we can almost always improve on the things we design to make them more universally usable" (p. 24). Although the field can likely benefit from the proactive approach and inclusive vision of UD, we must clearly articulate realistic expectations of this paradigm in educational settings. It is essential to work toward designing educational strategies, curricula, and assessment approaches that are as inclusive as possible for a wide range of students, but also to recognize that some students will still need individualized special education services and supports.

Can We Develop the UD Construct in a Rigorous Way?

Smith and Glass (1987) spoke of theory building as a research cycle, in which theory elaborates on a construct by specifying its component parts, allowing the researcher simultaneously to learn about the construct and to identify indicators to measure its validity. The fields of architecture and design have called for the development of a "critical theory" of UD (Welch, 1995) involving the testing of suppositions (i.e., UD principles), engaging in serious discourse and critical practice, implementing ongoing projects to document exemplars, and refining and validating the UD principles. In contrast to the quick solutions assumed to result from the application of UD to educational environments, this type of iterative theory building is essential to avoid the danger of yet another short-lived panacea for special education.

Collaboration Is Critical

The time is right for the field of special education to articulate a research 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. What areas are important for a research agenda on this construct? Some examples of queries that bear scrutiny follow:

- Are the components and principles of the proposed model valid?

- In what ways can the model be implemented in educational environments?

- What are the outcomes of interventions based on the model for students with and without disabilities?

- Are there differential effects of interventions based on variables such as learner and environmental attributes?

- Does UD reduce the need for specially designed instruction or the identification and placement of students with disabilities?

- What are efficient and effective approaches to prepare faculty, teachers, and preservice teachers to implement UD in their instruction?

- What do stakeholders perceive to be the benefits of instruction based on UD?

- What, if any, revisions to the model are warranted based on results from empirical studies?

A Word on Terminology

A perusal of the current literature that pertains to UD in educational settings quickly results in an "alphabet soup" jumble of terminology: UD, UDL, UDI, UID, UDE. In a recently reviewed manuscript, universal design underwent various linguistic permutations, including *universal design in education, universal access design, universal learner-centered approach for instruction, universal curriculum access,* and the more commonly used terms UDL and UDI. What difference does this variable terminology make in developing UD in educational settings? If the education field hopes to move this construct forward beyond intuitive applications, there must be a data-based foundation for examining the construct. Dubin's (1969) observation that "empirical analysis has meaning only by references to a theory from which it is generated" (p. 7) is particularly germane. Leaders in the development of UD in educational settings, including researchers and practitioners, must be intentional in their use of terminology, understanding which terms are linked to a theoretical model for the purpose of assessment, evaluation, and validation, and which terms reflect a befuddling use of adjectives with no specific meaning.

Implications for Practice

Although it is premature to promote UD as an effective model of inclusion, it is timely to iterate the question of alternative approaches to effective instruction. UD can foster the movement of the field beyond the notion of inclusion as a "place." Table 2 presents a framework for guiding the process of inquiry about important elements in addressing the instructional needs of students with disabilities. Under the current approach to special education services, students must be identified as having a disability in order to be eligible for individualized instruction. Based on such a legal model,

TABLE 2. A Framework for Considering Alternative Paradigms

Special education	Universal Design
Disability	
An abnormality or impairment that exists within the individual.	A component of human diversity and variation.
Eligibility	
Identify, test, and label individual students to document the presence of a disability and determine access to services.	Consider the learning needs of a broad range of students to inform instructional and curricular design.
Inclusion	
Include students with disabilities whenever appropriate in the general education curriculum.	Design instruction and curriculum to be inclusive of a wide range of learners.
Instruction	
Individually determined special education services are available only to eligible students.	Universally designed instruction is available to all students.
Accommodations and Modifications	
Available only for those students with documented disabilities.	Available to all students via alternative methods for accessing instruction and curriculum.
Assessment	
Asure that students with disabilities are included in high-stakes assessment.	Assure that standardized assessments are developed to be accessible to the widest range of students.
Resource Allocation	
Special education services are viewed as depleting general education resources.	Elements of Universal Design add value for a broader range of students.

Source: A Framework for Considering Alternative Paradigms, by Stan F. Shaw, Joan M. McGuire, & Sally S. Scott. Storrs: University of Connecticut, Center on Postsecondary Education and Disability. Copyright 2004. Reprinted with permission.

accommodations and instructional modifications are mandated solely for students with disabilities. As a result of the No Child Left Behind Act (2001), students with disabilities must be included in statewide testing programs unless the planning and placement team determines that the child requires an alternative assessment (Thurlow, Elliott, & Ysseldyke, 2003). Finally, under the current model of service delivery, tax dollars from federal, state, and local sources pay the cost of educating students with disabilities, with some people attesting to a belief that special education drains resources from the general education budget (Ysseldyke, Algozzine, & Thurlow, 2000).

In considering UD as an alternative paradigm for addressing the instructional needs of students with disabilities and those at risk for learning challenges, "disability" is viewed as a normal phenomenon of human diversity. Approaches to planning and delivering instruction and assessing learning emanate from a value system that anticipates diversity and builds in adaptations to meet the needs of the widest range of student "consumers." All learners, including those with disabilities, would have access to instruction and assessment that is flexible and adaptable. The general education classroom and curriculum would foster accessibility. This is the ideal of UD that is currently under develop-

ment and requires a significant research agenda before claims about its merit are warranted.

Conclusion

The education of students with disabilities is in an era of both challenge and opportunity. The 2004 reauthorization of the Individuals with Disabilities Education Improvement Act calls for significant changes in the way that special educators identify, assess, instruct, and evaluate students with disabilities. In this environment, it would be relatively easy for a model such as UD to be perceived as the latest "magic bullet." In fact, universal design is already being proposed as a synonym for effective instruction or inclusive instruction (Bremer, 2004). There is a danger because of the intuitive appeal of UD: Who would argue *against* an approach that anticipates diversity and proactively builds in features to accommodate the range of human diversity, whether it be in diverse needs for accessing physical spaces or in diverse needs relating to learning and instruction? We are advocates for the implementation and evaluation of UD in schools, and we urge federal, state, and private funding agencies to support extensive demonstration, evaluation, and research projects to allow this potentially powerful model to be developed

and proven *before* it is widely—and possibly ineffectively—implemented. ∎

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