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# Universal Design for Learning, Access to the General Education Curriculum and Students With Mild Mental Retardation

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Promoting student access to the general education curriculum remains a focus of the 2004 reauthorization of the Individuals with Disabilities Education Act. This article examines educational practices that promote such access for students with mild mental retardation, overviews issues pertaining to the implementation of supplementary aids and services to achieve this outcome, introduces a planning process to assist individual educational program teams to better plan for access, and examines extant research pertaining to the degree to which students with mild mental retardation have such access.

The 1997 amendments to the Individuals with Disabilities Education Act (IDEA) introduced statutory and regulatory language pertaining to ensuring access to the general curriculum for students receiving special education services and required that the individualized education program (IEP) of all students receiving special education services include a statement on (a) how the student's disability affects involvement and progress in the general curriculum, (b) the program modifications or supports for school personnel that are provided for the child to be involved and progress in the general curriculum, and (c) the special education and supplementary aids and services provided to ensure a student's involvement in and progress in the general curriculum. IDEA defines special education as specially designed instruction, and supplementary aids and services as "aids, services, and other supports that are provided in regular [general] education classes or other education related settings to enable children with disabilities to be educated with non-disabled children to the maximum extent appropriate" (IDEA, 2004; Sec. 602, 20 U.S.C. 1401, 33). The intent of these mandates was to align practice in special education with school reform efforts in general education, efforts that have been codified in the No Child Left Behind Act.

The 2004 amendments to IDEA continued these IDEA 1997 requirements and extended them, mandating that schools ensure that the IEP team includes someone

knowledgeable about the general education curriculum and that it meet at least annually to address any lack of expected progress in the general education curriculum. Finally, the proposed regulations to IDEA 2004 (issued in June 2005) prohibit a student with a disability from being removed from the general education setting based solely on needed modifications to the general education curriculum. The general education curriculum is defined as the same curriculum as that provided to students without disabilities and, in practice, is defined by the academic content and student performance standards in each state mandated by No Child Left Behind Act. It is evident, thus, that promoting student access to, and progress in, the general education curriculum remains a focal point of federal policy and national school reform efforts impacting students with disabilities.

We have been engaged in research and model development efforts to conceptualize access to the general curriculum for students with mental retardation (e.g., Wehmeyer, Lance, & Bashinski, 2002; Wehmeyer, Lattin, & Agran, 2001), and this article gives an overview of these efforts.

## PROMOTING ACCESS TO THE GENERAL EDUCATION CURRICULUM

As noted, IDEA requires that the IEPs of all students with disabilities identify the special education and supplementary aids and services provided to ensure a student's involvement in and progress in the general education curriculum. The main focus of this article is these special education and supplementary aids and services, but it is important to note at the onset that access to the general education curriculum begins with the development of standards and the design of curriculum as linked to those standards. Obviously if the curriculum is intended to be aligned with standards, it is important that such standards ensure accessibility. The Committee on Goals 2000 and the Inclusion of Students with Disabilities (1997) analyzed the policy frameworks undergirding the implementation of standards-based reform with students with disabilities and recommended several ways to set standards to make them defensible for use with students with disabilities. Such a process would need to consider if (a) content standards represent skills critical to the student's success once he or she leaves school, (b) content standards represent critical skills appropriate for the age of the student, and (c) the curriculum designed from the standards can be fully taught to students with disabilities without jeopardizing their opportunity to master other critical, functional behaviors (Committee on Goals 2000, 1997).

Further, if students with widely varying skills, backgrounds, knowledge, and customs are to progress in the general education curriculum, the standards on which the curriculum is based, as well as the curriculum itself, must embody the principles of universal design, as discussed subsequently, and be written to be open-ended not close-ended (Wehmeyer, Sands, Knowlton, & Kozleski, 2002). The terms *open-ended* and *close-ended* refer to "the amount of specificity and direction provided by curriculum standards, benchmarks, goals, or objectives at both the building and classroom levels" (Wehmeyer, Sands, et al, 2002, p. 126). Close-ended standards are specific and require narrowly defined outcomes or performance indicators. Open-ended standards do not restrict the

ways in which students exhibit knowledge or skills and focus more on the expectations that students will interact with the content, ask questions, manipulate materials, make observations, and then communicate their knowledge in a variety of ways.

The Committee on Goals 2000 (1997) agreed that all students should have access to challenging standards and that there is merit to an accountability system that includes students with disabilities but warned that states and localities must “design their common content standards, performance standards, and assessment to maximize participation of students with disabilities” (p. 197). The Committee’s final recommendation was that the IEP process should be strengthened to become the formal mechanism for deciding how individual students with disabilities participate in standards-based reforms. Such a process is described subsequently.

## Universal Design for Learning

Given then that standards are written and the curriculum designed so as to ensure access for students with mild mental retardation, we turn to instructional design and implementation issues—that is, the special education and supplementary aids and services provided to ensure involvement and progress in the general curriculum. Turnbull, Turnbull, and Wehmeyer (2007) identified six domains (see Table 1) pertaining to supplementary aids and services, all of which, at one level or another, are important to ensure access. The first such domain involves ensuring that curricular materials embody the principles of universal design for learning (UDL).

Orkwis and McLane (1998) defined UDL as “the design of instructional materials and activities that allows the learning goals to be achievable by individuals with wide differences in their abilities to see, hear, speak, move, read, write, understand English, attend, organize, engage, and remember” (p. 9). Rose, Meyer, and Hitchcock (2005) suggested three essential qualities of universally designed curricular materials: that the curriculum is designed to (a) provide multiple representations of content, (b) provide multiple options for expression, and (c) provide multiple options for engagement. These three qualities are discussed in the following.

*Multiple means of representation.* Universally designed materials provide content information in multiple and flexible formats. If the sole means of content representation is a printed text, then content information is unavailable to a student who cannot read, cannot read the language in which the book is printed, or cannot see. Increasingly, digital or electronic formats for texts are being used to provide flexibility in such content representation. Digital talking books and similar electronic text formats can take information provided in a digital file and render that content information in multiple formats, including text with digital magnification or image contrasting, text to speech with synchronized text highlighting, electronic Braille, English to foreign language conversions (and back), and even an avatar that can represent the information in American sign language. The players that convert the digital text to these varied formats operate like a Web browser and are menu-driven such that the same digital or electronic

TABLE 1  
Supplementary Aids and Services

<i>Domain</i>	<i>Definition</i>	<i>Examples</i>
Universal design for learning	Modifications to how curriculum is presented or represented or how students respond to the curriculum	Digital talking book formats, advance organizers, video or audio input or output
Access	Modifications to the community, campus, building, or classroom to ensure physical and cognitive access	Curb cuts, wide doors, clear aisles, nonprint signage
Classroom ecology	Modifications to and arrangements of features of the classroom environment that impact learning	Seating arrangement, types of seating, acoustics, lighting
Educational and assistive technology	Technology that reduces the impact of a person's impairment on his or her capacity	Calculator, computer, augmentative communication device
Assessment and task modifications	Modifications to time or task requirements (but not content or material) to assist in participation in assessment or educational task	Extended time, scribe, notetaker, oral presentation
Teacher, paraprofessional, or peer support	Support from another person to participate in instructional activities	Peer buddy, paraeducator, teacher

file and media player (software) can provide access to students who cannot read, have difficulty seeing, use English as a second language, are deaf, or experience any of a myriad of other barriers to accessing content.

Although digital text formats will be more widely available in time, the World Wide Web provides the means to provide multiple representations now. One of the benefits of the Web over traditional media is the capacity to use graphic images in a variety of ways, from icons to hyperlinked pictures to streamed video. However, for a person who is blind or visually impaired and who is using a text-reader to access the site, graphic depictions may make the site and the information contained therein inaccessible. Alternatively, accessible Web sites can include text descriptions of images. Similarly, the design of curricular materials should include multiple representations of important topics, features, or points. Students with mental retardation, for example, need print-based information presented with graphic depictions, free from unnecessary clutter and with key information repeated or highlighted.

*Multiple means of expression.* Just as content information provided to students must be presented in multiple formats, so too must universally designed materials provide learners multiple ways to demonstrate what they know. There are a variety of ways of student responding that could indicate progress, including artwork, photography,

drama, music, animation, and video that enable students to express their ideas and their knowledge. Once again, technology promises to provide avenues for expression that have heretofore been unavailable.

*Multiple means of engagement.* By the utilization of multiple representation and engagement modes, particularly those that involve digital representation of content, that are graphically based and incorporate video, audio, and other multimedia components, student engagement, and as such student motivation, can be enhanced. Universally designed curriculum accounts for student interest and preferences and individualizes representation, presentation, and response aspects of the curriculum delivery accordingly. Current technologies allow that level of individualization and, thus, provide greater flexibility in ways that students can engage in learning and ways that tap into learners' interests, offer appropriate challenges, and increase motivation.

Universal design should be distinguished from simply using assistive technology to provide access to the general curriculum for students with mental retardation. The use of assistive technology comes after curriculum materials have been made and, in most cases, after teachers have planned instruction. The major advantage to UDL is that it takes place before materials are made and teachers decide how to teach. Access is built in from the beginning, thus eliminating the need for many time-consuming adaptations or purchase of expensive assistive technology devices (Bowe, 2000).

Wehmeyer, Sands, et al. (2002) suggested that these qualities of universally designed materials comprise one component of the types of educational efforts required to ensure access to the general curriculum for students with mental retardation. Rose and colleagues (2005) focused on the role of technology to create universally designed materials, but there are also instructional and nontechnology-based actions that can achieve greater access. These were referred to by Wehmeyer et al as "curriculum adaptations" and "curriculum augmentations."

## Curriculum Adaptations

Curriculum adaptations refer to those qualities of universal design identified by Rose and colleagues (2005) and include efforts to modify the representation of the curriculum content or to modify the student's engagement with the curriculum to enhance access and progress. The previous section discussed how technology can enable educators to ensure multiple means of representation and engagement, but there are a number of instructional strategies that have had varying degrees of utilization with students with mild mental retardation that achieve the same end.

An often-noted curriculum adaptation involves the use of advance organizers. An advance organizer is "an introduction presented to learners before the material to be taught containing an overview of the structure of the unit and creating a connection between the new material to be learned and information already learned" (Peleg & Moore, 1982, p. 621). There are only a few studies of the efficacy of advance organizers with students with mental retardation with mixed, though promising, results. For example,

Reis (1986) found that advance organizers using knowledge statements (defined concepts in the content in advance) and purposive statements (described what the student was supposed to listen for) improved comprehension performance of students with and without mental retardation, with all students performing better in the knowledge plus purpose statements condition than other conditions, though both the knowledge and purpose statement conditions were better than the no advance organizer condition.

Another curriculum adaptation similar to advance organizers is the graphic organizer. Graphic organizers are “visual displays teachers use to organize information in a manner that makes the information easier to understand and learn” (Meyen, Vergason, & Whelan, 1996, p. 132). They involve efforts to structure information or arrange important aspects of a concept or topic into a pattern using graphic modalities (Bromley, Irwin-DeVitis, & Modlo, 1995). Flow charts, semantic maps, webs, and Venn diagrams are all examples of graphic organizers.

Bulgren and Lenz (1996) identified a number of “teaching devices” (“an instructional technique or a tactic ... associated with facilitating organization and understanding, recalling and applying information” [p. 445]). These teaching devices included strategies such as presenting content through an outline, using a hierarchical graphic organizer, presenting information in tables, and using flowcharts and concept maps, all of which illustrate other types of curriculum adaptations.

## Curriculum Augmentations

A second curriculum modification involves the use of curriculum augmentations. Curriculum augmentations refer to efforts to augment or expand the curriculum to provide students with additional skills or strategies that enable them to succeed within the general curriculum. Again, there are multiple examples of curriculum augmentations.

For example, chunking is the process of creating units by combining elements that are related (Sylwester, 1999) and that are manageable to students. Chunking is a curriculum augmentation strategy in that students learn to “chunk” material to make it more manageable and to improve memory and recall. Chunking has been used as a teaching device in content enhancement for students with learning disabilities (Bulgren & Lenz, 1996) across multiple content areas. There have been limited applications to populations of students with mild mental retardation, but Lee and colleagues (in press) noted that given the well-documented difficulty students with mental retardation have with memory, chunking might be a useful means to enhance attention and memory by enabling them to chunk related parts into units that are meaningful to them.

Another example of curriculum augmentations suggested by Lee et al. (in press) as potentially beneficial for students with mental retardation involves the use of mnemonic strategies. Mnemonic strategies are systematic procedures for enhancing memory by providing effective cues for recall as a “cognitive cuing structure” such as word, sentence, or picture devices (Bellezza, 1981; Lombardi & Butera, 1998). This strategy is used mainly in developing better ways to encode new information for easier retrieval (Mastropieri & Scruggs, 1998). Mnemonic strategies are commonly divided into imagery

illustrations, such as pictures or diagrams, and word-based devices, using words to aid memory (Mastropieri & Scruggs, 1998). It is more effective, however, to integrate imagery illustration and word-based devices as opposed to using them separately.

A third category of curriculum augmentations involves the implementation of student-directed learning strategies, such as antecedent cue regulation, self-instruction, self-monitoring, self-evaluation, and self-reinforcement. Student-directed learning strategies (Agran, King-Sears, Wehmeyer, & Copeland, 2003) enable students to learn to direct their learning and self-regulate problem solving geared toward learning (Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000). Teaching students such strategies has multiple benefits, including promoting inclusion, self-determination, and self-regulated learning (Agran et al., 2003). There is now a fairly robust body of literature documenting the positive impact of promoting student-directed learning on positive outcomes for children and youth with mental retardation (Agran et al., 2003) and an emerging database suggesting that such strategies result in enhanced access to the general curriculum (Palmer, Wehmeyer, Gipson, & Agran, 2004; Wehmeyer, Field, Doren, Jones, & Mason., 2004).

### Planning to Achieve Access to the General Education Curriculum

The Committee on Goals 2000 (1997) recommended that the IEP process be strengthened to become the formal mechanism for deciding how individual students with disabilities participate in standards-based reforms. Figure 1 depicts a process by which this can occur for students with mild mental retardation. The process presumes that IEP team members (or at least some) know what is in the general curriculum and what unique learning needs the student may have. The first step the team should consider would be what supplementary aids and services might enable the student to progress in the general curriculum. In this article, I have focused primarily on supplementary aids and services in the domain of UDL, but as can be seen from Table 1, there are others, including physical access issues, classroom ecological variables, educational and assistive technology, assessment and task modifications, and teacher, paraprofessional or peer supports that also should be considered if necessary to ensure student progress.

The model depicted in Figure 1 explicitly identifies two supplementary aids and services (i.e., UDL and assistive and educational technology) because the former is critical to student access and the latter is one of the special factors IDEA requires teams to consider. IEP teams are then directed to consider the types of specially designed instruction (e.g., special education services) students will need to acquire content knowledge. Space limitations prohibit an extensive discussion of these, but they are practices of which most educators working with students with intellectual disabilities are familiar, including differentiated instruction, scaffolding, cooperative learning, and other inclusive practices, as well as high quality content-specific strategies such as direct instruction, behavioral interventions, and other modes of instruction. Only after considering all of these does the team turn to other educational needs, which would include content not included in the general education curriculum and then related service needs.



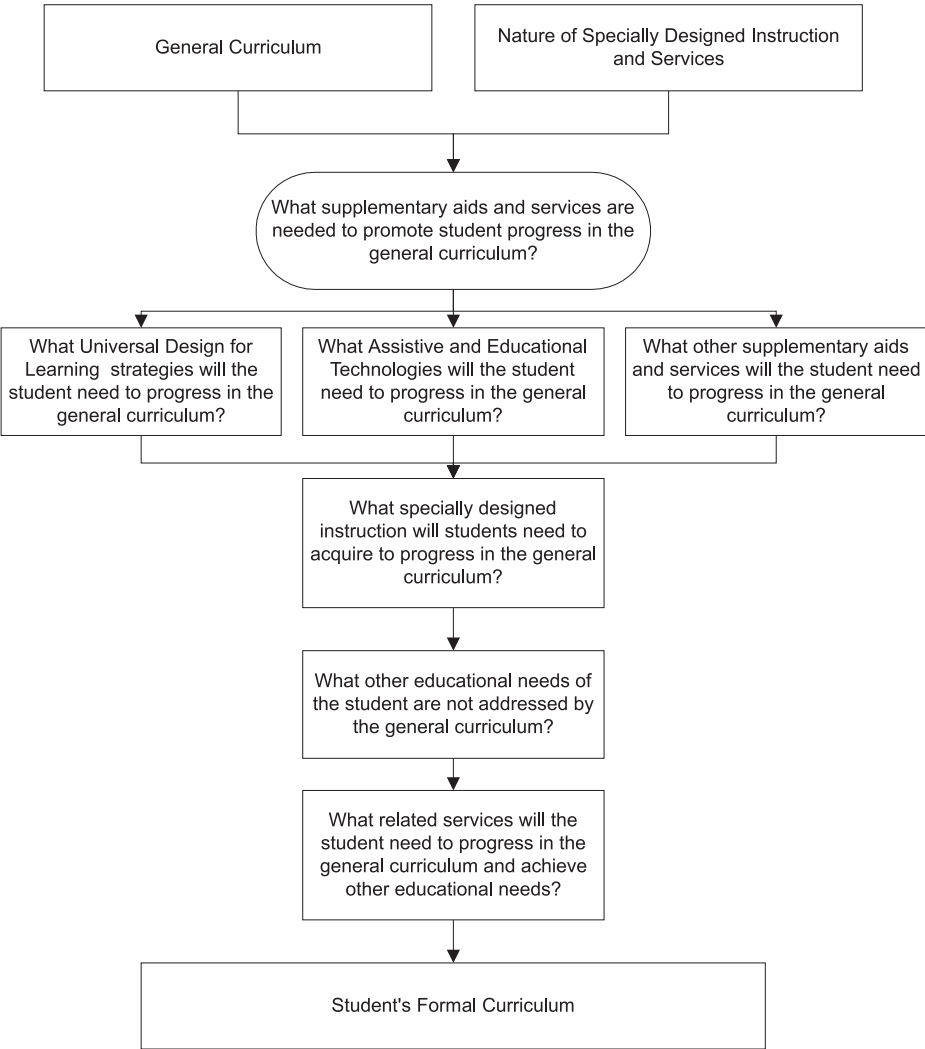


FIGURE 1 IEP team decision-making process to promote student progress in the general education curriculum (Adapted and modified from Wehmeyer, Lattin, & Agran, 2001).

DISCUSSION

By way of conclusion, instead of simply reiterating what has been detailed in the previous sections of this article, it may be more useful to consider where we are with regard to educational planning and decision making that conforms to the previously mentioned recommendations. Researchers have conducted two observational studies that provide a

“pulse-check” as to current status of access to the general curriculum for students with mild mental retardation. First, Wehmeyer, Lattin, Lapp-Rincker, and Agran (2003) conducted an observational study of 33 students with mild mental retardation to examine the degree to which they were involved in tasks related to the general curriculum by recording (a) whether a participant (e.g., the student with a disability being observed) was engaged in a task linked to any general education standard, (b) whether a participant was engaged in a task linked to a grade-level standard, (c) whether a participant’s peers were engaged in a task linked to any general education standard, (d) whether a participant’s peers were engaged in a task linked to a grade-level standard, (e) whether a participant was engaged in a task linked to an IEP goal, (f) whether accommodations were in place to support the student, (g) whether curriculum adaptations were provided, and (h) whether curriculum augmentations were observed. Students were observed in naturally occurring classroom contexts from 120 to 240 min, with an average of 202 min. Overall, almost 110 hr of observations were coded.

Results were encouraging with regard to the percentage of time students with mental retardation were engaged in a task related to a school district standard, either working on the same task as peers or on a task related to a different standard or benchmark (70% of intervals). This amount varied considerably by the students’ level of disability, with students with limited support needs (mild disabilities) engaged in a task linked to a standard in 87% of intervals and students with significant cognitive disabilities engaged in such a task 55% of the time. Students served in the general education classroom were observed working on tasks linked to a standard in 90% of intervals, whereas students served primarily in self-contained settings engaged in tasks related to a standard in only 50% of the observation intervals.

Overall, students were working on a task linked to an IEP in 22% of the intervals, were provided accommodations to work on a task linked to a standard 5% of the time, were working on an adapted task 3% of the time, and were being taught strategies to improve their capacity to engage with the general curriculum only 0.15% of the time. Moreover, there were significant differences by setting (inclusive or self-contained) in a number of areas. Students served in inclusive settings were significantly more likely to be working on a task linked to a standard, in general, and to be working on an adapted task. Students educated primarily in self-contained settings were significantly more likely to be working on a task linked to a standard below grade level or on a task not linked to a standard and to be working on a task linked to an IEP objective.

In a second study using a computer-based data collection system measuring the same variables, Soukup, Wehmeyer, Bashinski, and Bovaird (2005) examined the degree to which 19 late elementary age students with mild mental retardation had access to activities that could be linked to district standards in social studies and science and the degree to which such access was influenced by inclusion in general education, accommodations, and curriculum modifications. In 61% of the intervals ( $n = 3,420$  twenty-sec intervals), students’ activities could be linked to a grade-level standard and in an additional 20% of intervals could be linked to an off grade level standard. However, when examined based on how much time the student spent in the general education classroom, 83% of intervals for students in a high-inclusion group and 93% of intervals for

students in a moderate-inclusion group could be linked to grade-level standards, whereas none of the intervals for students in the low-inclusion group (e.g., self-contained classroom) were linked to grade-level standards (groups did not differ by level of impairment). In only 18% of the intervals was a curriculum adaptation in place to support a student, and there was no instance in which students were being taught learning-to-learn strategies and other strategies to enable them to interact with content.

Our conclusions from these studies were that students gain access to the general education curriculum in the general education classroom, that IEP goals were not, by and large, linked to the general education curriculum, and that too few curriculum adaptations and virtually no curriculum augmentations were being used. That this needs to change seems evident.

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